Using the QA/QC Apps

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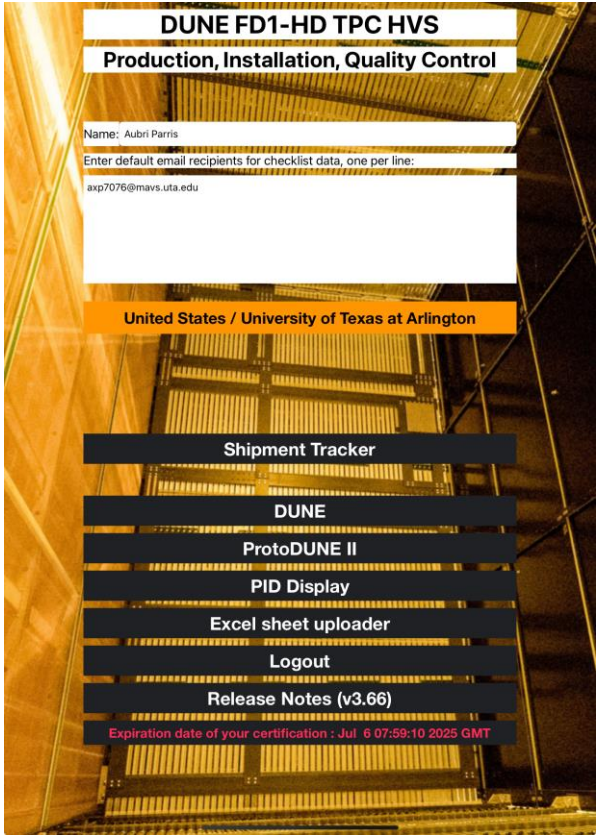
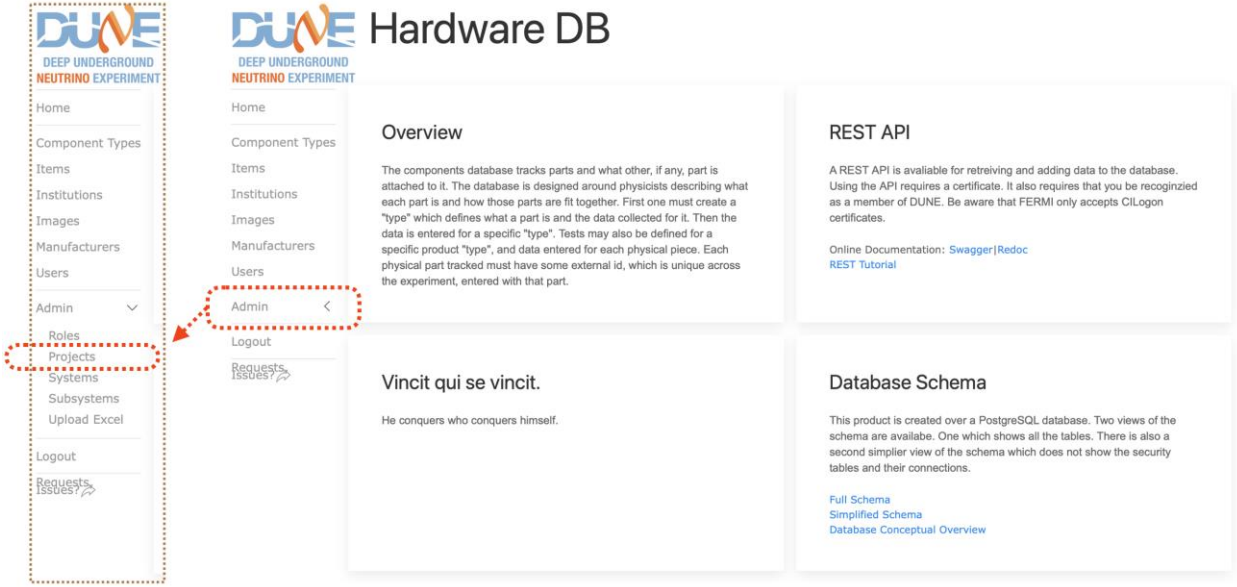
Introduction

- Two different apps able to upload to HWDB
  - One for Horizontal Drift
  - One for Vertical Drift
- Contains information on parts, QA/QC procedures, assembly, etc.
  - Also some basic info on ProtoDUNE II



The HWDB

- The Hardware Database shows information on all parts of the DUNE experiment
- Manufacturing
- Testing and QC
- PIDs (Part Identifiers)
  - Identifies all DUNE and LBNF components



Manufacturers: NONE
CERN
Grenoble

Factory: UT Arlington | UT at Minnesota

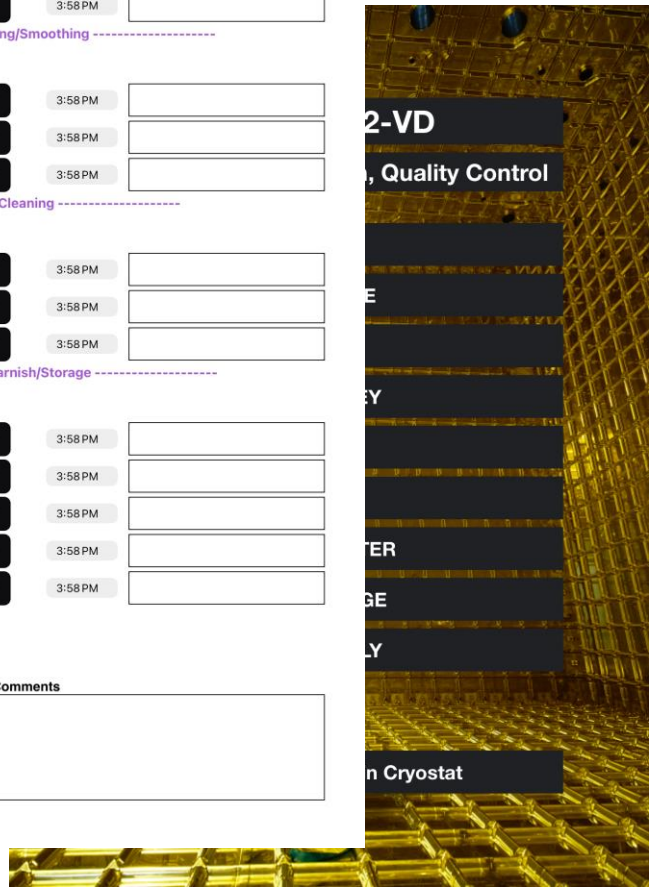
Date: Sep 19, 2024 3:58PM

Beam Drawings

Below, tap linked color words to see more detail descriptions.

	TYPE	PASS/FAIL	TIME	NOTE
1.	Straightness check	✗ ✓	3:58PM	
2.	Length Test	✗ ✓	3:58PM	
3.	Visual Inspection	✗ ✓	3:58PM	
	---------- Measurement ----------			
	Jigs and Inner Square Tests			
4.	JIG TEST - Main 10.2mm	✗ ✓	3:58PM	
	JIG TEST - Edge 10.2mm	✗ ✓	3:58PM	
	JIG TEST - Main 8.2mm	✗ ✓	3:58PM	
	JIG TEST - Edge 8.2mm	✗ ✓	3:58PM	
	JIG TEST - Main SH 3.5mm	✗ ✓	3:58PM	
	JIG TEST - Edge SH 3.5mm	✗ ✓	3:58PM	
	JIG TEST - Main 10.2mm&9.7mm	✗ ✓	3:58PM	
	JIG TEST - OFC Mount Holes	✗ ✓	3:58PM	
5.	Top Inner Square Test	✗ ✓	3:58PM	
6.	Bottom Inner Square Test	✗ ✓	3:58PM	
	---------- Sanding/Smoothing ----------			
	Sanding & Smoothing			
7.	With 600 grits	✗ ✓	3:58PM	
8.	With 1500 grits	✗ ✓	3:58PM	
9.	Visual inspection after sanding	✗ ✓	3:58PM	
	---------- Cleaning ----------			
	Cleaning			
10.	Outside	✗ ✓	3:58PM	
11.	Inside	✗ ✓	3:58PM	
12.	Visual inspection after cleaning	✗ ✓	3:58PM	
	---------- Dry/Varnish/Storage ----------			
	Dry, Varnish, & Storage			
13.	1st Coat of Varnish	✗ ✓	3:58PM	
14.	Drying (2 hours)	✗ ✓	3:58PM	
15.	2nd Coat of Varnish	✗ ✓	3:58PM	
16.	Drying (24 hours)	✗ ✓	3:58PM	
17.	Final Storage	✗ ✓	3:58PM	

Comments



Assembly Procedure

- Currently need an assembly procedure for the modules we'll be building today
  - Plan on using Brad's plan unless something changes
- PIDs for each RDB and termination board

Assembly Steps show less

Step	Picture	Discription	Checklist
1		Put the cart in horizontal position. Adjust the arms so that they have the right length and then fix the arms.	• Arms should be the right lengths according to the module type • All constraints are loose
2		Put I-beams on the cart. Check hinge/latch ends direction. Tighten the bars at both ends of the beams and use the small clamps on the cart to secure the beams. Make sure the teeth on the teeth bar is aligned with the holes on the beams.	• Teeth on the teeth bar should be aligned with the holes on the I-beams
3		Put one latch beam on each I-beam. Align the holes on the latch beam and the I-beam with screws. Use big clamp to fix the latch beams in place.	• Check correct latch beam orientation • Make sure the big clamps are not in the way of profiles
4	 	Put the teeth bar in vertical position. Wrap the profile holes on the latch beams with sheet protection. Inspect the profiles and put them on the cart. The profiles can be fully assembled before or after they are put on the cart. For the profiles on the latch beams, fully assemble the profiles after they go through the latch beam holes. Fasten the hinges of the cart to secure the profile.	• Profile visual inspection (assumed right length) • No deep and long scratches on the outer surface • Rivet holes on both ends • Not Curved or twisted • Clean surface • Profile nut and endcap visual inspection • No Structural damage • Clean surface • Profile assembly check • Exactly one profile with two profile nuts • Rivets are fully pushed
5.1		Tilt the cart to certain angle that one feels comfortable. Use fingers to adjust the position of the profile nut until the outer screw holes are aligned. Insert screw combination to the	• Screw and washers are not damaged • Screws are of the right length (20mm for profiles on the latch beams and 16mm for

Things to Add to FD2

- More details on some of the smaller parts
  - PPE gear, torque screwdriver details,
- Assembly and QC check post-assembly
- Structural inspection
  - Visual inspection after assembly
- Electrical continuity
  - Testing the resistance of the HVDB
    - Copper strips (?)
  - Brad mentioned using a multimeter
  - Old method: measured resistance between gap sites of each divider board

Electrical Inspection show less

Measure the resistance of each adjacent gap of the voltage divider boards on the module (57 profiles/module --> 56 measurements/module)

Note: RDB 1 is the closest to the CPA, while RDB 7 is the farthest from the CPA.

RDB 1

Gap site	Resistance (GΩ)
R1-R2	
R3-R4	
R5-R6	
R7-R8	
R9-R10	
R11-R12	
R13-R14	
R15-R16	

RDB 2

Gap site	Resistance (GΩ)
R1-R2	
R3-R4	
R5-R6	
R7-R8	
R9-R10	
R11-R12	
R13-R14	
R15-R16	

RDB 3

Gap site	Resistance (GΩ)
R1-R2	
R3-R4	
R5-R6	
R7-R8	
R9-R10	
R11-R12	

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