Box wiring diagrams, v10.2: what is wired to what, and why

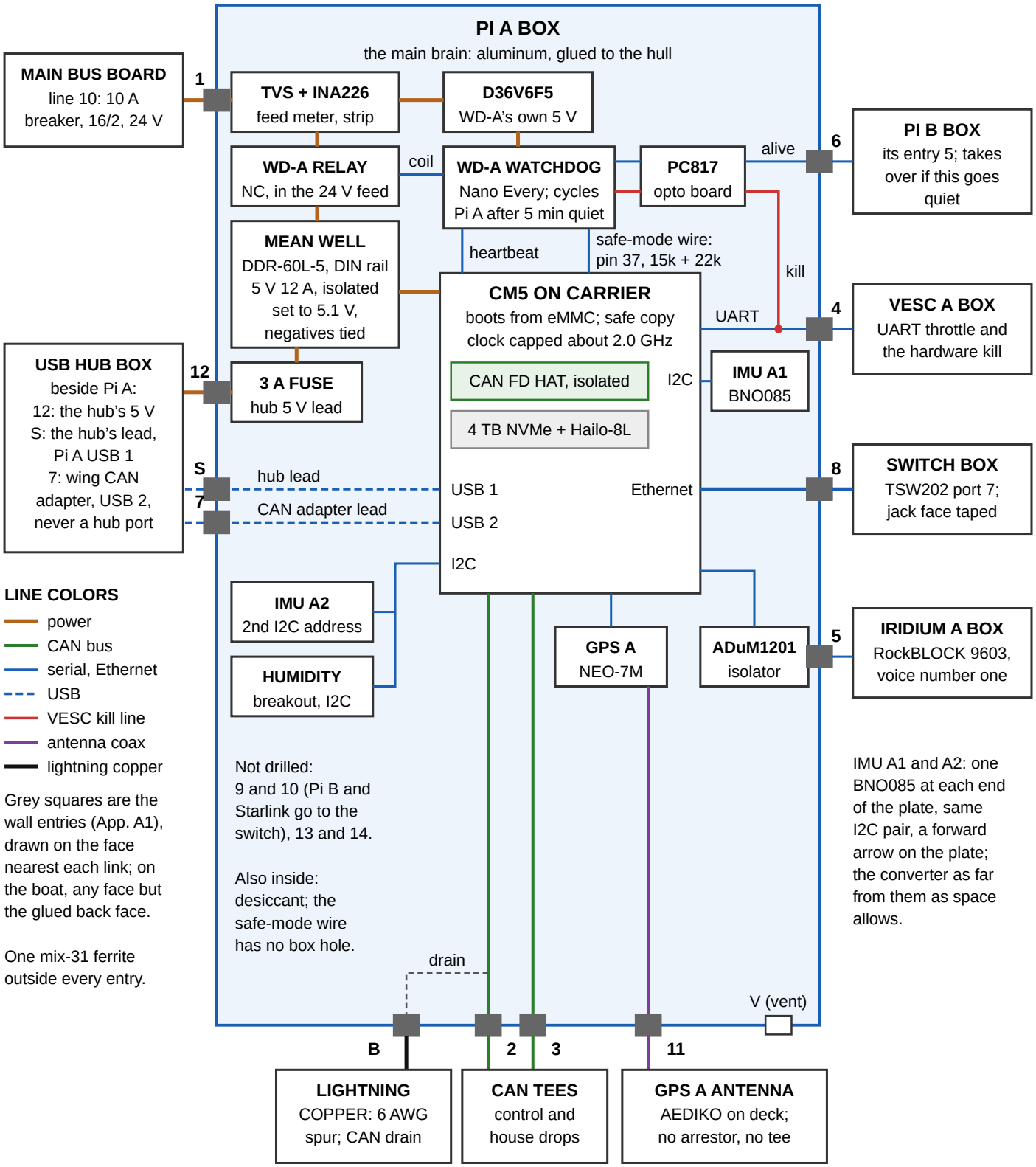
One drawing page per box (the central node has two), then a table of each link and why it is there. Every box with more than one part. Drawn 2026-10-02, rev 2026-10-09, from the v10.2 guides and Pending Amendments v10.3. Entry numbers are the wall holes in Electronics and Wiring Plan Appendix A.

Boxes in this set

Pi A box
USB hub box beside Pi A
Pi B box
Central node
BMS box
Aft junction (plastic box)
Network switch box
VESC A box (the main motor controller)
Battery box
Emergency bank
Iridium A box
Iridium B box
Starlink enclosure
Release Node B
Transom terminal box
Wing box

Pi A box: what is wired to what, and why

From Electronics and Wiring Plan v10.2 (Appendix A1, A1a, secs 2, 6.6, 6.8, 7.6) and Compute Bay Housing and Wiring Plan v10.2 (secs 4.1, 4.3, 6, 7), checked against Pending Amendments v10.3. Drawn 2026-10-02, rev 2026-10-09.



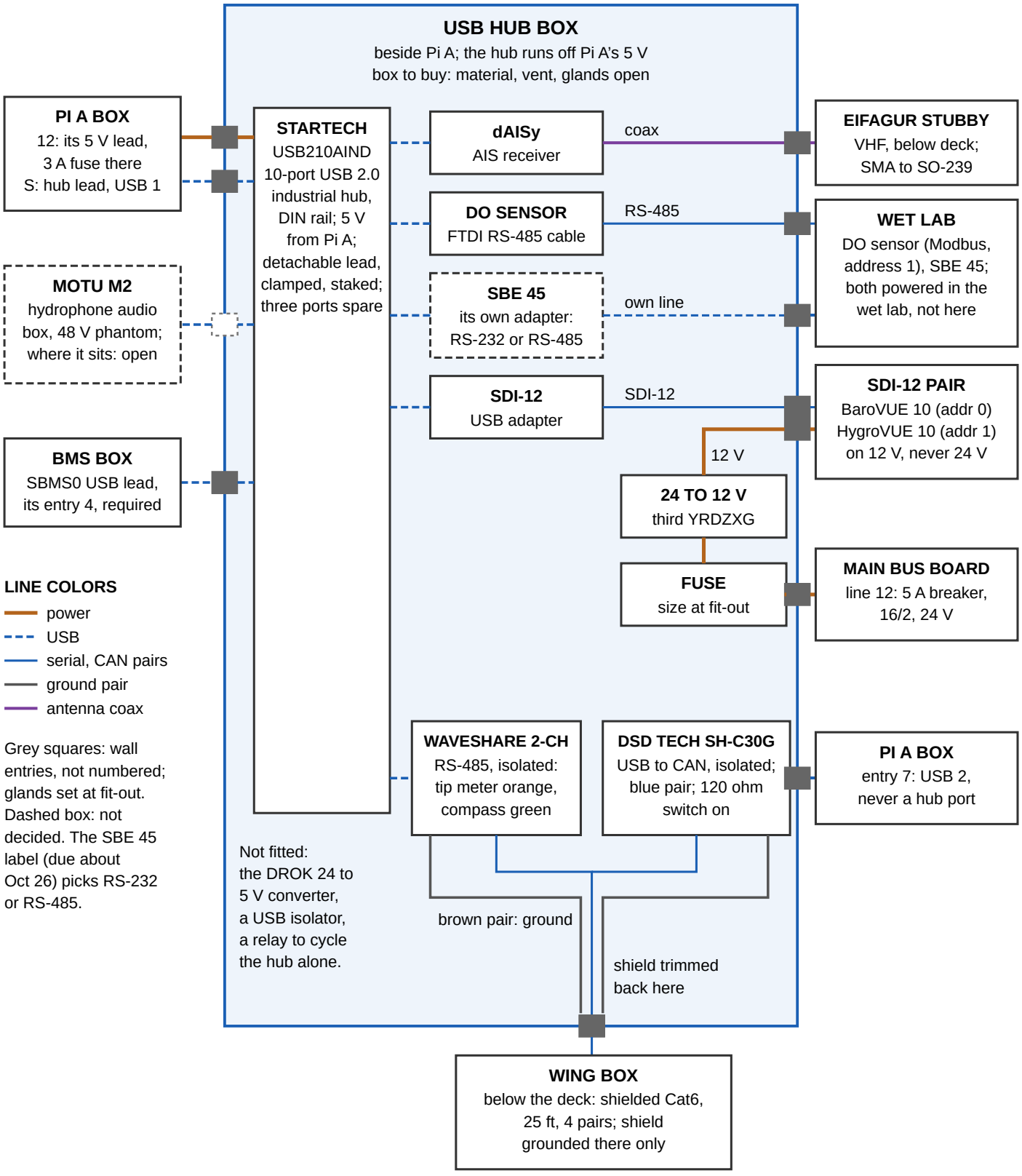
What each link is, and why

Link	What it is	Why
Main bus board to entry 1	24 V on 16/2 from its own 10 A auto-reset breaker (line 10, end stud). Inside, in order: TVS diode (a fast surge clamp), INA226 feed meter, WD-A's relay, the Mean Well, the carrier.	A breaker comes back after a passing fault. No load current passes through this box but its own feed and the hub's 5 V lead.
Mean Well DDR-60L-5 to the CM5	5 V 12 A, 18 to 75 V in, isolated, on a short DIN rail at the far end of the plate from the IMUs; set to 5.1 V, negatives tied. CM5 clock capped at about 2.0 GHz.	Isolated: a failed converter cannot put 24 V on the Pi. The cap keeps the CM5 cooler.
WD-A relay and its supply	A 5 V 1-channel relay module: Pi A's 24 V feed through its normally closed contact, ahead of the converter. WD-A's own 5 V from its own Pololu D36V6F5, fed ahead of the relay.	Coil off means Pi A on: a dead Nano leaves Pi A running. One cycle restarts Pi A and the hub.
Heartbeat, safe-mode wire	Heartbeat from the CM5 to WD-A on a UART. Safe-mode wire: a WD-A output pin to header pin 37 (GPIO26), the 15k in the wire, the 22k from pin 37 to ground (about 3 V at the pin). No box hole.	After 5 minutes of silence WD-A cycles the feed; at the third restart in about an hour it sets the wire first, and Pi A starts from its safe copy. The motor kill pin must not use pin 37.
Entries 12, S and 7 to the USB hub box	12: the hub's 5 V lead off the Mean Well, on a 3 A inline fuse in this box. S: the StarTech hub's detachable USB lead to USB 1, no USB isolator. 7: the wing CAN adapter's own lead to USB 2. Plugs clamped within 2 in, staked.	The hub restarts whenever WD-A cycles Pi A. With one shared supply an isolator would isolate nothing. The wing's control never depends on the hub.
Entry 4 to the VESC A box	One cut Micro-C cable: the CM5's UART throttle and WD-A's kill line (through the PC817 board). No surge part, by choice.	WD-A asserts the kill on heartbeat loss only, so the stop path sits on no bus.
Entries 2 and 3, bond stud B	Control and house drops into the isolated 2-channel CAN FD HAT, terminators off. B: a 6 AWG spur to the lightning copper; the CAN shield drain lands here and nowhere else.	The HAT's 5 kV isolation is the barrier. Boards sit on insulated standoffs: the circuit negative never touches the box.
Entry 5 to the Iridium A box	Serial line through the ADuM1201 isolator chip in this box.	Isolation beats clamping on a data line. Open: the modem's serial logic level; the RockBLOCK datasheet settles it.
Entry 6 to the Pi B box	The "main island alive" signal from WD-A through the HiLetgo PC817 opto board (it crosses a gap as light). The only wire between the Pi boxes.	If it goes quiet, Pi B takes command. A1 and A2 each put an optocoupler inside; Compute Bay sec 6 says one. Not settled.
Entries 8 and 11	8: one Cat6 to the TSW202, port 7, on a bulkhead jack, outside face greased and taped. 11: SMA coax from GPS A (NEO-7M) to an AEDIKO antenna on deck; no arrestor, no bias tee.	Starlink, the cameras and Pi B reach Pi A through the one switch. Two separate GPS chains are the protection.

Main island, wired to the lightning copper. Every line from off the island crosses an isolator before it touches the CM5. IMU A1 and A2 share one I2C pair; if they disagree past a set limit, Pi A falls back to the GPS track and gyro. The box sits at least 2 ft from the main battery and motor cables where space allows. Colors: orange power, green CAN, blue data (USB dashed), red the kill line, purple coax, black the copper.

USB hub box beside Pi A: what is wired to what, and why

From Electronics and Wiring Plan v10.2 (Appendix A1a, A17, secs 6.2, 7.6), Compute Bay Plan v10.2 secs 4.1 and 10.2, Wire and Cable Buy List C8, checked against Pending Amendments v10.3. Drawn 2026-10-02, rev 2026-10-09.



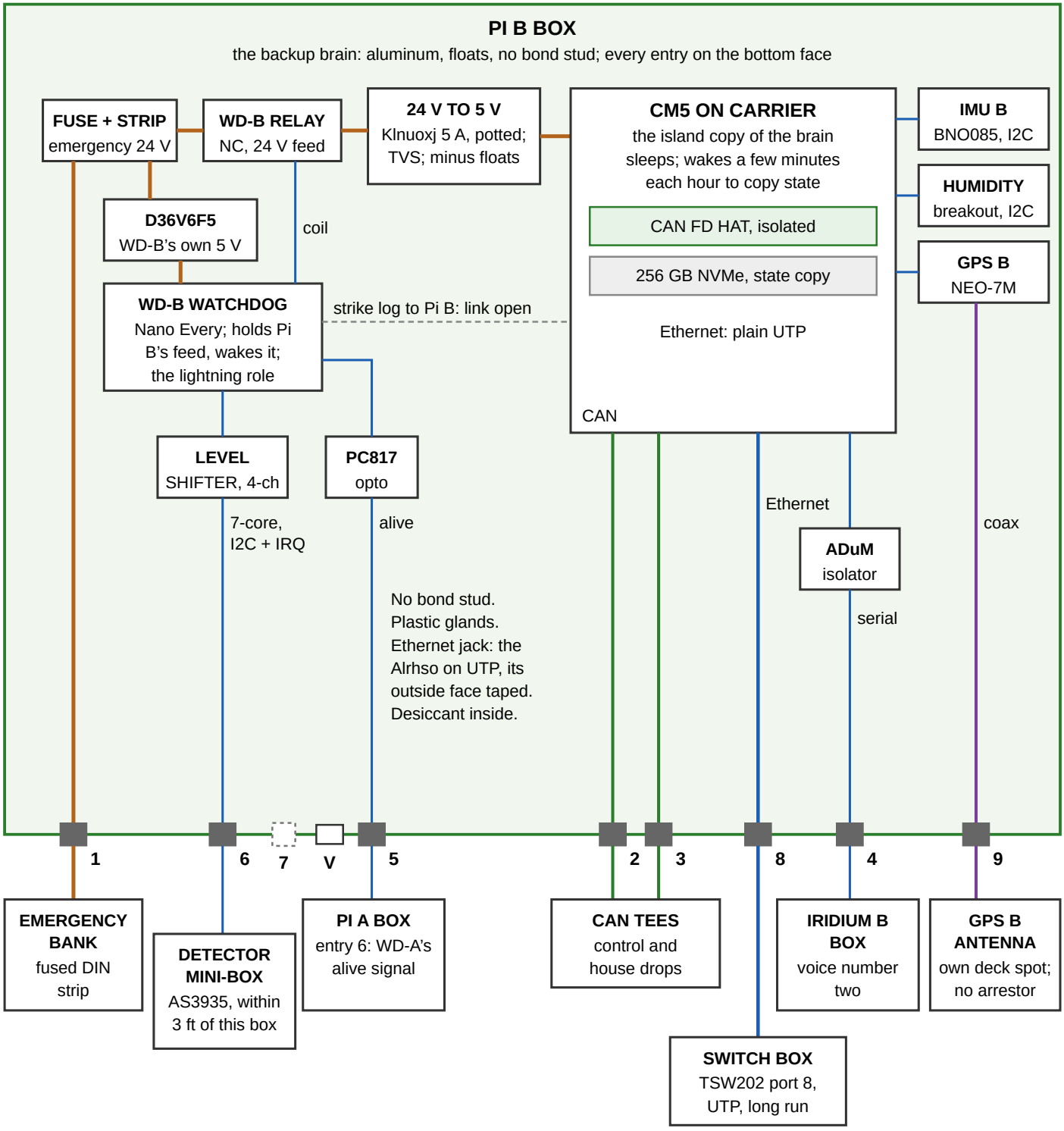
What each link is, and why

Link	What it is	Why
Pi A to the hub (Pi A entries 12 and S)	12: a short 2-core lead off Pi A's Mean Well, on a 3 A inline fuse in the Pi A box, into the StarTech USB210AIND (10-port industrial USB 2.0 hub, DIN rail, 5 to 24 V in). S: the hub's detachable USB lead to Pi A's USB 1, clamped and staked at both ends. No USB isolator.	The hub restarts whenever WD-A cycles Pi A. If the hub drops off, Pi A tries a USB reset, then stops its heartbeat so WD-A cycles both. One shared supply: an isolator would isolate nothing.
Main bus board to the feed entry	24 V on 16/2 from the box's own 5 A breaker (stud table line 12), then one fused line (fuse size set at fit-out) to the third YRDZXG 24 to 12 V converter. Nothing else uses it.	The BaroVUE 10 and HygroVUE 10 top out at 28 V and the bus reaches 28.4 V, so never the 24 V bus. Open: which stud, the end stud or stud 8; Mike's call settles it.
MOTU M2 on a hub port (dashed)	The hydrophone's USB audio box (it powers the S1eX's preamp with 48 V phantom power) on a hub port; the S1eX's XLR cable ends at its input. Open: where it sits, and so whether its lead takes an entry here; A1a's wall list has none.	Pi A's own two USB ports carry the hub's lead and the CAN adapter, so the MOTU needs a hub port.
dAISy to its antenna	The dAISy on a hub port; its coax on an SMA F-F bulkhead to the Eifagur stubby VHF below deck, through one SMA to SO-239 jumper.	Nothing AIS is above deck. AIS from the dAISy depends on the hub; the em-trak is the second receiver.
BMS box (its entry 4) to the hub	USB lead from the SBMS0's WiFi/USB add-on board into a hub port. Readings only.	Required: the battery percentage comes from this stream.
DO sensor and SBE 45 to the wet lab	DO sensor: the FTDI USB-RS485-WE-1800-BT cable, Modbus RTU, address 1. SBE 45: its own adapter, never the DO line. Open: RS-232 or RS-485; its label (about 2026-10-26) settles it, and nothing is bought before.	The SBE 45 answers any character, so a shared Modbus line would set it talking. Both are powered in the wet lab.
SDI-12 adapter to the weather pair	SDI-12 (a simple three-wire sensor bus) USB adapter; the 12 V rides the same cable. HygroVUE set to address 1 before joining; the BaroVUE stays 0.	Both ship at address 0. Open: where the HygroVUE mounts.
Wing box cable to the two readers	Any shielded Cat6, all copper (Mike, 2026-10-09), plugs cut off. Orange: tip meter RS-485 and green: compass RS-485 (A solid, B white) to the Waveshare USB TO 2CH RS485 on one hub port, terminators off. Blue: CAN H solid, CAN L blue-white, to the DSD TECH SH-C30G. Brown: ground, to both adapters' ground terminals on a terminal block. Shield trimmed back here and sleeved.	Isolated readers: a strike's ground jump stops at an inexpensive part. The shield drains at the wing box, the box built to stop a strike; grounded here it would carry the surge in beside Pi A.
CAN adapter to Pi A (its entry 7)	The DSD TECH SH-C30G on its own short USB lead to Pi A's USB 2, never a hub port. 120 ohm switch on; the actuator end has the other.	The wing's control never depends on the hub. Both channels of Pi A's CAN HAT carry the boat's two buses.

Two USB leads to Pi A: the hub's and the CAN adapter's. FTDI silicon only, never CH340 or CH341; a udev rule keyed to each adapter's serial number keeps each sensor's name and sets each FTDI chip's latency timer. No quad-UART HAT, no serial add-on boards. Not fitted: the DROK 24 to 5 V converter, a USB isolator, a relay to cycle the hub alone. Colors: orange power, blue serial and CAN pairs (USB dashed), grey the ground pair, purple coax.

Pi B box: what is wired to what, and why

From Electronics and Wiring Plan v10.2 (Appendix A2, A10, A12, secs 2, 2.7) and Compute Bay Plan v10.2 (secs 4.2, 4.3, 5.2, 6, 7, 14.1), checked against Pending Amendments v10.3. Drawn 2026-10-02, rev 2026-10-09.



LINE COLORS

- power, emergency bank
- CAN bus
- serial, Ethernet
- antenna coax
- not written

No black line: nothing here touches the lightning copper.
Every data link crosses on something that does not conduct.

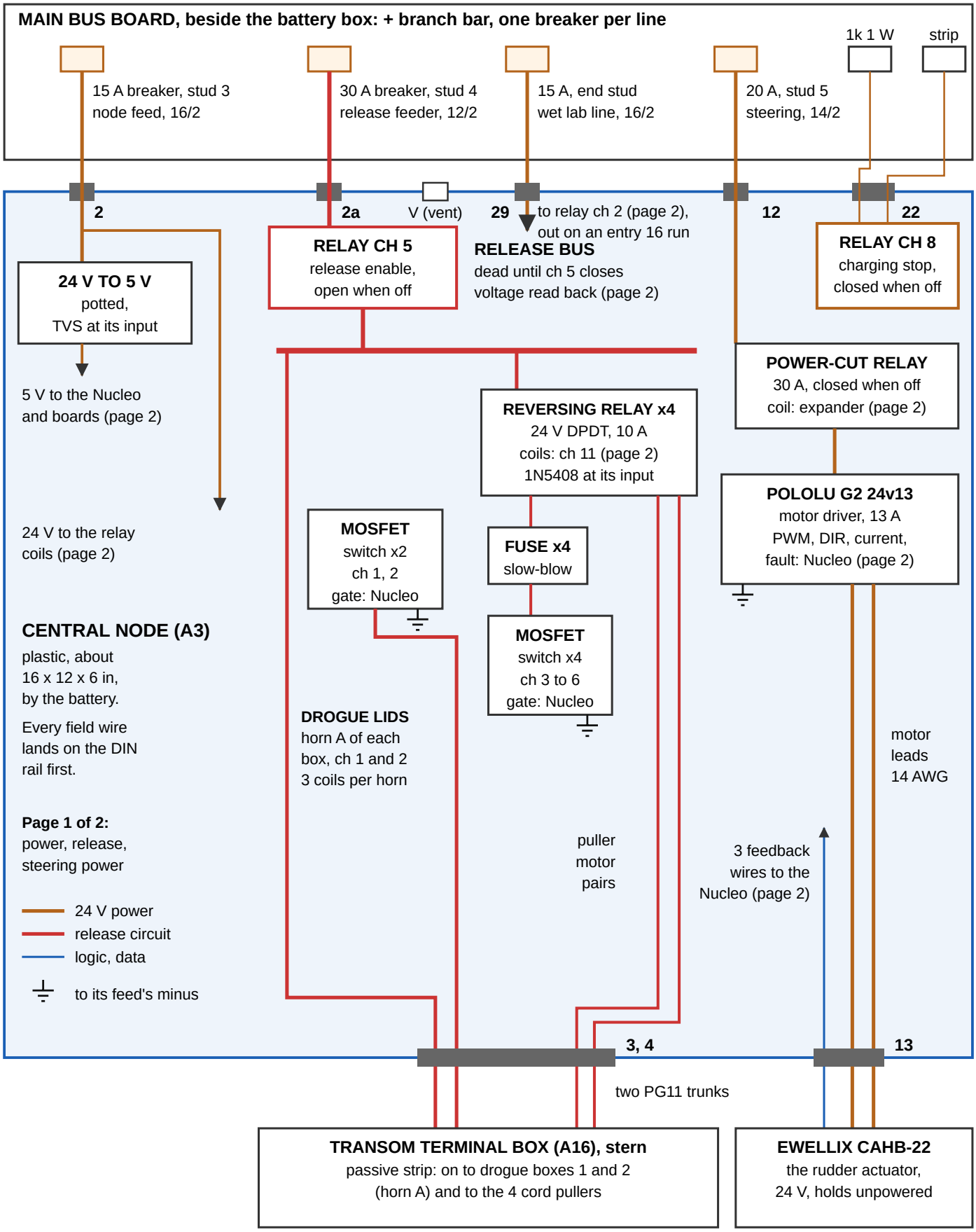
What each link is, and why

Link	What it is	Why
Emergency bank to entry 1	Feed from the Dyness bank's small fused DIN strip (A10). Inside: a fuse and the terminal strip, WD-B's relay, then the potted Klnuoxj 24 to 5 V 5 A converter with a TVS, its negative left floating (tied to nothing).	Power from the emergency bank only, with no copper path to the main bank. Not settled: Compute Bay 4.2 puts the fuse in this box, A10 on the DIN strip.
WD-B relay and its supply	A 5 V 1-channel relay module: Pi B's 24 V feed through its normally closed contact, ahead of the converter. WD-B's own 5 V (Nano, coil, opto input) from its own Pololu D36V6F5, fed ahead of the relay.	Coil off means Pi B on: a dead Nano leaves Pi B running. Pi B sleeps by shutting itself down; WD-B wakes it with a short power cycle.
Entry 6 to the detector mini-box	The 7-core lead, under 3 ft, to the AS3935 (I2C plus interrupt), through a 4-channel two-way level shifter inside this box (the 3.3 V detector to the 5 V Nano). A TVS on the lead, on the floating negative.	WD-B owns the lightning watch and keeps the strike log. It never cuts Pi B's power for lightning. Open: how WD-B hands its strike log to Pi B (drawn dashed).
Entry 5 from the Pi A box	The "main island alive" signal from WD-A, through a HiLetgo PC817 opto board, to WD-B. Cut Micro-C cable.	If it goes quiet, WD-B promotes Pi B to command. Failover sticks until a signed reset by Iridium. A1 and A2 each put an optocoupler inside; Compute Bay sec 6 says one.
Entries 2 and 3 to the CAN tees	Control and house drops (cut Micro-C) into this box's own isolated CAN FD HAT.	The HAT's isolation is the barrier between the islands on each bus.
Entry 4 to the Iridium B box	Serial line through this box's ADuM1201 isolator. Cut Micro-C cable.	Voice number two lives wholly on this island.
Entry 8 to the network switch box	Plain UTP (unshielded) Cat6, long run to the TSW202, port 8, on the Alrhso bulkhead jack (zinc and plastic), its outside face greased and taped.	On UTP the jack's metal touches no wire or shield, so no metal ties this box to Pi A.
Entry 9 to GPS B's antenna	SMA coax from the second NEO-7M, no arrestor, no bias tee.	The beacon role always has live position. Open: this metal SMA bulkhead against the isolation rule; a decision on it settles it.
Inside, no wall entry	IMU B (BNO085) on I2C, with its forward arrow and its own offsets; humidity breakout; desiccant; 256 GB NVMe with the state copy. Entry 7 blank, V the vent.	

The five isolation rules: emergency-bank power only; every data link optical or transformer coupled; no metal shell or shield ties this box to Pi A (plastic glands, UTP); no bond stud, ever; everything else on the emergency bank (Iridium B, the detector, WD-B) on this side. Colors: orange power, green CAN, blue serial and Ethernet, purple coax, grey dashed not written.

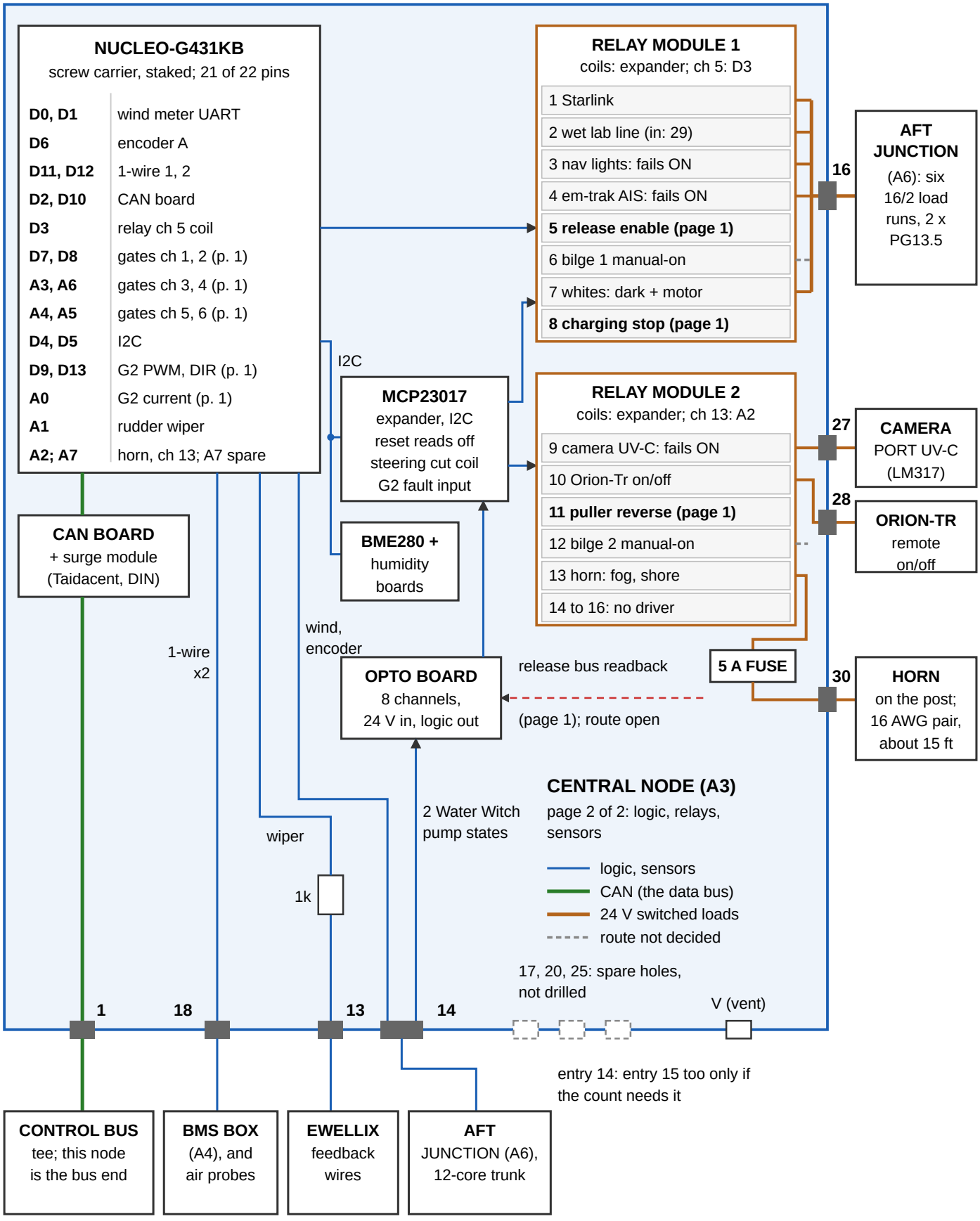
Central node: what is wired to what, and why (1 of 2)

Power, release, steering. From Electronics Plan v10.2 secs 4.1, 5.6, 6.7, 7.6, App. A3. Drawn 2026-10-02, rev 2026-10-09.



Central node: what is wired to what, and why (2 of 2)

Logic, relays, sensors. Pins: Compute Bay Plan v10.2 sec 10.2; relays: sec 11; holes: Electronics Plan v10.2 App. A3. Drawn 2026-10-02, rev 2026-10-09.



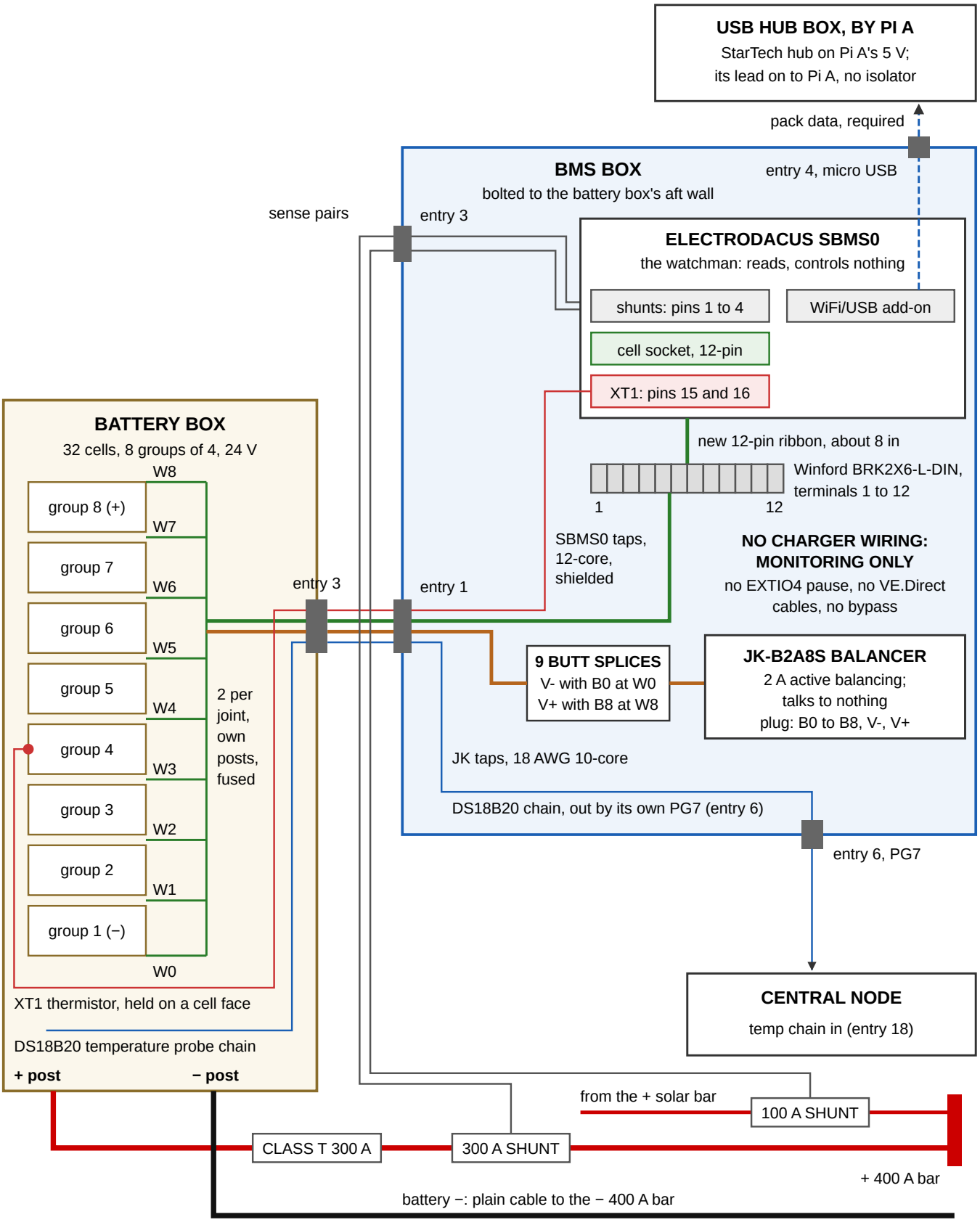
What each link is, and why

Link	What it is	Why
Node feed (entry 2)	16/2 from its own 15 A auto-reset breaker, stud 3, PG9. Feeds the 24 to 5 V converter and the relay coils.	Brains only: release, steering and the wet lab have their own feeds.
Release feeder (entry 2a) to relay ch 5	12/2 on its own 30 A breaker, stud 4, alone; PG11 or PG13.5 once the jacket is measured. Ch 5 (normally open, coil on D3) feeds the release bus.	A burn draws about 25 A for up to 60 s. 12/2 matches Release Node B, so both paths lose about the same.
Release bus to drogue lids (ch 1, 2)	Bus to horn A on each drogue box (3 coils side by side, 12.5 A), back to its MOSFET switch. 14 AWG fire pairs (the 14/4 bought).	Ch 5 closed and the MOSFET on must both happen. Horn B is Release Node B's; either horn alone cuts the strap.
Release bus to cord pullers (ch 3 to 6)	Each: bus to its reversing relay (24 V DPDT, 10 A, 1N5408 at its input), to a slow-blow 5 x 20 mm fuse, to its MOSFET. Motor pair out to the trunk.	Forward is release; the relay coils hang on ch 11, used only in a shore test. The fuse is the fire guard.
Trunks to the transom box (entries 3, 4)	Two PG11 trunks: the two drogue node-A fire pairs (14 AWG) and the four puller power pairs on two 18 AWG 4-core cables, one per two pullers; 22 AWG for the rest.	Two trunks instead of four long runs. Reverse adds no wires aft. Open: which cores ride which trunk.
Steering (entries 12, 13)	In: 14/2 from its own 20 A breaker, stud 5, through the 30 A power-cut relay (closed when unpowered) to the Pololu G2 24v13. Out: two 14 AWG motor leads, 3 feedback wires (brown 3.3 V, white ground, green wiper via a 1k to A1). PG11 each.	A dead node leaves the rudder fed. A drive usually fails stuck on; this relay is then the only stop.
Charging stop (entry 22)	Thin wire from the 1k 1 W resistor at the + bar, through ch 8's normally closed contact, back to the main bus board, where the five Victron remote cables meet, tied. PG9, no fuse.	Charging on by default; coil on (shore command, 5-day limit) stops all five. A dead node drops it.
CAN, logic and relay boards (entry 1)	Control bus drop, PG7, through a DIN surge module to the CAN board; this node is the bus end. D3 drives ch 5, A2 ch 13 (the horn); the MCP23017 expander every other coil and the steering cut.	The expander is never in the release chain. A reset reads as off: loads drop, steering stays fed, charging goes on.
Wet lab line (entry 29)	Its own 16/2 from its 15 A breaker (line 9, end stud), PG9, to ch 2's contact; out on an entry 16 run, through the aft junction to the wet lab.	Ch 2 switches the wet lab's own line, never the node's feed. Open: confirm podlink does not already own that switching.
Switched loads out (16, 27, 28, 30)	16, PG13.5 x2: six 16/2 runs to the aft junction (ch 1, 2, 3, 4, 7; the bilge manual-ons, ch 6 and 12, ride these or the trunk: settle at loom time). 27, PG7: ch 9 to the camera port UV-C. 28, PG7: ch 10 to the Orion-Tr. 30, PG9: ch 13 through a 5 A inline fuse, a 16 AWG pair, about 15 ft to the horn on the post.	Nav lights, em-trak and UV-C fail on; a dead node leaves the horn silent. No Pi heard for the set time: the node lights the nav lights and drops ch 8. Fog mode: one long horn blast every 2 minutes.
Sensors in (entries 14, 18)	Entry 14, PG11: 12-core aft trunk (wind, encoder A, two Water Witch states). Entry 18, PG9: 1-wire chain 1 (battery probes) and chain 2 (air).	Chain 1 is the battery trip. 15 only if needed; 17, 20, 25 not drilled.

Release needs two acts: ch 5 closed and that channel's MOSFET on, both from native Nucleo pins. Colors: orange 24 V, red release, blue logic, green CAN; grey dashed not decided.

BMS box: what is wired to what, and why

From Electronics and Wiring Plan v10.2 (sec 6.7, Appendix A3, A4, A9) and Battery Box Building Guide v10.2 Part 8. Drawn 2026-09-07, rev 2026-10-08. The table and notes are on the next page.



Both shunts sit on the + side, on the main bus board; only their thin sense wires go up to entry 3, one pair per shunt, each wire on a 30 AWG fuse link at the shunt, a cover on each shunt.

What each link is, and why

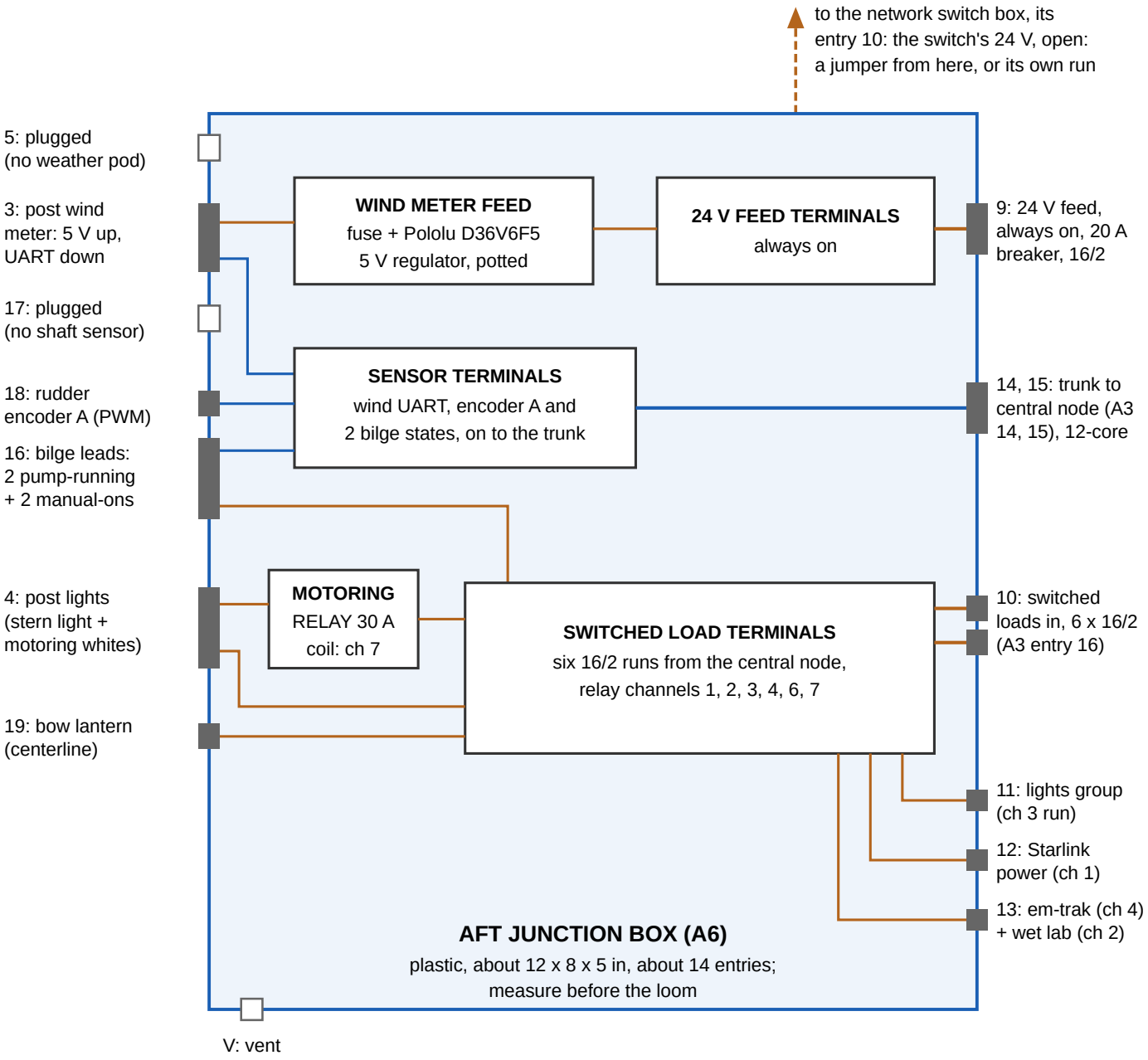
Link	What it is	Why
Battery box (its entry 3) to BMS box (entry 1)	One bundle: 18 tap wires (W0 to W8 twice), each on its own ring and 30 AWG fuse link at the battery, the two wires of each joint on two posts. The SBMS0's nine and the XT1 pair on 11 cores of the 22 AWG 12-core shielded cable (shield grounded at this box only, at W0); the JK's nine on its 18 AWG 10-core. Plus the DS18B20 chain, sleeved so the gland seals on one round sleeve. Open: the gland, PG13.5, PG16 or PG21, once the sleeved bundle is measured. No gas sensor lead.	The SBMS0's taps read the 8 group voltages. The JK pushes up to 2 A through its own taps; on shared wires that would put tens of mV of error into the SBMS0's readings.
SBMS0 to the breakout board, inside	A new 12-pin ribbon, about 8 in, to the Winford BRK2X6-L-DIN on the DIN rail; terminal n = ribbon wire n. W0 on 1 (jumper 1 to 2, shield drain on 2), W1 to W7 on 3 to 9, W8 on 10 (jumpers 10 to 11, 11 to 12). At most two wires under one screw.	The SBMS0's own ribbon is never cut or lengthened (never longer than its 6 ft).
Shunts to BMS box (entry 3)	One twisted pair per shunt (stranded Cat6, ferrules) on the green plug: battery shunt to pins 4 and 3, solar shunt to 2 and 1. Both shunts on the + side of the main bus board. Each wire on a 30 AWG fuse link at its shunt; a cover on each shunt. Sense leads only.	The SBMS0 reads a shunt only with 4 to 76 V on it: on the − side it would read nothing.
BMS box to the USB hub box beside Pi A (entry 4)	Micro USB lead from the WiFi/USB add-on, tied down outside the plug, into the StarTech hub. Required. No USB isolator: the hub runs on Pi A's own 5 V.	The battery percentage comes from this stream: the SBMS0 shunt is the only current sensor aboard. A quiet stream raises an alert.
BMS box to the central node (entry 6)	The temperature chain, connected to neither board: in with the bundle by entry 1, out by its own PG7 (entry 6 in Appendix A4) to central node entry 18.	The six pack probes carry the battery trip: 150 F, or a 10 F rise in five minutes, isolates the bank.
Balancer	Its 11-pin plug: B0 to B8 plus its own power pair, V- and V+ (10 to 40 V), joined to its 10-core cable by butt splices; V- shares the W0 splice, V+ the W8 splice. Set up by phone over Bluetooth: LiFePO4, 8 cells.	It only evens out the groups: no data, no control, no wire to the node or the Pi.

Where it goes. Bolted through the battery box's aft wall on the minus side, opposite the main fuse, at mid-height or above, never on a long side wall: four 1/4 in stainless bolts, each bedded in sealant (Battery Box Building Guide Parts 4 and 8). Glands face down, each cable with a drip loop.

Monitoring only. No wire leaves this box to a charger, relay or load. No CAN and no RS-485. The only data wire is the USB lead to the hub box beside Pi A, which is required. The charge limits live in the five MPPTs' own lithium profiles. Nothing stops charging in the cold automatically: Pi A alerts shore below 33 F on any pack probe, and shore can send the 5-day charging stop (relay channel 8).

Aft junction (plastic box): what is wired to what, and why

The plastic aft junction box at the stern. Beside it sits the aluminum network switch box, which takes every network cable; it has its own pages, next. From Electronics and Wiring Plan v10.2 (Appendix A6, secs 4.1, 6.4, 7.6), checked against Pending Amendments v10.3. Drawn 2026-10-03, rev 2026-10-09. The table is on the next page.



Passive: no computer. Far ends: the post, the central node (Sheet A3), the bilge pumps, the bow lantern. No network cable comes into this box: they all go to the switch box.

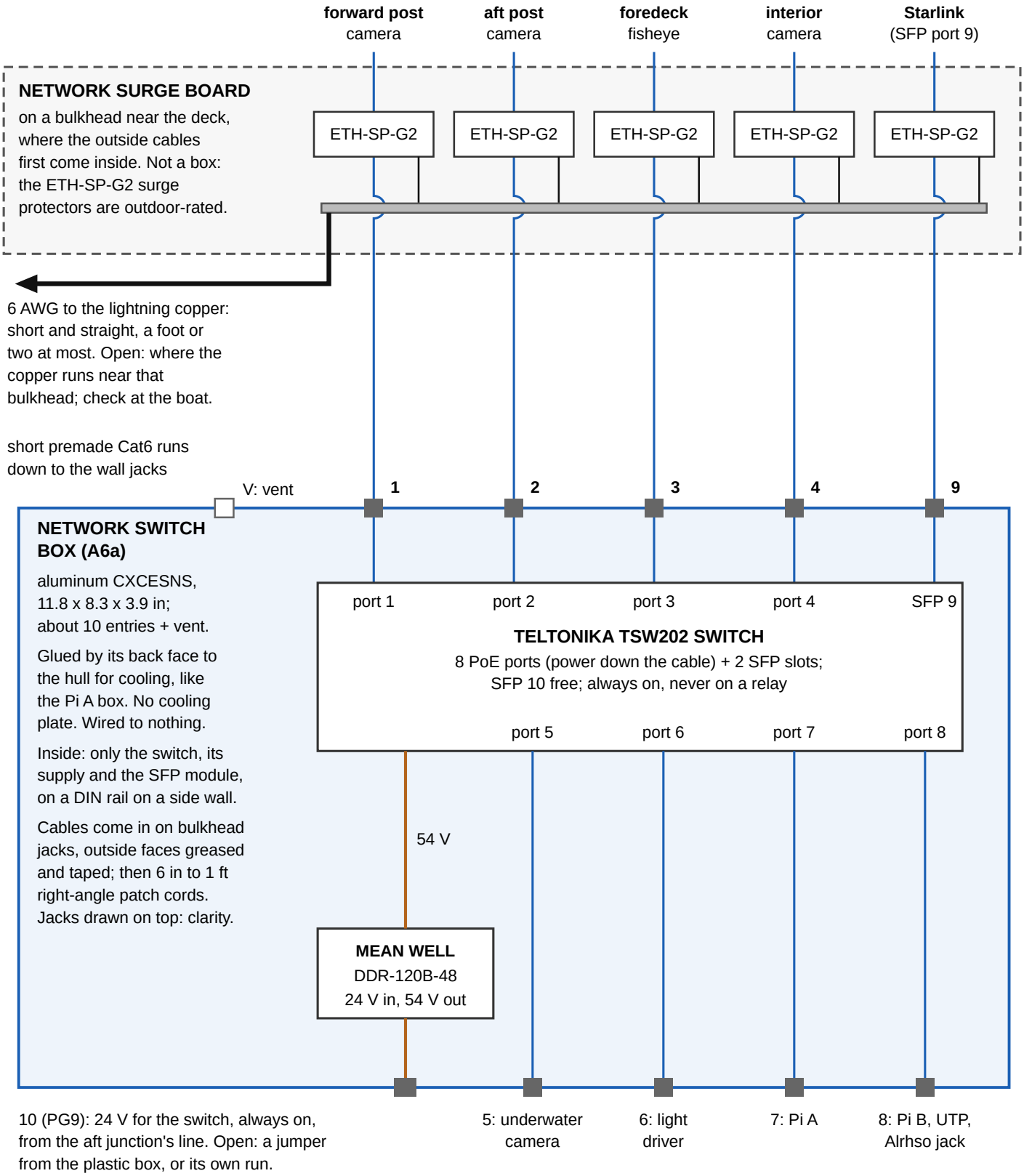
Aft junction (plastic box): what each link is, and why

Link	What it is	Why
Entry 9: 24 V feed	Always on, 16/2 from its own 20 A breaker (bar stud 6). Feeds the post feeds, one fuse each. *Open:* whether the switch box's 24 V (its entry 10) is a short jumper from these terminals or its own run.	The switch must never be on a relay: losing it blinds Starlink and cuts the Ethernet between the Pis.
Entry 3: post wind meter	The Calypso CMI1018: 5 V up from the Pololu D36V6F5 just after its fuse; its UART down to the sensor terminals and on to the trunk.	The meter dies on 24 V; the regulator is fitted and potted at the bench.
Entries 16, 18 and the trunk (14, 15)	The two Water Witch pump-running outputs (24 V = pump running) and rudder encoder A ride the 12-core trunk to the central node, with the wind UART.	The node reads the bilge states on its opto board and encoder A on its timer pin (confirm at fit-out). One trunk is likely enough; drill 15 only if the count needs it.
Entry 10 in, entries 11 to 13, 4, 16, 19 out: switched loads	Six 16/2 runs from the central node relays: Starlink power (ch 1), the wet lab’s own line (ch 2; its own 15 A breaker, in by central node entry 29), nav lights (ch 3, fails ON), em-trak (ch 4, fails ON), bilge pump 1 manual-on (ch 6), motoring-white coil (ch 7). Pump 2’s manual-on (ch 12) rides a 16/2 run or the trunk: settle it at loom time.	Everything switched is switched at the node; this box only lands and passes it on. The wet lab’s line goes on with the em-trak’s by entry 13.
Motoring relay, entry 4	A 30 A relay here, coil on channel 7 (normally open), feeds the two all-round whites up the post lights cable.	The whites come on only when it is dark and the motor is running (in fog mode, whenever the motor runs). An all-round white shown while sailing is the wrong picture, so this one fails OFF. The stern light and bow lantern ride channel 3 directly and fail ON.
Network cables: none here	Entries 1, 2, 6 to 8 and 20 to 24 are the network switch box’s (A6a); their numbers are kept here, not drilled.	Every network cable ends at the one switch, in its own aluminum box beside this one.

A patch panel. No computer, about 14 entries (15 if the second trunk is drilled) plus the vent; measure the box before the wires are cut. Lighting leaves three ways (entries 4, 11, 19); settle the split at loom time. Colors: blue data, orange 24 V power; dashed means not decided.

Network switch box: what is wired to what, and why

The aluminum box beside the plastic aft junction box; above it, the network surge board near the deck (a board, not a box). From Electronics and Wiring Plan v10.2 (Appendix A6a, secs 6.1, 6.4, 7.4), Compute Bay Housing and Wiring Plan v10.2 (secs 2.3, 4.4, 11), Lightning Ground System Guide v10.2 (secs 6.2, 7.4), checked against Pending Amendments v10.3. Drawn 2026-10-03, rev 2026-10-09. The table is on the next page.



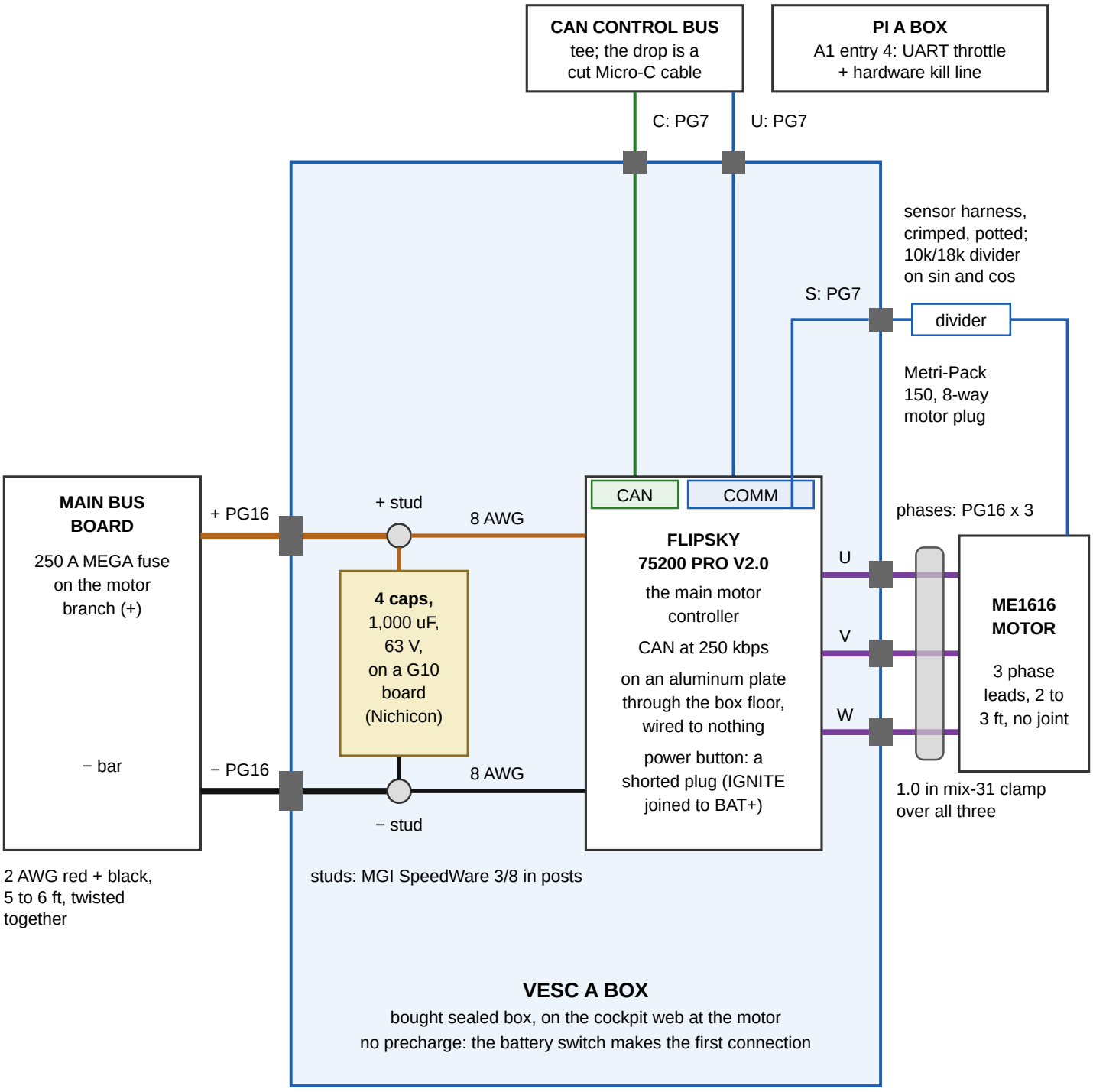
Network switch box: what each link is, and why

Link	What it is	Why
Post cameras, foredeck fisheye, interior camera, Starlink: through the surge board to switch box entries 1 to 4 and 9	One Ubiquiti ETH-SP-G2 Ethernet surge protector each (bought 2026-10-01, outdoor-rated) on a small board on a bulkhead near the deck, where the cables first come inside; then a short premade Cat6 down to the switch box's wall jacks, low in the hull; then a 6 in to 1 ft patch cord to switch ports 1 to 4 and SFP 9 (Starlink through a copper SFP module).	These five run on deck or near it. The protector stops a surge where it comes in, before it can reach the one switch that carries every camera, Starlink and the Pi to Pi link. Keep the cables before the protectors apart from the cables after them.
Protector grounds to the lightning copper, at the surge board	All five ground leads on one small tinned bar on the board; one 6 AWG lead, short and straight, a foot or two at most, to the nearest point on the lightning network (bonding list item 11). *Open:* where the lightning copper runs near that bulkhead; check at the boat.	The shorter and straighter the ground lead, the less surge voltage it lets through. The switch box has no ground lead and nothing lightning-related inside.
Network cables, all	Premade, plugs and all; none crimped on the boat. Extra coiled near the surge board in small tight strapped coils about 8 in across, camera-side coils apart from switch-side coils. No coils in the switch box. No sharp bends at any plug.	A big loose loop catches a nearby strike like an antenna; small tight coils catch far less. Check each plug passes the deck holes and glands on its route, or use a split gland.
Switch box entries 5 to 8: underwater camera, light driver, Pi A, Pi B	Bulkhead jacks, then patch cords to ports 5, 6, 7 and 8. Pi B’s run is plain UTP on the Alrhso jack (zinc and plastic). No surge protector.	These stay low inside the boat. On UTP the jack’s metal touches no wire or shield, so Pi B’s island stays apart.
Bulkhead jacks, all nine	Alrhso IP67 RJ45 jacks, one per cable. Outside face: a smear of dielectric grease on the plug, then self-fusing silicone tape, half-overlapped, from the threads over the plug and 1 to 2 in down the cable. Side or bottom walls only (drawn on top for clarity). Inside: right-angle patch cords, each tied down within about 2 in of its plug.	Salt air corrodes the thin gold plating, and the cap seals only an empty jack. Open: which way the right-angle plugs must point; reading it off the switch settles it.
Switch box entry 10: 24 V feed	Always on, from the aft junction's line (the plastic box's entry 9: 16/2 from its own 20 A breaker, bar stud 6). Feeds the Mean Well DDR-120B-48 (set and sealed at 54 V) for the switch. *Open:* whether it comes by a short jumper from the plastic box or by its own run.	The switch must never be on a relay: losing it blinds Starlink and cuts the Ethernet between the Pis.
Switch box glued to the hull	The aluminum box's back face glued to the hull in heat-carrying epoxy, like the Pi A box; wired to nothing. The switch and its supply clip to a DIN rail on a long side wall: the box is 3.9 in deep, the TSW202 4.8 in.	Puts the switch's heat into the hull. The box touches no other metal, so it has no lightning connection at all.

Every network cable ends here. Nine bulkhead jacks (a tenth only if SFP 10 is used), the 24 V feed and a vent. Entry 11 is not drilled (no ground lead: the protectors' ground is at the surge board); entry 12, SFP 10, gets a coupler only if wanted. The surge protectors sit outside this box, on their board near the deck. Colors: blue Ethernet, orange 24 V or 54 V power, black ground to the lightning copper; dashed outline means a board, not a box.

VESC A box (the main motor controller): what is wired to what, and why

From Electronics and Wiring Plan v10.2 (Appendix A7, secs 7.5, 7.6), Build Guide v10.2 sec 5.1, System Settings Sheet v10.2 sec 2, Bill of Materials v10.2 sec 15.5, Reference/Controller_Capacitor_Bank_2026-09-26, checked against Pending Amendments v10.3. A7 does not number the holes, so the letters are the box sheet's. Drawn 2026-10-02, rev 2026-10-09.



What each link is, and why

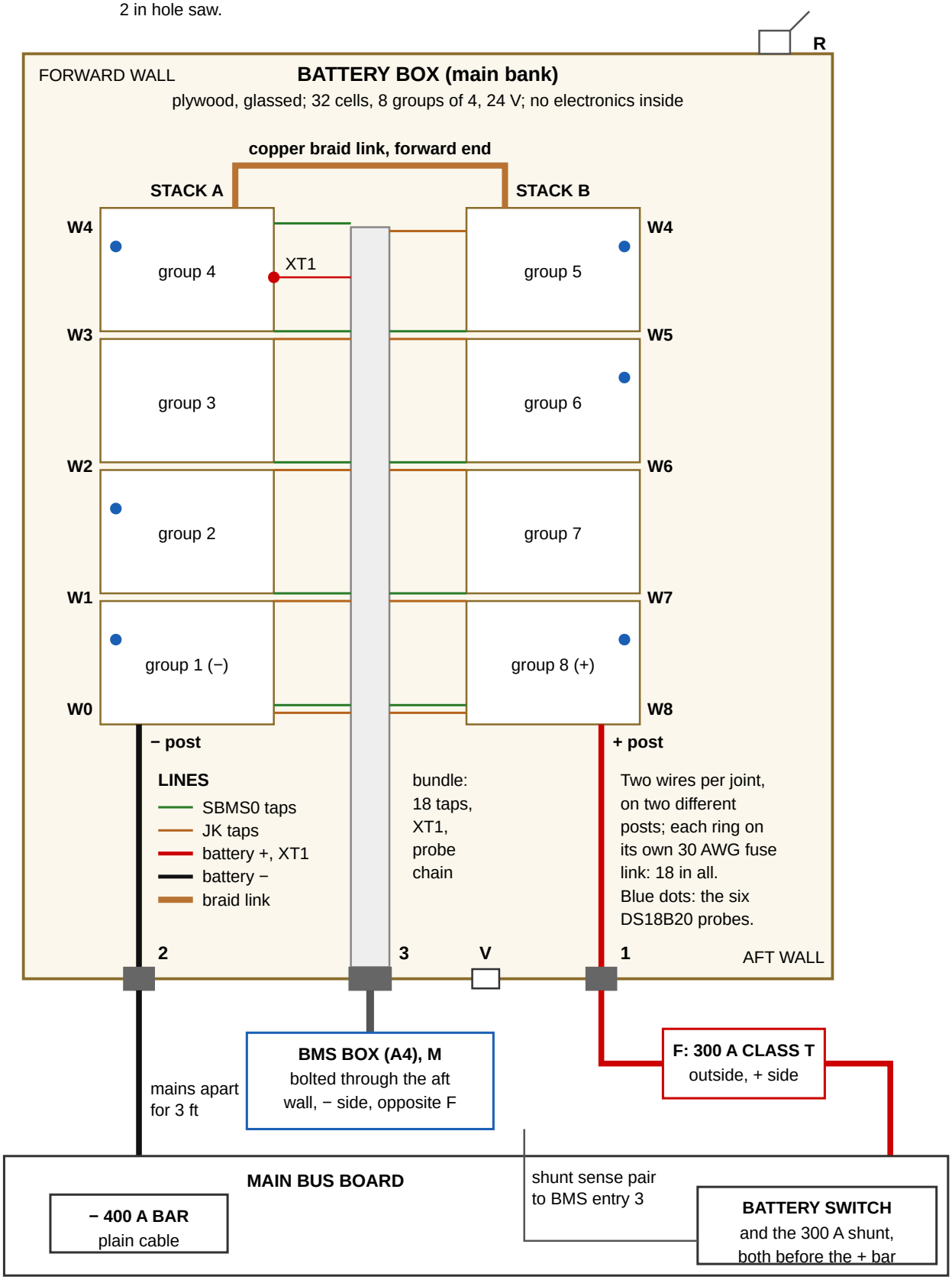
Link	What it is	Why
+ and − (PG16 each): battery feed	2 AWG red and black, 5 to 6 ft, twisted together, from the main bus board: + through the 250 A MEGA fuse on the motor branch, − from the − bar. Each lands first on its stud.	Sized for the CUT-BURST (about 180 A battery side for seconds), not for cruise (about 85 A, 2 kW). Twisting shrinks the loop that makes voltage spikes.
Studs and capacitor board	Two insulated MGI SpeedWare 3/8 in posts (bought 2026-09-26, here 2026-09-28). On each: the 2 AWG lug, the controller's own 8 AWG lead cut short, the capacitor board's copper strip. Four Nichicon 1,000 uF 63 V on a G10 board.	The long battery leads ring on every switching edge; owners report blown capacitors, then transistors. The extra capacitors right at the controller soak that up. Nothing is spliced or soldered to a wire.
C (PG7): CAN control bus drop	CAN plug, JST-GH 5-pin: CANH, CANL and GND only; PWR.ON left open. 250 kbps.	The normal path for throttle and readings. On a CAN timeout the controller ramps to zero and the boat sails.
U (PG7): UART and kill to Pi A	Its own Micro-C cable, cut in the middle, to Pi A entry 4; never shares a CAN cable. Lands on the COMM plug (JST-PH 8-pin: TX, RX, GND) plus the kill line, which leaves WD-A through a PC817 opto board in the Pi A box. No surge part, by Mike's choice.	The backup throttle path: Pi A switches to it if CAN is silent over 2 s. The kill line is the hardware backstop under the Pi's jam logic.
S (PG7): motor sensor	The ME1616's SinCos sensor harness (six wires, crimped, potted): sin to ADC1, cos to ADC2, 5 V and GND on the COMM plug, through a 10k/18k divider on each signal unless the bench check shows the tops stay under 3.2 V. The KTY84/130 motor temperature pair on the same lead. The motor’s plug is an Aptiv Metri-Pack 150, 8-way, sealed; its mating plug is ordered.	The sensor lets the motor start hard from a standstill; without it the controller runs sensorless, fine at cruise. The temperature sensor derates the motor by itself even if the Pi is down.
Phases U, V, W (PG16 x 3)	The motor's own three orange leads, 2 to 3 ft, lugs fitted, labelled; one 1.0 in mix-31 clamp ferrite over all three just outside.	No joint anywhere in the 300 A path. Short and bundled, so their fields cancel.
Shorted plug, cooling plate	A crimped plug joins IGNITE to BAT+ in place of the power button. The controller sits on an aluminum plate through the box floor, set in epoxy, wired to nothing.	The board runs whenever the battery is connected. The plate is the controller's whole heat defense; size it before the box is drilled.

One controller on Boat 1: the Flipsky 75200 Pro V2.0, bought 2026-10-03 on Amazon, $160.99, here 2026-10-07. Losing it costs time, not the trip: the wing sails the boat. VESC B is Boat 2 only. No precharge (Mike, 2026-09-29): the battery switch is built to make the first connection. Bench first: find pin 1 on each plug with a meter, check the sensor tops, check the motor reads room temperature within about 5 F. Colors: orange battery +, black battery −, purple motor phases, green CAN, blue UART and sensor.

Battery box: what is wired to what, and why

From Electronics and Wiring Plan v10.2 (Appendix A4, A9, sec 7.6) and Battery Box Building Guide v10.2 (Parts 5, 7, 8, 9), checked against Pending Amendments v10.3. Drawn 2026-10-02, rev 2026-10-09.

R: relief stub, forward wall, high: 1-1/2 in Sch 40 PVC glassed through, 45 degrees up; a Dometic 385310076 duckbill inside, lips out; discharge forward into the cabin; no screen; 2 in hole saw.



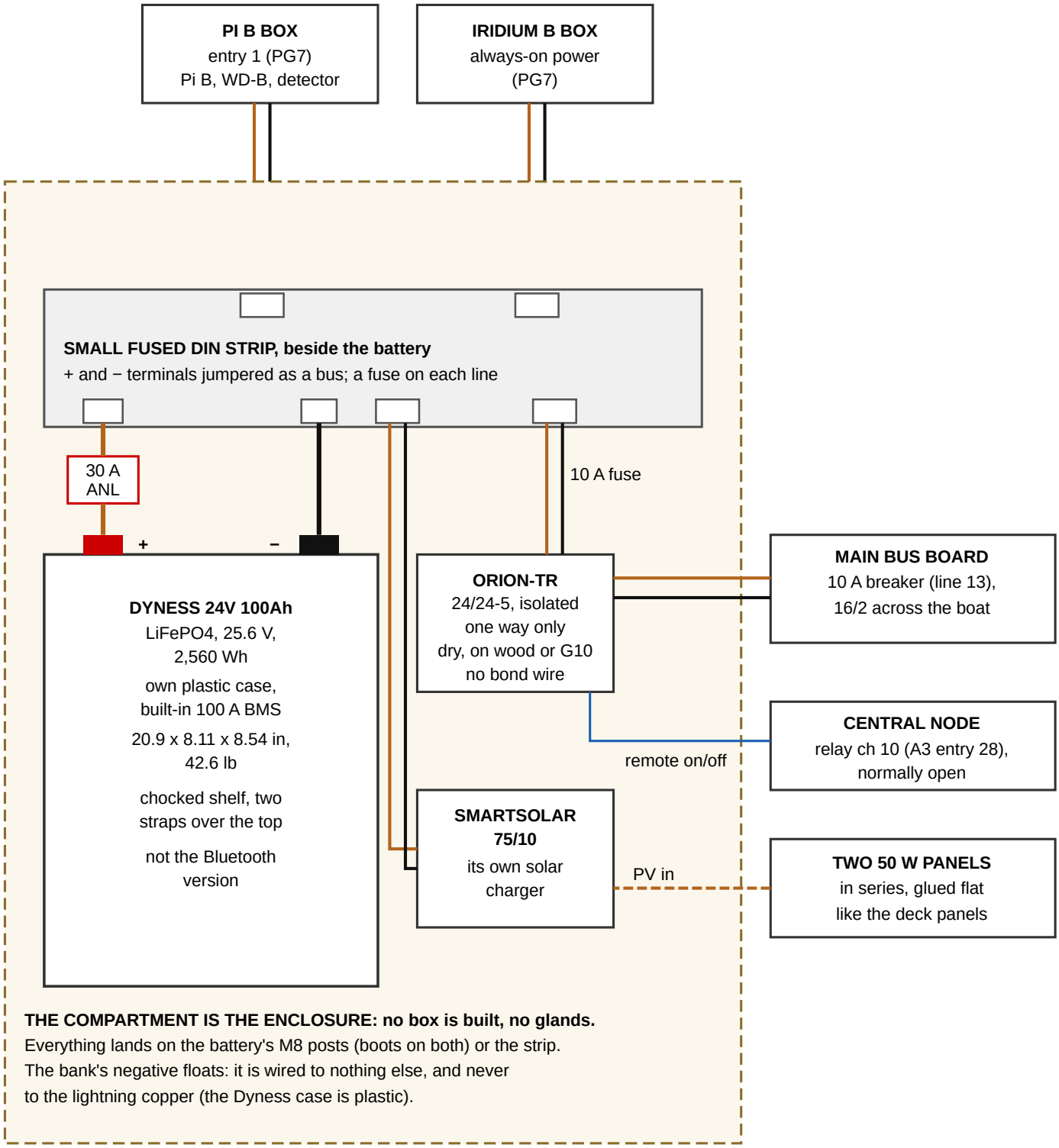
What each link is, and why

Link	What it is	Why
Entry 1 (PG16): main +	2 AWG from the pack + post (B1), straight over the aft G10 plate at measured post height, out with a drip loop to the 300 A Class T fuse (F) bolted outside the aft wall at mid-height on the + side (within 12 in of the gland), then sleeved 2 AWG to the Blue Sea 6006 battery switch on the main bus board. The 300 A battery shunt sits between the fuse's output and the + 400 A bar.	The fuse at the box protects the whole run to the board. Not yet measured: the room on the wall for the fuse block, its cover and the cable bend. Any bolt through the wall is bedded in sealant.
Entry 2 (PG16): main −	2 AWG from the pack − post (A1): plain cable to the − 400 A bar. No shunt on this side.	The SBMS0 reads a shunt only with 4 to 76 V on it, so both shunts sit on the + side. For the first 3 ft the + and − mains run apart, each in chafe sleeve, never crossing.
Entry 3: signal bundle to the BMS box	Eighteen tap wires, two per joint W0 to W8, each on its own ring on its own post and its own 30 AWG fuse link at the ring: the SBMS0's nine on the 22 AWG 12-core shielded cable (with the XT1 pair), the JK's nine on the 18 AWG 10-core. Plus the six-probe DS18B20 chain. Sleeved in adhesive-lined heat shrink at the gland; held by clamps on the long walls, never tied to the cells. Gland PG13.5, PG16 or PG21: open until the sleeved bundle is measured.	Never a shared wire: the JK's balancing current on a shared tap would show as an error in the SBMS0's readings. A shorted tap opens its own link and stays cold. The probes carry the battery trip: 150 F, or a 10 F rise in five minutes.
Braid link (forward end)	One copper braid link (2-pack bought 2026-10-03) across the center gap between group 4 (stack A) and group 5 (stack B), at the forward end. W4 taps on this joint.	With both pack ends aft and four groups a stack, the chain runs up one stack and down the other. The braid lets the stacks move a hair without working the terminals.
M: the BMS box	Bolted through the aft wall on the minus side, opposite F, at mid-height or above: four 1/4 in stainless bolts, each hole bored oversize, filled with thickened epoxy and redrilled, each bolt bedded in sealant. Drill before the pack goes in.	Inside, the wall there faces only the 1.75 in air gap and the aft G10 plate, never the cells. Never on a long side wall.
V and R	V: the Gore M12 vent, the breathing inlet, high on the aft wall. R: the relief stub through the forward wall, high, 45 degrees up, duckbill lips out, discharge forward.	If a cell ever vents, the gas leaves away from the electronics. No screen, bug cap or flame mesh.

Dumb by design: cells and sensors only. Every board that thinks is in the BMS box. Five holes plus the fuse bolts and the BMS box's four bolts; none through the lid. Cells counted from the aft end, A1 to A16 and B1 to B16; which post each tap takes: Reference, Battery Tap Wiring 2026-10-03. Deleted, do not re-propose: heaters, gas sensors, the high-water sensor, the overboard relief duct. Battery switch off before anyone touches the mains.

Emergency bank: what is wired to what, and why

From Electronics and Wiring Plan v10.2 (Appendix A10, A3 entry 28, sec 7.6), Compute Bay Housing and Wiring Plan v10.2 (secs 4.2, 5.2, 11), Build Guide v10.2 secs 4.3 and 4.4, System Settings Sheet v10.2 sec 1, checked against Pending Amendments v10.3. Drawn 2026-10-02, rev 2026-10-09.



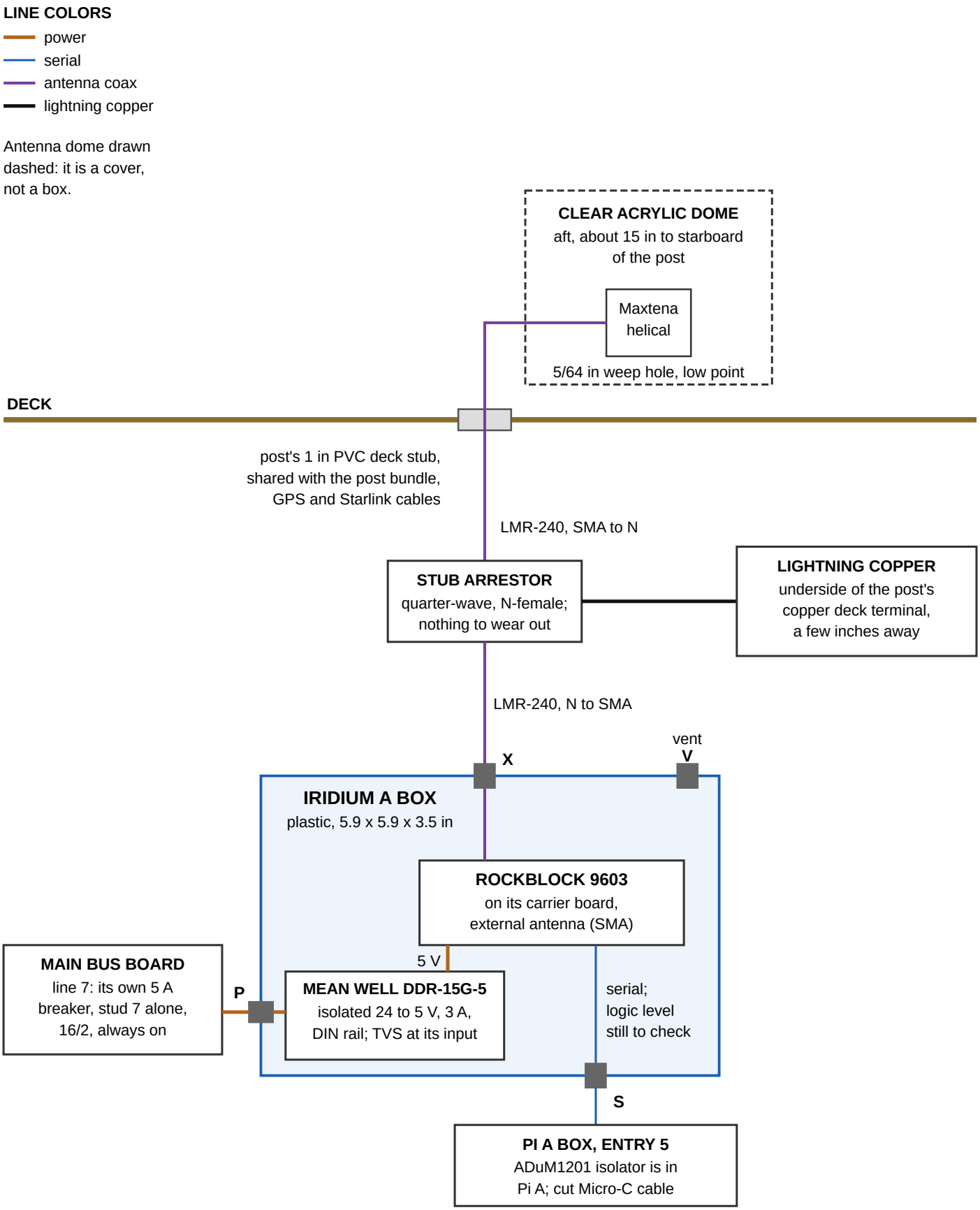
What each link is, and why

Link	What it is	Why
+ post to the strip	An inline 30 A ANL fuse within a few inches of the + post, then to the strip's + side. The − post goes straight to the strip's − side. Insulating boots on both M8 (5/16 in) posts.	The ANL protects the cable; the loads are tiny (about 25 to 32 Wh a day), so there is room to spare.
Strip to the Pi B box (A2 entry 1)	A fused + and − pair. Pi B's box also feeds WD-B (through its own D36V6F5) and the lightning detector. Open: the strip's fuse sizes for Pi B, Iridium B and the 75/10; the fuse sizing rule (Electronics sec 7.6) settles them. Not settled: Compute Bay 4.2 also puts a fuse in the Pi B box.	The backup computer must run when the main bank is lost. It is the only island that may never touch the main bank's copper.
Strip to the Iridium B box	A fused + and − pair, always on, never switched, to the box's isolated Mean Well DDR-15G-5. Fuse size open (above).	Iridium B is the backup island's voice to shore; no distribution failure may cut it.
Orion-Tr 24/24-5 to the strip	Its output, which must float, through its own 10 A fuse, a few inches away. Within about a foot of the Dyness, upright, dry (it is only IP43), on wood or G10 with no bond wire; meter its case to each negative on the bench.	The routine float and the monthly exercise recharge. Transformer isolated with a one-way gate, so a main-bus fault cannot drain or back-feed the bank.
Main bus board to the Orion-Tr input	16/2 across the boat from its own 10 A breaker (line 13, bar stud 6).	The only power bridge between the islands, and it is isolated.
Central node to the Orion-Tr remote terminal	A two-core run from relay channel 10 (A3 entry 28), normally open; daily timer and the monthly exercise recharge.	A dead central node leaves the Orion-Tr off, and the bank's own panels keep it charged.
Two 50 W panels to the SmartSolar 75/10, and the 75/10 to the strip	The panels in series into the 75/10; its battery output to the strip. Fuse size open (above).	The bank recharges even with the main bus or the central node dead.

A bought battery, not a built box. No hole schedule, no gland list; the real work is restraint: 42.6 lb at 20.9 in long must hold in a knockdown and a full inversion. Still open with the maker: whether the low-temperature cutoff blocks charging only or discharge too, and the standby draw (no concern on Boat 1's route). Also open (System Settings Sheet sec 1): how the monthly exercise discharges into main-bus loads when no power path joins the islands, and how the Dyness BMS reports it. Colors: orange +, black −, dashed orange solar input, blue the remote on/off wire.

Iridium A box: what is wired to what, and why

From Electronics and Wiring Plan v10.2 (Appendix A11, sec 6.5, 7.6), Lightning Ground System Guide v10.2 sec 7.1, Instrument Post Guide v10.2 secs 11.1 and 16.1, checked against Pending Amendments v10.3. Drawn 2026-10-02, rev 2026-10-09.



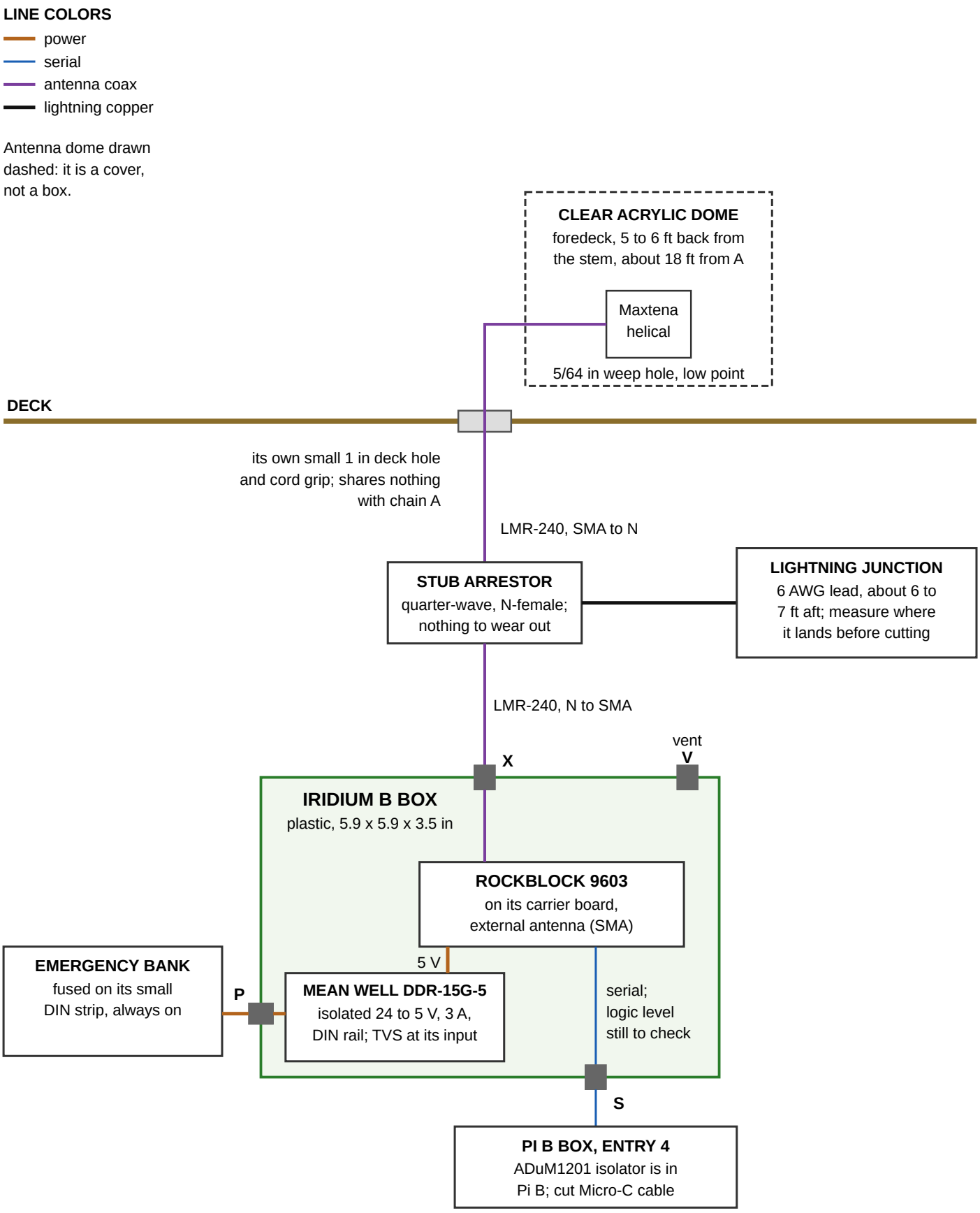
What each link is, and why

Link	What it is	Why
Main bus board to entry P	24 V, always on: 16/2 on its own 5 A auto-reset breaker (line 7, stud 7 alone). Inside: a TVS diode and the Mean Well DDR-15G-5 isolated converter (9 to 36 V in, 5 V 3 A out against the RockBLOCK's 0.5 A at most, 4,000 V between input and output, screw terminals) on a short DIN rail on the mounting plate, feeding the RockBLOCK.	A breaker comes back after a passing fault; a fuse would leave the voice dead (Mike, 2026-09-28). The 5 A breaker is on hand. The converter stands about 2-1/2 in off the plate, so the box is a TICONN IP67, 5.9 x 5.9 x 3.5 in, with its mounting plate.
Entry S to Pi A (its entry 5)	Serial line on a cut Micro-C cable. The ADuM1201 isolator chip sits inside the Pi A box, not here.	Isolation beats clamping on a data line. Open: the RockBLOCK's serial logic level; reading its datasheet before wiring settles it.
Entry X to the stub arrestor	LMR-240 coax, SMA to N, straight to the quarter-wave stub (a shaped coax stub that shorts a surge but passes the signal).	The stub is the only coax protection, because it cannot wear out. No coax safing relays anywhere aboard.
Stub arrestor to the lightning copper	The stub lands on the underside of the post's copper deck terminal, a few inches from the deck stub.	A short path to ground for a surge on the coax. Meter it center to shield at first setup and record the reading: that is the post-strike check.
Arrestor to the antenna	LMR-240, SMA to N, up through the post's 1 in deck stub to the Maxtena M1621HCT-P helical under its own clear dome, glued to a pad, never unplugged (no bulkhead connector).	The two Iridium chains share no dome, deck hole, cable, gland, arrestor or fuse, so one side-flash cannot take both.

Voice number one: main bank, always on, near Pi A. Stubs: two on hand, one for each chain (Mike, 2026-10-07). The converter is isolated (Mike, 2026-10-02; the part is Claude's pick, 2026-10-09): the stub ties the coax shield to the copper, and the isolated converter stops that tie at the Iridium side, so the main negative is not tied to the copper a second time. Colors: orange power, blue serial, purple coax, black lightning copper.

Iridium B box: what is wired to what, and why

From Electronics and Wiring Plan v10.2 (A10, A11, sec 6.5, 7.6), Lightning Ground System Guide sec 7.1, Instrument Post Guide secs 11.1 and 16.1, Compute Bay Plan sec 5.2, checked against Pending Amendments v10.3. Drawn 2026-10-02, rev 2026-10-09.



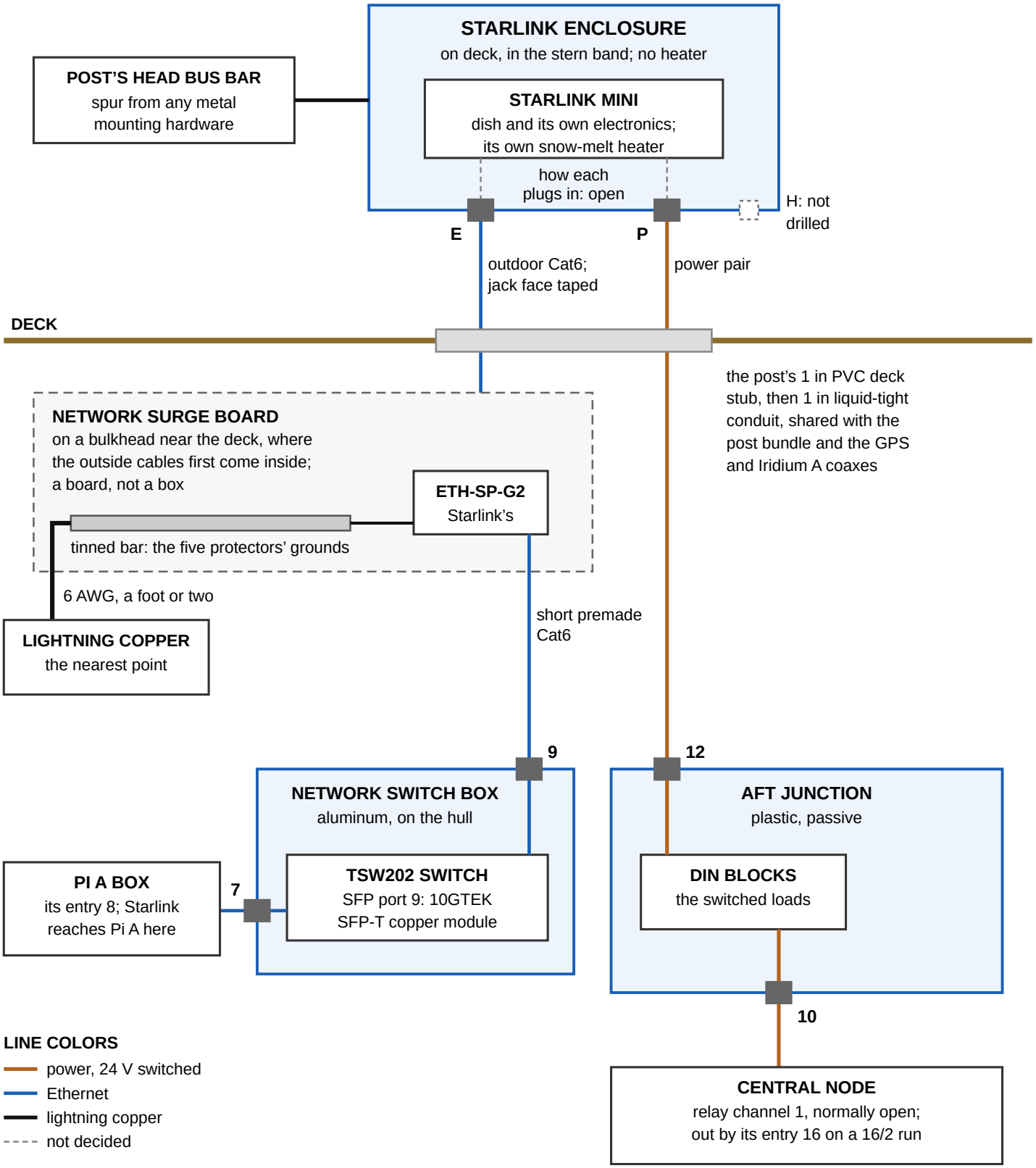
What each link is, and why

Link	What it is	Why
Emergency bank to entry P	Always on, from the Dyness bank's small fused DIN strip (A10). Inside: a TVS diode and the same Mean Well DDR-15G-5 isolated 24 to 5 V converter as Iridium A, on a short DIN rail, in the same TICONN 5.9 x 5.9 x 3.5 in box.	Lives wholly on the emergency island, so a fault that silences voice A cannot reach voice B.
Entry S to Pi B (its entry 4)	Serial line on a cut Micro-C cable. The ADuM1201 isolator sits inside the Pi B box.	Keeps the island's data links isolated. Open: the serial logic level; the RockBLOCK datasheet settles it.
Entry X to the stub arrestor	LMR-240 coax, SMA to N, to its own quarter-wave stub, below deck at its own hull entry.	Nothing in a stub can wear out; it works or is plainly broken.
Stub arrestor to the lightning junction	A 6 AWG lead, about 6 to 7 ft aft to the junction. Measure where it lands before cutting the wire.	Gives a surge on B's coax its own short way to the copper, apart from chain A.
Arrestor to the antenna	Up through its own small 1 in deck hole with a cord grip, to its own Maxtena helical under its own clear dome on the foredeck.	Forward and apart from A: no shared dome, hole, cable, gland, arrestor or fuse.

Voice number two: emergency bank, always on, near Pi B, nothing shared with voice A. The island's negative must float, and the stub ties the coax shield to the copper: the isolated converter stops that tie at the Iridium side, so the island stays off the copper. Colors: orange power, blue serial, purple coax, black lightning copper.

Starlink enclosure: what is wired to what, and why

From Electronics and Wiring Plan v10.2 (A3, A6, A6a, A13, secs 6.1, 6.3), Lightning Ground System Guide v10.2 secs 6.2 and 7.4, Compute Bay Plan v10.2 sec 11, Wire and Cable Buy List, checked against Pending Amendments v10.3. Drawn 2026-10-02, rev 2026-10-09.



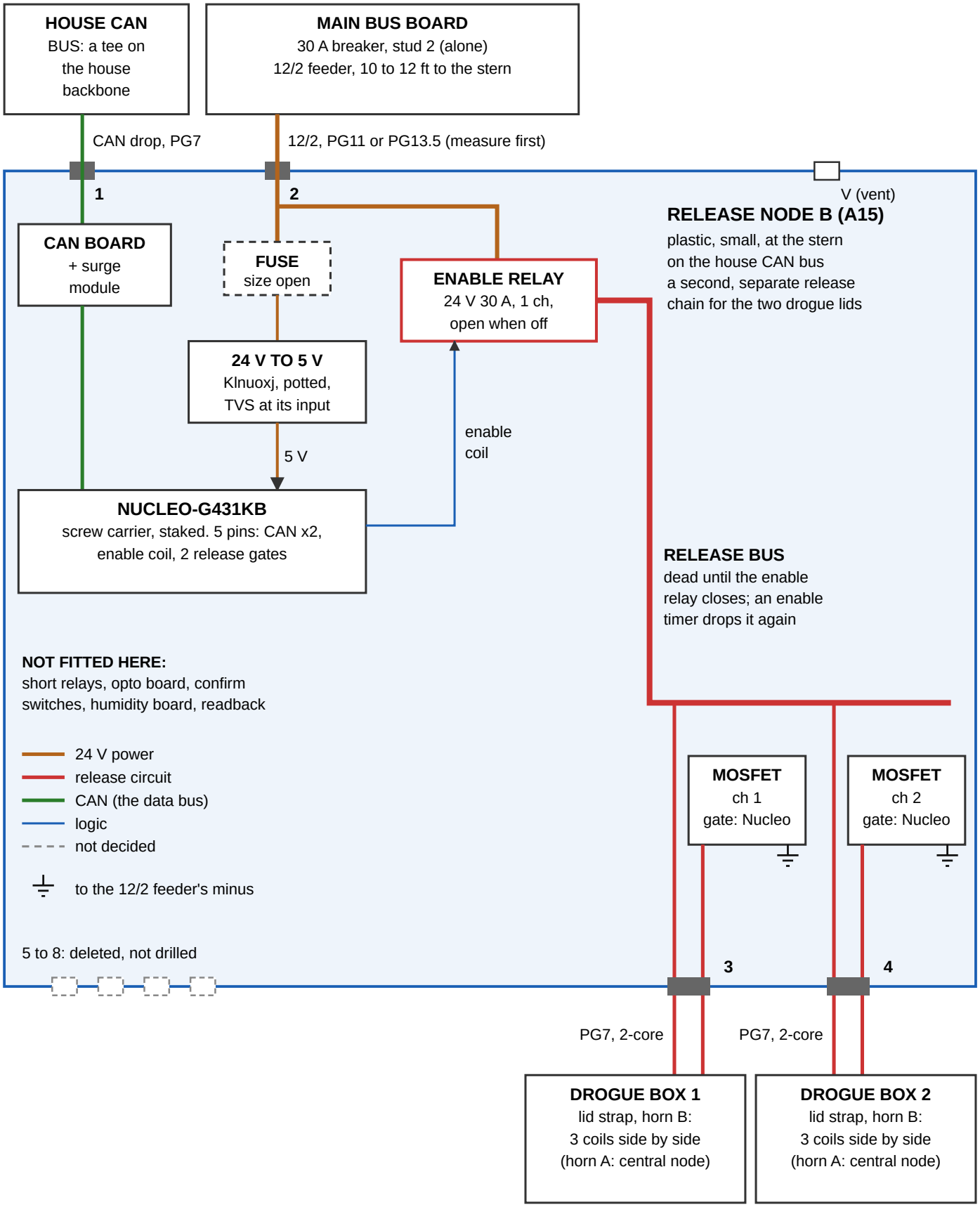
What each link is, and why

Link	What it is	Why
Enclosure entry E to switch box entry 9	Outdoor Cat6 from the Mini, out through E on a bulkhead jack (its outside face greased and wrapped in self-fusing silicone tape), down the post's deck stub and conduit to its Ubiquiti ETH-SP-G2 on the network surge board near the deck, then a short premade Cat6 to the switch box's jack 9 and the TSW202's SFP port 9 on a 10GTEK SFP-T copper module.	Starlink is expendable; the protector saves the switch, which also carries the cameras and the Pi to Pi link. Keep the cables before the protectors apart from those after them.
Surge board to the lightning copper	The five protectors' ground leads on one small tinned bus bar on the board; one 6 AWG spur, short and straight, a foot or two at most, to the nearest point on the lightning copper.	One short ground for all five (Lightning Guide bonding list, item 11). Open: where the copper runs near that bulkhead; check at the boat.
Central node relay channel 1 to entry P	Normally open channel 1 switches 24 V. The run leaves the node by its entry 16, crosses the aft junction's DIN blocks (in by entry 10), and goes out by entry 12, the Starlink power bundle, up through the deck stub to the enclosure's PG9 entry P.	So the Pi can shed Starlink or power-cycle it; load shedding drops it first as the bank runs down. Open: its wire, 14/2 in Wire List A8 against one of the 16/2 runs in C2.
Switch port 7 to Pi A	Cat6 from the TSW202's port 7, out by the switch box's jack 7, to Pi A's entry 8.	Starlink reaches Pi A through the one switch, which is always on, never on a relay channel.
Inside the enclosure (dashed)	How the Cat6 and the power pair plug into the Starlink Mini is not written.	Open: settle it before the enclosure is drilled.
Mount hardware to the post's head bus bar	Any metal mounting hardware gets one spur to the post's head bus bar (Lightning Guide 6.2, item 9).	Keeps a side-flash on the mount off the cables.
Entry H	Not drilled: no enclosure heater. Deleted, do not re-propose.	The dish melts its own snow.

Declared sacrificial: no coax, no arrestor, no heater. Losing it costs bandwidth, not the boat; Iridium is the guaranteed floor. Colors: orange power, blue Ethernet, black lightning copper, grey dashed not decided; a dashed outline is a board, not a box.

Release Node B: what is wired to what, and why

From Electronics Plan v10.2 secs 4.2, 7.6, App. A15; Compute Bay Plan v10.2 sec 10.3; Drogue Box Guide sec 5; checked against Pending Amendments v10.3. Drawn 2026-10-02, rev 2026-10-09.



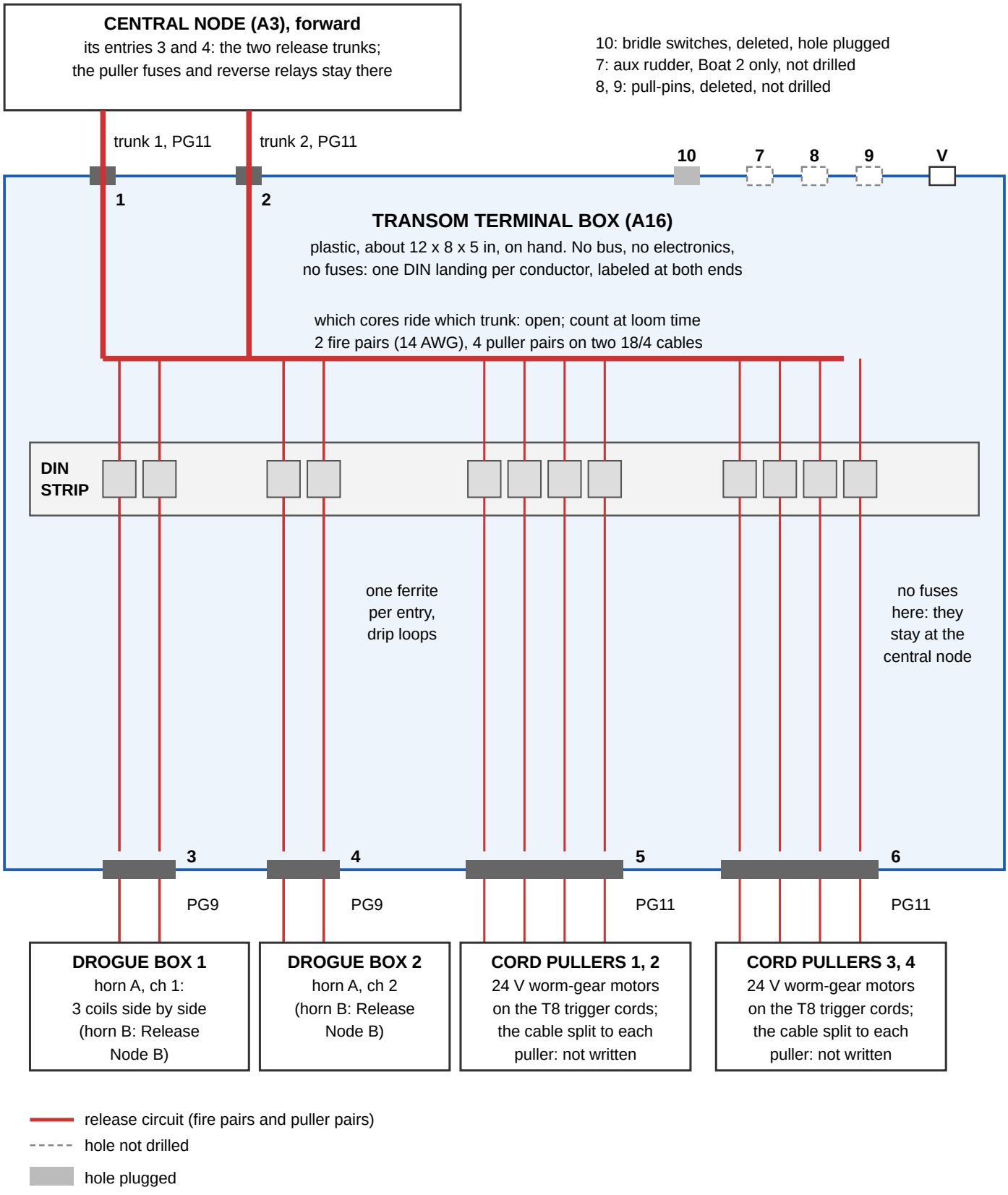
What each link is, and why

Link	What it is	Why
Main bus board to the node (entry 2)	12/2 feeder on its own 30 A breaker, stud 2, alone, 10 to 12 ft to the stern. Gland PG11 or PG13.5: measure the jacket first. One landing feeds the enable relay; the potted 24 to 5 V converter (TVS at its input) feeds the Nucleo.	Its own branch, so a fault on the central node's feeds cannot silence this chain. A breaker, not a fuse, so a passing fault does not kill releases for the mission.
Fuse inside the box	Listed in Appendix A15 contents. Its size and whether it sits ahead of the converter only or the enable relay too: not written (drawn dashed).	Open: whether the release feed’s fuse holder is needed, with the feeder on a 30 A breaker (Compute Bay 10.3, Electronics plan A15); a decision settles it.
CAN house drop (entry 1)	Micro-C drop from the last tee on the house backbone, PG7 (this node is the bus end: the terminator plug sits on that tee), through a Taidacent RS-12V/2S surge module to the CAN board and the Nucleo.	A different bus from the central node, so one dead bus cannot remove every release. Pi A commands both.
Enable relay to the release bus	One 24 V 30 A single-channel relay module, open when unpowered, coil on a Nucleo pin. It is the only thing that puts 24 V on the release bus. An enable timer drops it if no release follows.	Condition 1 of 2.
Release bus to drogue box 1 (entry 3)	2-core cable, PG7, its own route: release bus to horn B's three coils side by side, back to MOSFET switch ch 1, low side, gate on a Nucleo pin.	Condition 2 of 2. Horn A of the same lid is the central node's; either horn alone cuts the strap.
Release bus to drogue box 2 (entry 4)	Same as entry 3, MOSFET ch 2.	Same as entry 3.
Entries 5 to 8	Not drilled: 5 and 6, the pull-pin stations, deleted (Boat 1 has no pins); 7 and 8, the opto sense leads, deleted.	Four holes and a vent. No short relays, no opto board, no readback.

The same two-step lock as the central node, on separate parts, power, bus and routes. Close the enable relay, then turn on the channel's MOSFET; neither alone does anything, and unpowered neither is possible. Fire one release bus at a time: the central node's first. Colors: orange 24 V, red release circuit, green CAN bus (the boat's data wire), blue logic; grey dashed means not decided.

Transom terminal box: what is wired to what, and why

From Electronics Plan v10.2 App. A3 and A16; Wire and Cable Buy List C3; Drogue Box Guide secs 5, 6; checked against Pending Amendments v10.3. Drawn 2026-10-02, rev 2026-10-09.



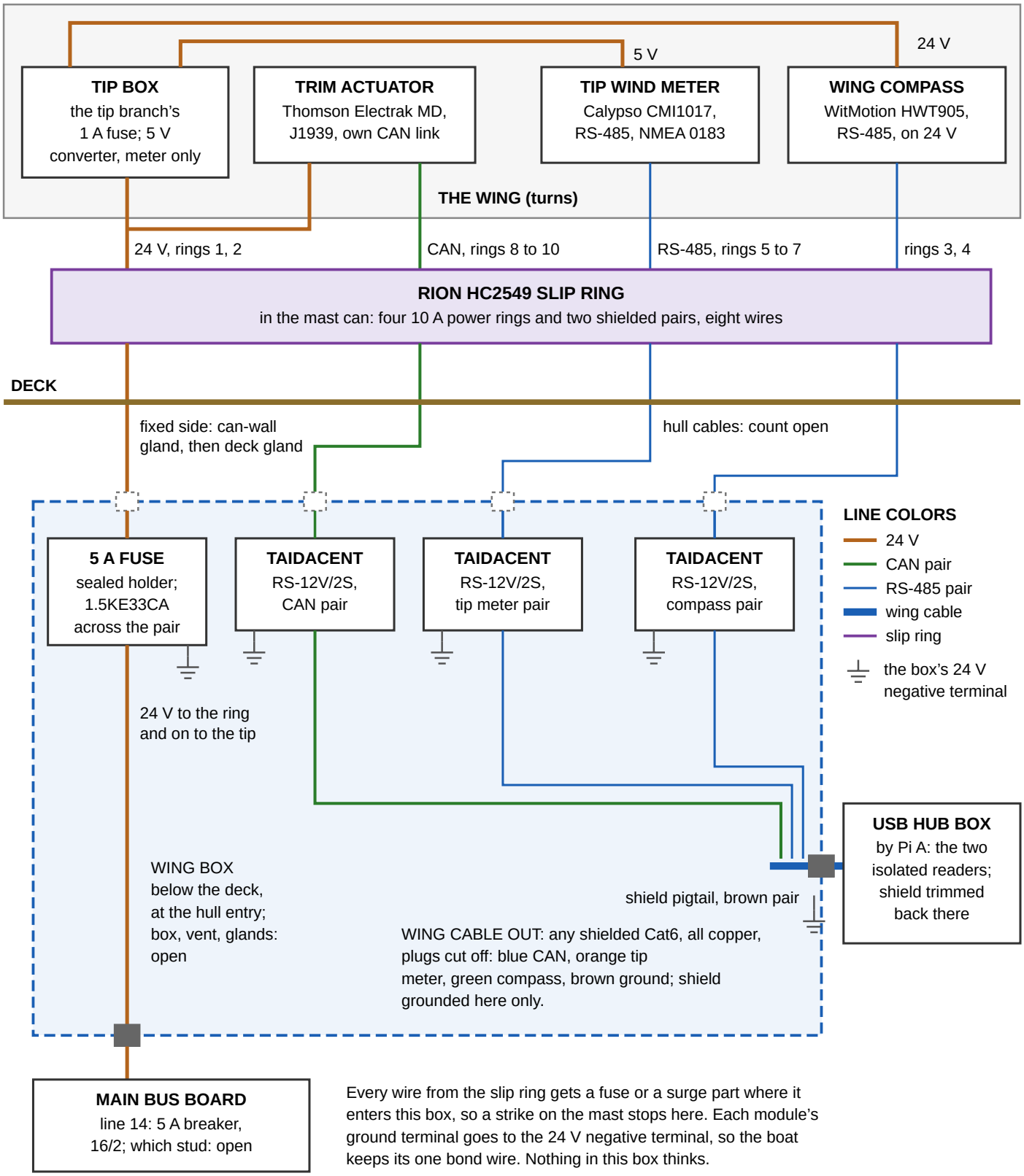
What each link is, and why

Link	What it is	Why
Central node to this box (entries 1, 2)	Two release trunks, PG11 each, from central node entries 3 and 4: the two drogue fire pairs (horn A, 14 AWG, on the 14/4 bought) and the four cord puller power pairs on two 18 AWG 4-core cables, one per pair of pullers; 22 AWG for the rest. Count cores at loom time. Open: which cores ride which trunk.	Two trunks forward instead of four long runs, about two holes fewer in the central node wall.
Inside: the DIN strip	One landing per conductor, a label at both ends. No electronics, no fuses; the fuses stay at the central node end.	A stern fault is found with a meter at the strip, not by pulling a trunk. Nothing in here can fail while powered. Cost: two extra screw joints on every conductor.
To drogue box 1 and 2 (entries 3, 4)	One pair each, PG9, to horn A's three coils side by side on each lid strap (12.5 A per horn). Each through its own potted gland low on the transom.	The central node's half of each lid. Horn B goes direct from Release Node B on a separate route, never in the same gland, loom or trunk.
To the cord pullers (entries 5, 6)	PG11 each: one 18 AWG 4-core tinned cable per gland, each carrying two pullers' power pairs (Mike, 2026-10-02). How each cable splits to its two pullers is not written.	The four 24 V worm-gear pullers wind in the T8 trigger cords. Single path: no second chain reaches them.
Holes not used	7: aux-rudder release, Boat 2 only, not drilled. 8, 9: pull-pin runs, deleted, not drilled. 10: bridle tension switches, deleted; the PG9 is plugged.	The speed drop and the aft camera confirm the drogue is out, so no confirm or sense wires come back.

Passive: a strip in a box, nothing that can fail while powered. Every conductor lands once and is labeled at both ends; chafe-sleeve the trunks where they enter, drip loops on everything, one ferrite per entry. Colors: red release circuit; grey dashed a hole not drilled.

Wing box: what is wired to what, and why

From Electronics and Wiring Plan v10.2 (Appendix A1a, A17, sec 7.6), Wing Power System v10.2 (secs 1A, 8.7), Compute Bay Plan v10.2 secs 10.2 and 14.1, Wire and Cable Buy List C8, checked against Pending Amendments v10.3. Drawn 2026-10-02, rev 2026-10-09.



Every wire from the slip ring gets a fuse or a surge part where it enters this box, so a strike on the mast stops here. Each module's ground terminal goes to the 24 V negative terminal, so the boat keeps its one bond wire. Nothing in this box thinks.

What each link is, and why

Link	What it is	Why
24 V feed in	16/2 from its own 5 A breaker on the branch bar (line 14), then the box's own 5 A fuse in a sealed holder and a 1.5KE33CA surge diode across the pair (it conducts from 31.4 V, either way round). Out on rings 1 and 2 to the actuator and the tip branch's 1 A fuse.	The actuator draws 2.6 A at most, under 2 mA asleep, so its feed is not switched. A shorted diode blows the 5 A fuse: the wing loses trim, the hull is never shorted. Open: which stud, the end stud or stud 3; Mike's call settles it.
The tip branch	At the tip, after its 1 A fuse: the compass runs on the 24 V (9 to 36 V, under 40 mA), and a small converter makes 5 V for the tip meter alone.	Never 24 V on the Calypso: it takes 3.3 to 18 V. No 5 V pair crosses the ring.
CAN pair (rings 8 to 10)	The actuator's own short CAN link (J1939) through a Taidacent RS-12V/2S surge module, then the wing cable's blue pair to the DSD TECH SH-C30G in the hub box. 120 ohm at each end.	Kept off the boat's two CAN buses. A strike down the mast stops at the module.
Tip meter RS-485 (rings 5 to 7)	The Calypso CMI1017's plain NMEA 0183 wind sentences through a second Taidacent, then the orange pair to the Waveshare 2-channel reader. Terminators off.	The wing-tip cross-check on the post wind meter, and the backup if the post is lost.
Compass RS-485 (rings 3 and 4)	The WitMotion HWT905's own pair on the ring's two spare power rings, through a third Taidacent, then the green pair to the reader's other channel.	Its turn rate feeds the rate damper; its heading minus the hull's gives the wing angle. No angle sensor in the can. Its own pair, so a fault on the meter's pair cannot silence it.
Wing cable to the hub box	One shielded Cat6 cable, all copper (Mike, 2026-10-09), plugs cut off, one gland at each end. Blue: CAN H solid, CAN L white. Orange and green: A solid, B white. Brown: the ground, both wires, on the 24 V negative terminal here.	The isolated readers' signal side floats, so the brown pair gives them the sensors' reference.
Shields and grounds	The cable's shield: a short sleeved pigtail on this box's 24 V negative terminal, its one ground terminal, with the brown pair and the three modules' ground terminals; any pair foils folded back and trimmed. At the hub box the shield is trimmed back and sleeved. The ring's two shielded leads are grounded at the hull end too.	The strike comes in here, so the shield drains here. Grounded at the hub end it would carry the surge in beside Pi A; at both ends it would close a loop through the boat's wiring.
The box itself	Below the deck, where the wing's wires enter the hull; the ring's fixed-side cables leave the can by its wall gland and come down through their own deck gland straight into it.	Open: the box's material, vent and glands, and how many hull cables carry the eight wires; picking the box and the cables settles them.

Nothing in the wing box thinks. A direct hit may kill the actuator, the tip meter, the compass or the ring; that costs trim, not the boat, because the wing turns edge-on with no power. Colors: orange 24 V, green CAN, blue RS-485 and the wing cable, purple the slip ring; the ground mark is the box's 24 V negative terminal; dashed outline: box not yet picked.