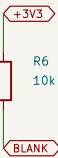
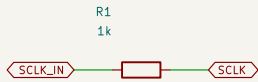
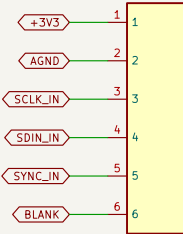


PRECISION X / Y SCAN | LOW-VOLTAGE MODULE

01 ESP32 SPI / BLANK

J1
ESP32 / CLEAN 3V3



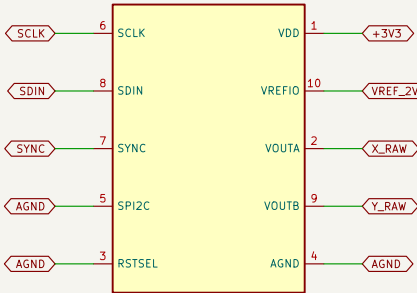
J3: external active-high blanking interface.
10k pull-up works only while module3V3 exists.
External interlock must hold blank if supply is lost.

J1: 1 clean3.3V IN; 2 GND; 3 GPIO18 SCLK;
4 GPIO23 MOSI; 5 GPIO27 SYNC; 6 GPIO25 BLANK.
SPI1MHz/moder1. Common3V3power domain; short leads.
Do not power this from the detector reference output.

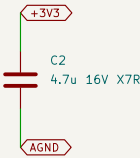
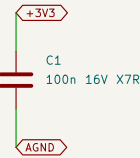
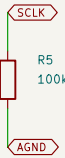
UNBUILT PROTOTYPE | No measured noise, linearity or beam-position accuracy.
Use precision Instruments for calibration; a nominal16bit code step is not imaging resolution.

02 16-BIT DAC

U1
DAC80502DRXT

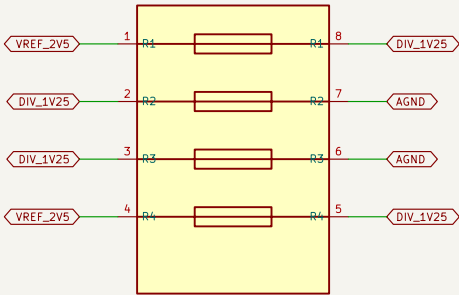


RSTSEL = GND: code zero at reset. At3.3V the DAC
reference divider MUST be configured before use.
Keep beam blank throughout power/reset/configuration.
No separate LDAC pin: GPIO26 remains unused.

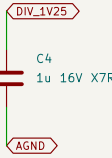


04 TRACKING CENTER REFERENCE

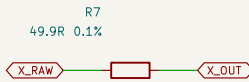
RN1
ACAS / 4x10k matched



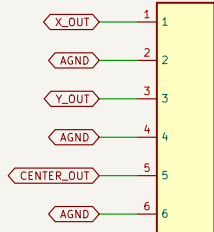
RN1: (R1 || R4) upper / (R2 || R3) lower
Vcenter = VREFIO / 2 =1.25V nominal
OPA333 feedback before R9; external load changes
connector voltage, so calibrate with actual amplifier.



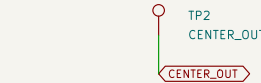
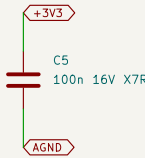
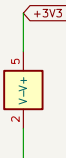
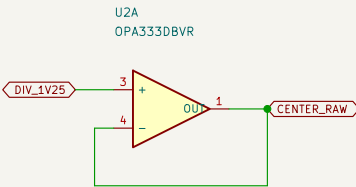
03 OUTPUTS TO EXTERNAL AMPLIFIERS



J2
ANALOG TO EXT AMPS



J2 only carries 0.25V X/Y and1.25Vcenter.
External difference amplifiers implement:
Vplate =100*(Vout - Vcenter), nominal example.
The amplifiers, their supplies, plates and independent
blanking hardware are NOT on this board.



Unbuilt engineering prototype / see ../README.md
LOW VOLTAGE ONLY – never connect to gun HV

DAC80502 precision scan module

Sheet: /
File: dac80502_scan.kicad_sch

Title: DAC80502 16-bit scan module / Rev A0

Size: A3 Date: 2026-09-11

KiCad E.D.A. 10.0.1

Rev: A0 – UNBUILT
Id: 1/1