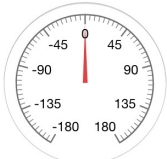


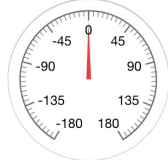
KLYS:LI10:21:SLED\_PHAS

SLED

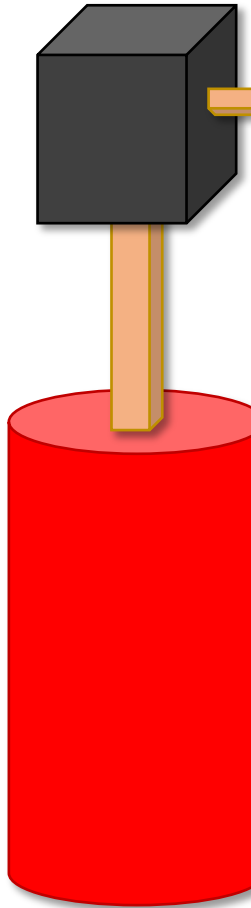
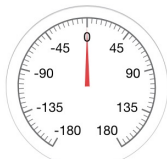


Waveguide

KLYS:LI10:21:PHAS



ACCL:LI10:21:PHASE\_WOCH6



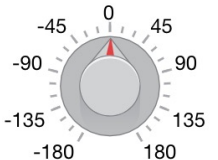
Klystron



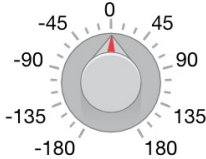
Gun



KLYS:LI10:21:SFB\_PDES



KLYS:LI10:21:PDES



As far as I can tell,  
KLYS:LI10:21:PHAS = KLYS:LI10:21:SLED\_PHAS

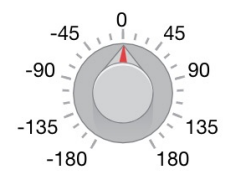
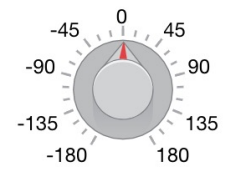
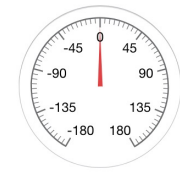
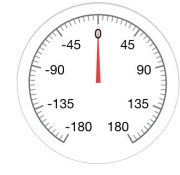
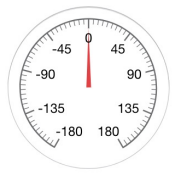
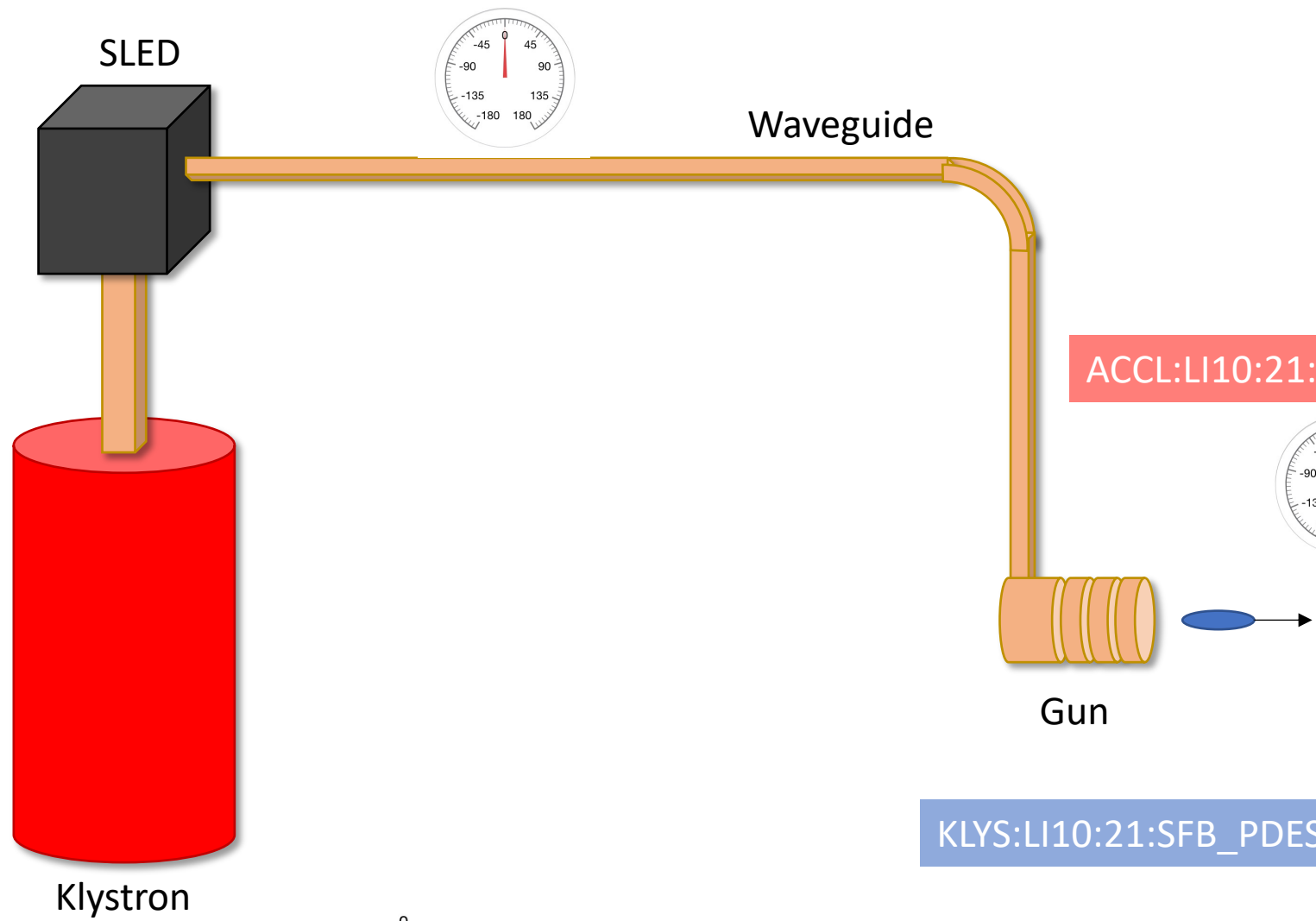
KLYS:LI10:21:SLED\_PHAS

KLYS:LI10:21:PHAS

ACCL:LI10:21:PHASE\_WOCH6

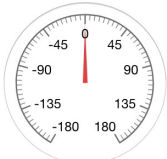
KLYS:LI10:21:SFB\_PDES

KLYS:LI10:21:PDES



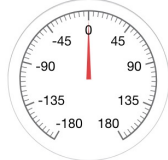
KLYS:LI10:21:SLED\_PHAS

SLED

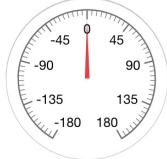


Waveguide

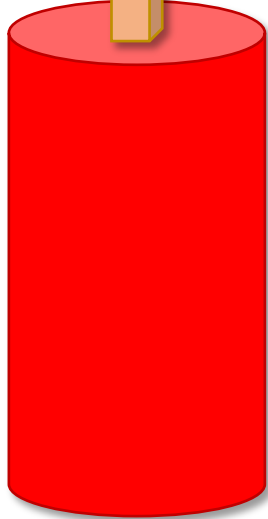
KLYS:LI10:21:PHAS



ACCL:LI10:21:PHASE\_WOCH6



Fast Feedback

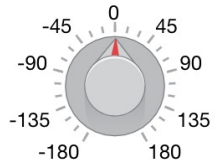


Klystron

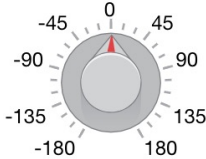


Gun

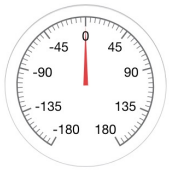
KLYS:LI10:21:SFB\_PDES



KLYS:LI10:21:PDES

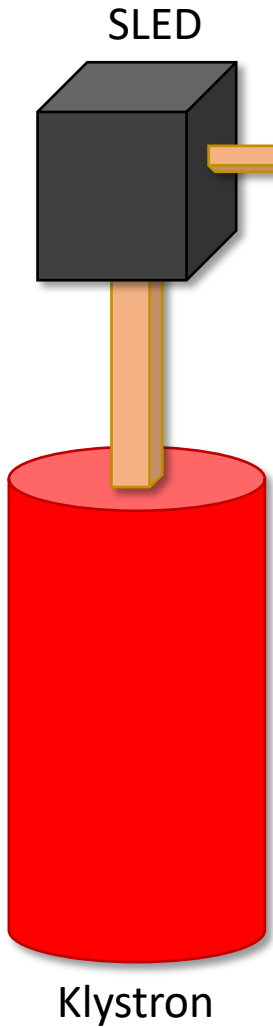
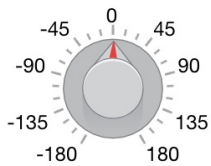


KLYS:LI10:21:PHAS

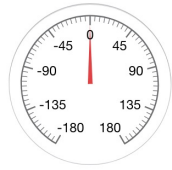


Fast Feedback

KLYS:LI10:21:PDES



KLYS:LI10:21:SLED\_PHAS

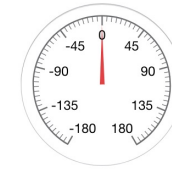


Waveguide

Phase drift with time/temperature

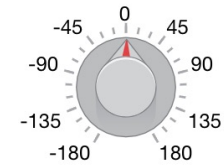
$$\Delta\phi(t)$$

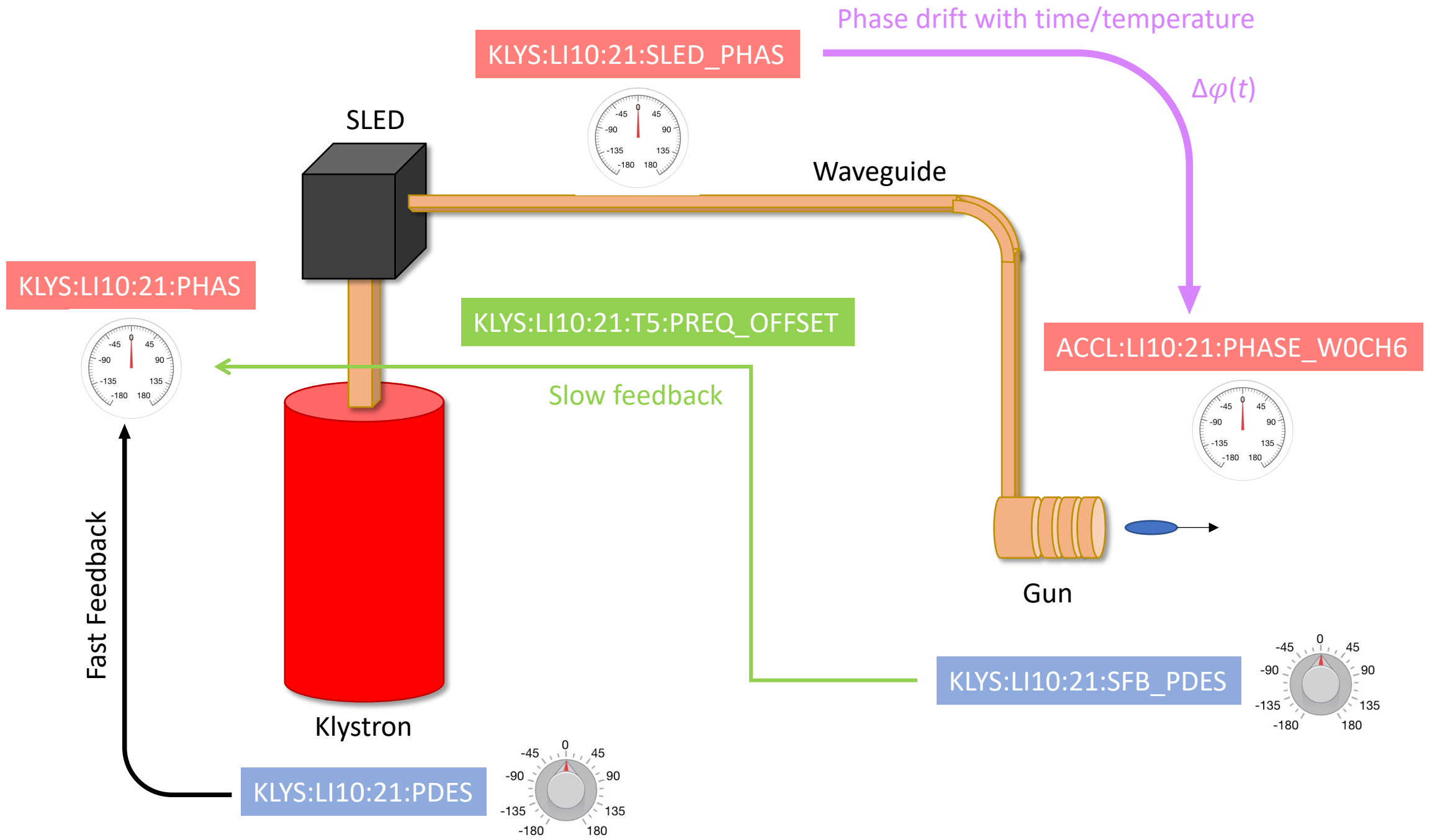
ACCL:LI10:21:PHASE\_WOCH6



Gun

KLYS:LI10:21:SFB\_PDES





# Fast Feedback Only

**Goal: Keep Klystron PHAS = PDES**

$$(KLYS:LI10:21:PHAS - KLYS:LI10:21:PDES) = 0$$

**Phase between output of klystron and input of gun changes with time:**

$$ACCL:LI10:21:PHASE\_WOCH6 = KLYS:LI10:21:PHAS + \Delta\varphi(t)$$

**Cannot keep phase at constant at gun!**

# Add Slow Feedback

**Goal: Keep phase at gun constant**

$$(\text{ACCL:LI10:21:PHASE\_WOCH6} - \text{KLYS:LI10:21:SFB\_PDES}) = 0$$

**Phase between output of klystron and input of gun changes with time:**

$$\text{ACCL:LI10:21:PHASE\_WOCH6} = \text{KLYS:LI10:21:PHAS} + \Delta\varphi(t)$$

**Slow feedback attempts to keep gun phase constant by adjusting offset.**

$$\text{ACCL:LI10:21:PHASE\_WOCH6} = \text{KLYS:LI10:21:PHAS} + \Delta\varphi(t) + \text{KLYS:LI10:21:T5:PREQ\_OFFSET}$$

**KLYS:LI10:21:PDES is not part of this calculation.**

# Ideas to Reduce Confusion

## 1. Set **KLYS:LI10:21:PDES = 0**

- Then **KLYS:LI10:21:T5:PREQ\_OFFSET = ACCL:LI10:21:PHASE\_WOCH6 - KLYS:LI10:21:PHAS**

## 2. Have the slowback feedback control PDES directly

- Then **KLYS:LI10:21:PDES = KLYS:LI10:21:PHAS**

In either case, it would be good to reset **KLYS:LI10:21:PDES = 0** initially to stay in +/- 180 degree range.