USB HUB BOX · PARTS

Boat 1 · A1a · v10.5 · plastic, beside Pi A · make and size not logged

A

gray plastic box

Box, plastic, with a plate
Built Oct 22, make and size not logged. Drawn about 10 x 8 x 4 in (a guess). No vent
1 · check: make, size

C



USB hub, StarTech USB210AIND
10 ports, 5 to 24 V in. 7.8 x 2.2 in, on standoffs
1 · have

D

white nylon posts, black zip ties

M3 nylon standoffs, zip ties
Hub off the plate; ties round the hub and across the plugs
1 · have

E

USB-A to USB-B cable

The hub's own USB lead
Detachable, USB-B at the hub. Out by S port a to Pi A USB 1
1 · have (with the hub)

F



AIS receiver, dAISy 2+
BNC antenna socket, mini USB. Always on
1 · have

G



AIS jumper, Superbat 1 ft
SO-239 to BNC. Keeps the coax weight off the dAISy
1 · have

H



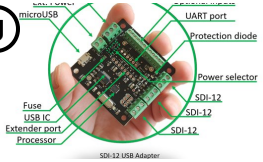
Wing reader, Waveshare 2-ch RS-485
Ch 1 tip meter, ch 2 compass. 120 ohm OFF
1 · check: no mail

I



Wing CAN adapter, DSD TECH SH-C30G
Trim actuator's own link. Isolated. 120 ohm ON
1 · have

J



SDI-12 USB adapter (LiuDr)
Reads the BaroVUE and HygroVUE. Top-left block: –, data, +
1 · have

K



SBE 45 cable, FTDI RS-232 (0 V version)
Chip in the USB plug. Bare end on to the wet lab box
1 · have

L



DO cable, FTDI RS-485
Chip in the USB plug. Bare end on to the wet lab box
1 · have

M



12 V converter, YRDZXG
24 to 12 V, potted. Weather sensors only
1 · have

N



Surge diode 1.5KE33CA
Across TB1-1 and TB1-2. Either way round
1 · have

O



DIN screw terminal blocks
TB1 9 and TB2 9, jumper bars, end plates
18 · count the kits

P



DIN rail, 35 mm
About 7.4 in. TB1, the reader, TB2
1 · have

Q



Split gland S, Altelix 5-port
Side wall. Ports a to e; plugs stay on
1 · have

R



Split gland B, Altelix 4-port
Bottom wall. Ports 2 to 5, bare ends
1 · have

U



Glands: PG7 (T), PG9 (1)
T the hub's 5 V lead. 1 the 24 V 16/2, sealant
2 · count

V



Wing cable, shielded Cat6
From the wing box. Solid 23 AWG: bare into TB2
1 · have (Mike's roll)

W

two Campbell sensors

BaroVUE 10, HygroVUE 10
Their own cables end on TB1. 12 V, SDI-12
2 · coming

X



Desiccant pack
Above the rail, clear of the plugs
1 · check shelf

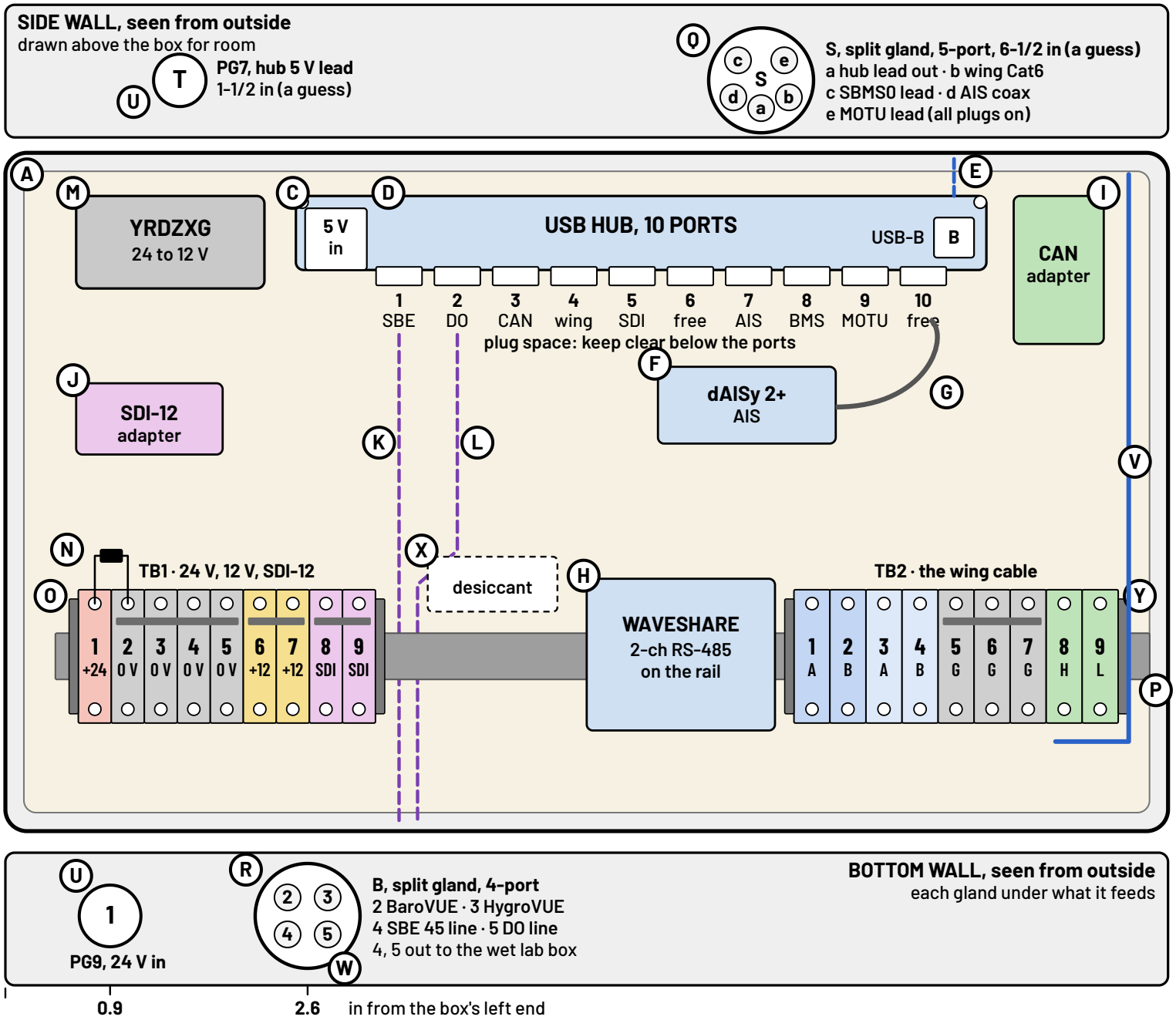
Y

ferrules, heat shrink, hookup wire

Ferrules, heat shrink, 22 AWG
Ferrule on every stranded end. Sleeve on the Cat6 shield
1 · have (kits)

USB HUB BOX · LAYOUT

lid off, looking in · not to scale (box as built not logged) · arrangement as the Oct 20 drawing



TB1

- **1** — +24 V in
- **2-5** — 0 V
- **6-7** — +12 V
- **8-9** — SDI-12 data

TB2

- **1-2** — tip meter A, B
- **3-4** — compass A, B
- **5-7** — ground
- **8-9** — actuator CAN H, L

Gray bar = bridged
Letters = page 1

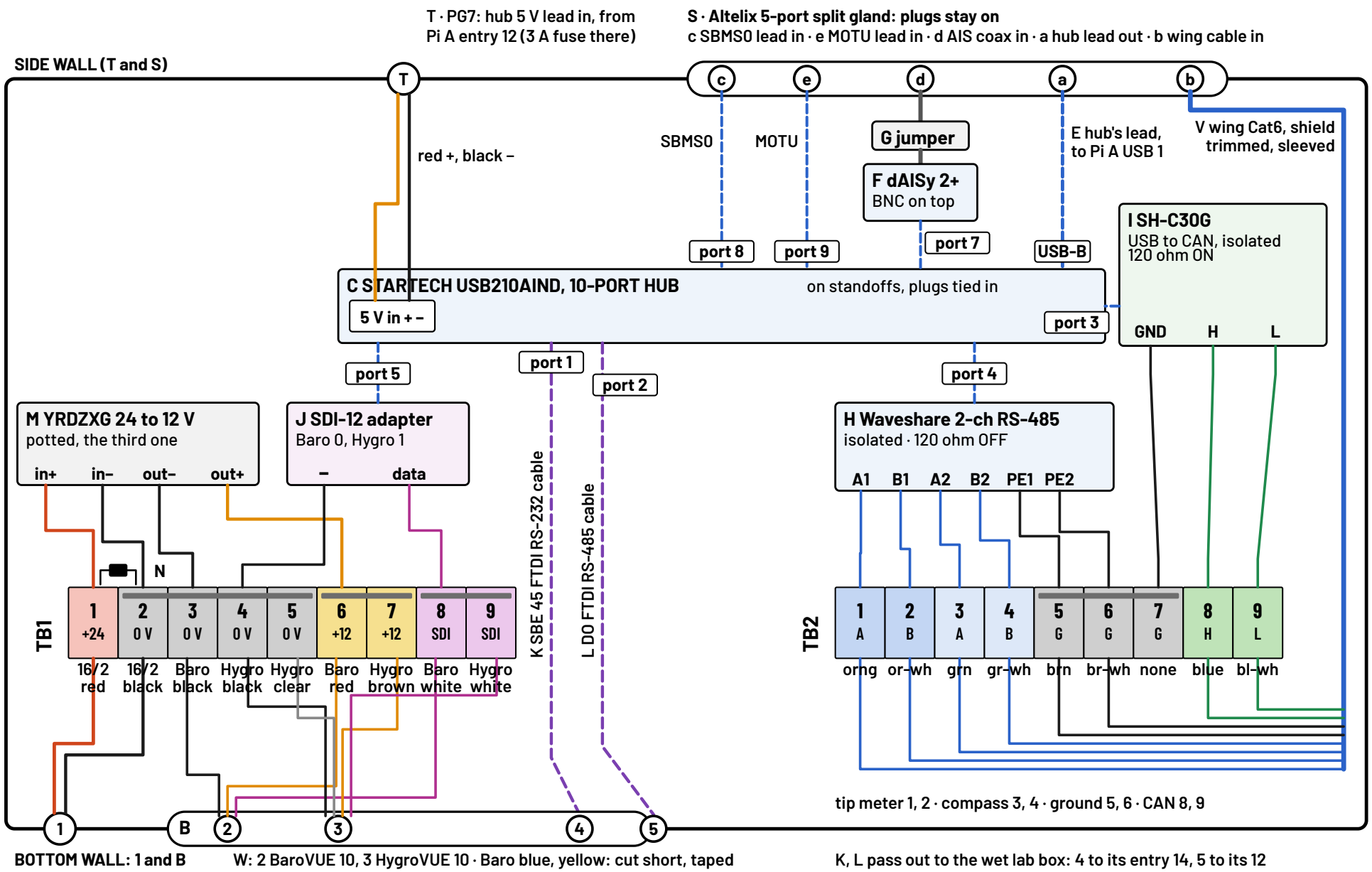
Hub ports 1 to 10:
Claude's pick; any port works (named by serial no.)

Not to scale:
parts where the Oct 20 drawing puts them. The hub alone is 7.8 in long, so the top row needs about 12 in inside (a guess).

Holes: T PG7 1/2 in, 1 PG9 5/8 in, S and B split glands 1-3/16 in. **No holes on top.**

USB HUB BOX · WIRING

numbers in boxes = terminal blocks, letters and numbers in circles = glands and ports · not to scale



24 V · 12 V, 5 V · 0 V · USB · RS-485 · CAN · SDI-12 · passing out · crossing with no dot = not joined

USB HUB BOX · EVERY WIRE

blocks numbered left to right as on pages 2 and 3

TB1: POWER AND SDI-12

b = bottom screw (gland side), t = top screw (hub side). Two wires on one screw share a double ferrule.

Block	Job	Wires
1	+24 V in	b: gland 1 red. t: converter red (in +), surge diode leg
2-5	0 V (bridged)	2b: gland 1 black. 2t: converter black (in –), surge diode leg. 3b: BaroVUE black. 3t: converter second black (out –). 4b: HygroVUE black. 4t: SDI-12 adapter –. 5b: HygroVUE clear shield
6-7	+12 V (bridged)	6b: BaroVUE red. 6t: converter yellow (out +). 7b: HygroVUE brown
8-9	SDI-12 (bridged)	8b: BaroVUE white. 8t: SDI-12 adapter data (S). 9b: HygroVUE white

TB2: THE WING CABLE

Block	Job	Wires
1	tip meter A	b: Cat6 orange. t: Waveshare A1
2	tip meter B	b: Cat6 orange-white. t: Waveshare B1
3	compass A	b: Cat6 green. t: Waveshare A2
4	compass B	b: Cat6 green-white. t: Waveshare B2
5-7	ground (bridged)	5b: Cat6 brown. 5t: Waveshare PE, ch 1. 6b: Cat6 brown-white. 6t: Waveshare PE, ch 2. 7t: SH-C30G GND
8	actuator CAN H	b: Cat6 blue. t: SH-C30G CAN_H
9	actuator CAN L	b: Cat6 blue-white. t: SH-C30G CAN_L

WIRE AND ENDS

Jumpers inside: 22 AWG hookup. Ferrule on every stranded end. The Cat6 is solid 23 AWG: bare into TB2, no ferrule, strapped within a few inches of the gland. Every USB plug clamped within 2 in and staked. Label both ends. Drip loop below every gland. No fuse in this box. Nothing goes to the lightning copper.

OFF THE RAIL

Part	Wires
Hub C	5 V + ← gland T red, – ← gland T black (read its terminal label). USB-B → its own lead E, out by S port a
Hub ports	1 SBE 45 cable K · 2 DO cable L · 3 SH-C30G · 4 Waveshare · 5 SDI-12 · 6 spare · 7 dAISy · 8 SBMS0 · 9 MOTU · 10 spare. Claude's pick: any port works. Every plug tied in and staked
YRDZXG M	red in ← 1t. black in → 2t. second black (out –) → 3t. yellow (out +) → 6t. Read the colors off its label
SDI-12 J	– → 4t. S (data) → 8t. + empty. Micro USB → port 5
Waveshare H	A1, B1 ← 1t, 2t. A2, B2 ← 3t, 4t. PE ch 1 → 5t. PE ch 2 → 6t. USB → port 4
SH-C30G I	CAN_H ← 8t. CAN_L ← 9t. GND → 7t. 5V0 empty. USB → port 3
dAISy F, jumper G	AIS coax PL-259 (S port d) → jumper SO-239; jumper BNC → dAISy. Mini USB → port 7. Tie the coax to the plate
Surge diode N	1.5KE33CA, one leg under 1t, one under 2t, legs short and sleeved. Either way round

BEFORE WIRING

YRDZXG bench-tested first (BOM). HygroVUE set to address 1 (send 0A1! to it alone) before it joins the BaroVUE. Waveshare: both 120 ohm jumpers OFF. SH-C30G: 120 ohm switch ON. SDI-12 adapter: power jumper as shipped, Ex. PWR empty. Each cable in a split gland port must be 0.15 to 0.30 in across (the Cat6 is 0.225 in). Weather sensor colors are Campbell's: read the cable labels.

CABLES IN, BY GLAND

Gland	Cable	Cores
T	hub 5 V lead	red → hub +, black → hub –. From Pi A entry 12 (3 A fuse there). Cable not named
1	24 V, 16/2	red → 1b, black → 2b. From line 12's 5 A breaker. Sealant in the gland
S a	hub's USB lead	out to Pi A USB 1 (Pi A entry S). No isolator
S b	wing Cat6	orange, orange-white → 1b, 2b. green, green-white → 3b, 4b. brown, brown-white → 5b, 6b. blue, blue-white → 8b, 9b. Shield trimmed flush, sleeved
S c, e	SBMS0, MOTU	plugs on, into ports 8 and 9
S d	AIS coax	PL-259 on, into the jumper G
B 2	BaroVUE 10	black → 3b, red → 6b, white → 8b. blue, yellow: cut short, taped
B 3	HygroVUE 10	black → 4b, clear → 5b, brown → 7b, white → 9b
B 4	SBE 45 line (K)	not landed here: orange TXD, yellow RXD, black GND, brown CTS, green RTS, red (no power). On to wet lab entry 14
B 5	DO line (L)	not landed here: orange A, yellow B, black GND, red 5 V out, brown, green (terminator). On to wet lab entry 12

STILL OPEN

The box's make and size (built, not logged). Where the two FTDI cables' grounds and spare cores land in the wet lab box. The hub 5 V lead's cable. The MOTU M2's own box. The HygroVUE's spot (a longer cable would change port 3). Line 12's stud: the end stud or stud 8.