DETECTOR MINI-BOX · PARTS

Boat 1 · A12 · v10.5 · tiny plastic box, within 3 ft of the Pi B box, touching no metal

A



Lightning board, Playing With Fusion SEN-39003 (AS3935)

Hears lightning up to about 25 miles off; raises IRQ for each strike.

About 1 x 0.9 in. 2.4 to 5.5 V, so 5 V straight. Factory tuned 88 pF. I2C 0x03. Two 4-40 holes.

1 · have

B



8-way screw block, 0.1 in pitch (Hxchen)

Soldered onto the board's pin row at the bench, so every core lands under a screw.

8 ways, 0.1 in (2.54 mm) pitch.

1 · have (kit)

C

two short wires

Two short jumper wires

On the back of the board: SI to VDD (picks I2C), CS to GND.

22 AWG hookup offcuts, soldered at the bench, not under the screws.

2 · have (kit)

D

gray round cable, 6 cores and a drain

Lead to WD-B: Belden 6504FE

5 V, ground, IRQ, SCL, SDA between the board and WD-B in the Pi B box.

22 AWG, 6 cores, foil shield and drain, about 0.175 in across. Under 3 ft. Five cores used.

1 · have (Mike's roll)

E



Cable gland PG7, nylon

Seals the lead where it enters. Another PG7 at Pi B entry 6.

Grips 1/8 to 1/4 in. 1/2 in hole in the bottom wall.

1 · have

F

white nylon screws and spacers

Nylon 4-40 screws, nuts, spacers

Hold the board off the box floor. Nothing metal.

4-40 nylon, about 1/2 in long, with nylon spacers.

2 sets · check

G

small plastic box

The tiny plastic box

Keeps the board dry; lets the radio signal through.

Not picked. About 3.5 x 2.5 x 1.5 in or bigger, IP65 or better, plastic only.

1 · to pick (open)

H

insulated ferrules

Ferrules for 22 AWG

One on each core under its screw.

0.5 mm2 (22 AWG) insulated.

5 · have (kit)

I

brush-on varnish

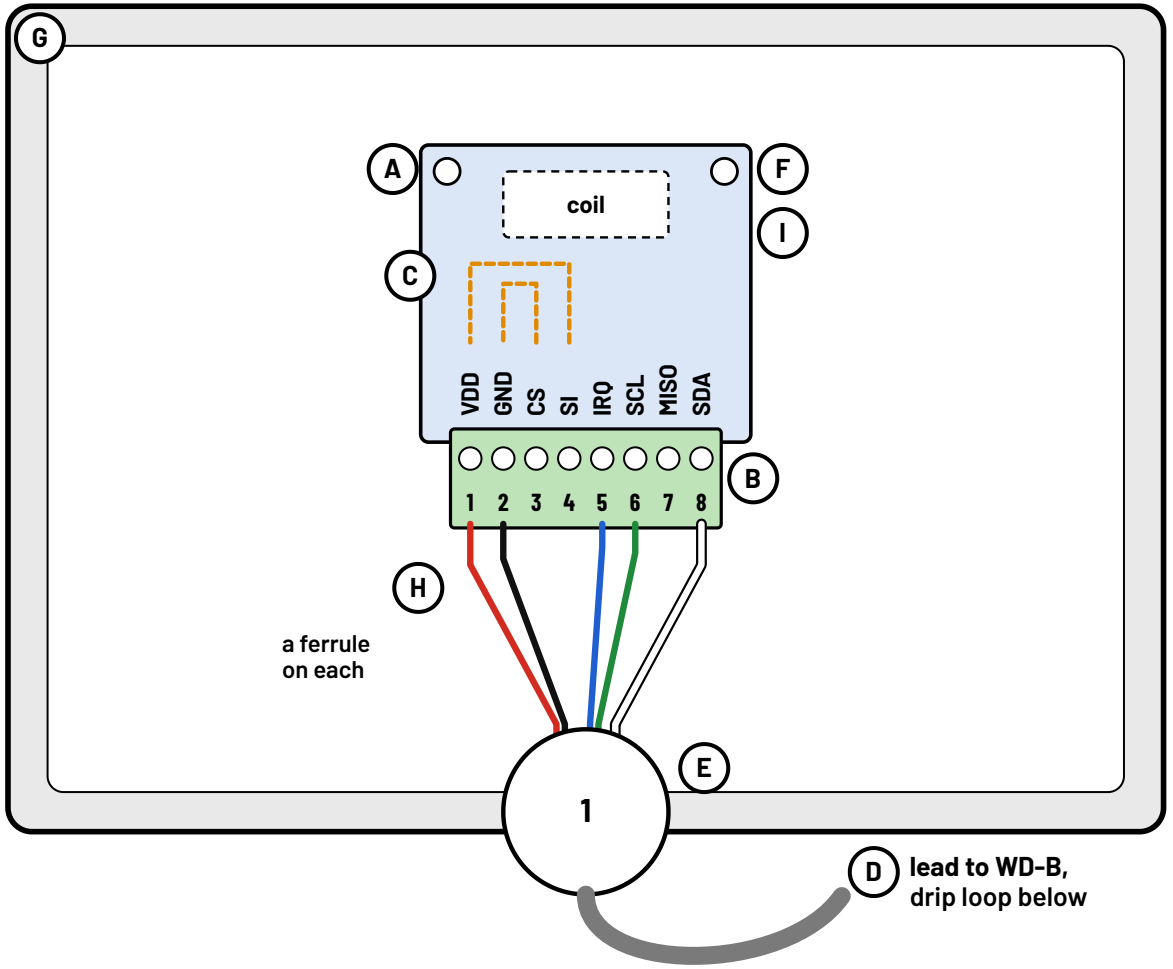
Conformal coat

Thin varnish over the board, as every board on the boat gets.

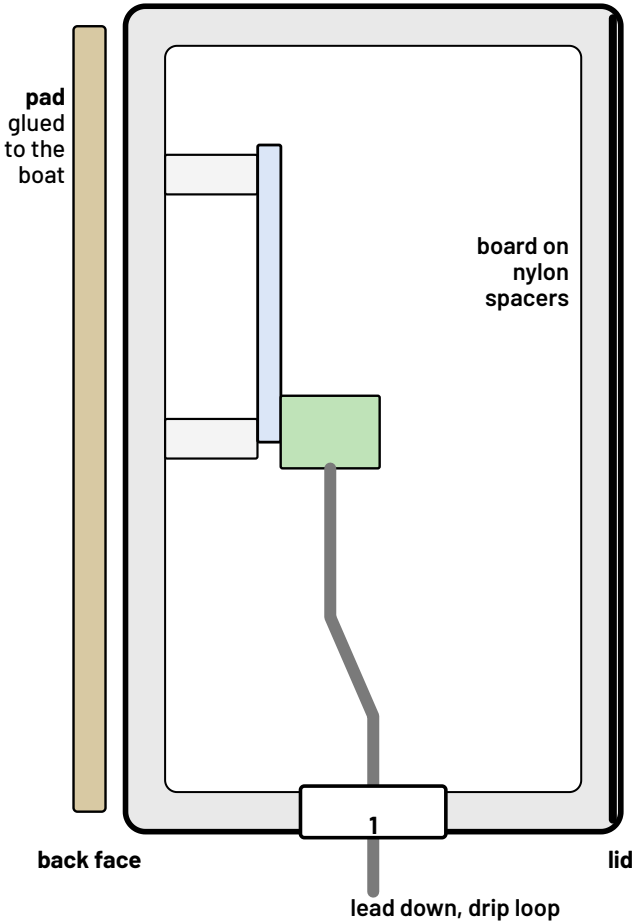
After the jumpers are soldered and the flux is cleaned off.

1 · check

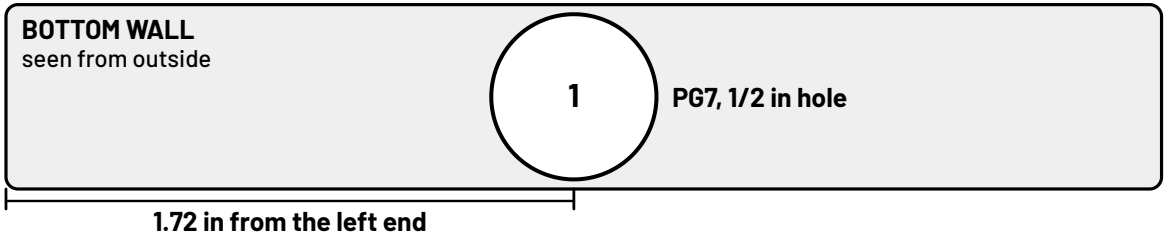
TOP WALL: no holes



SIDE VIEW, cut through



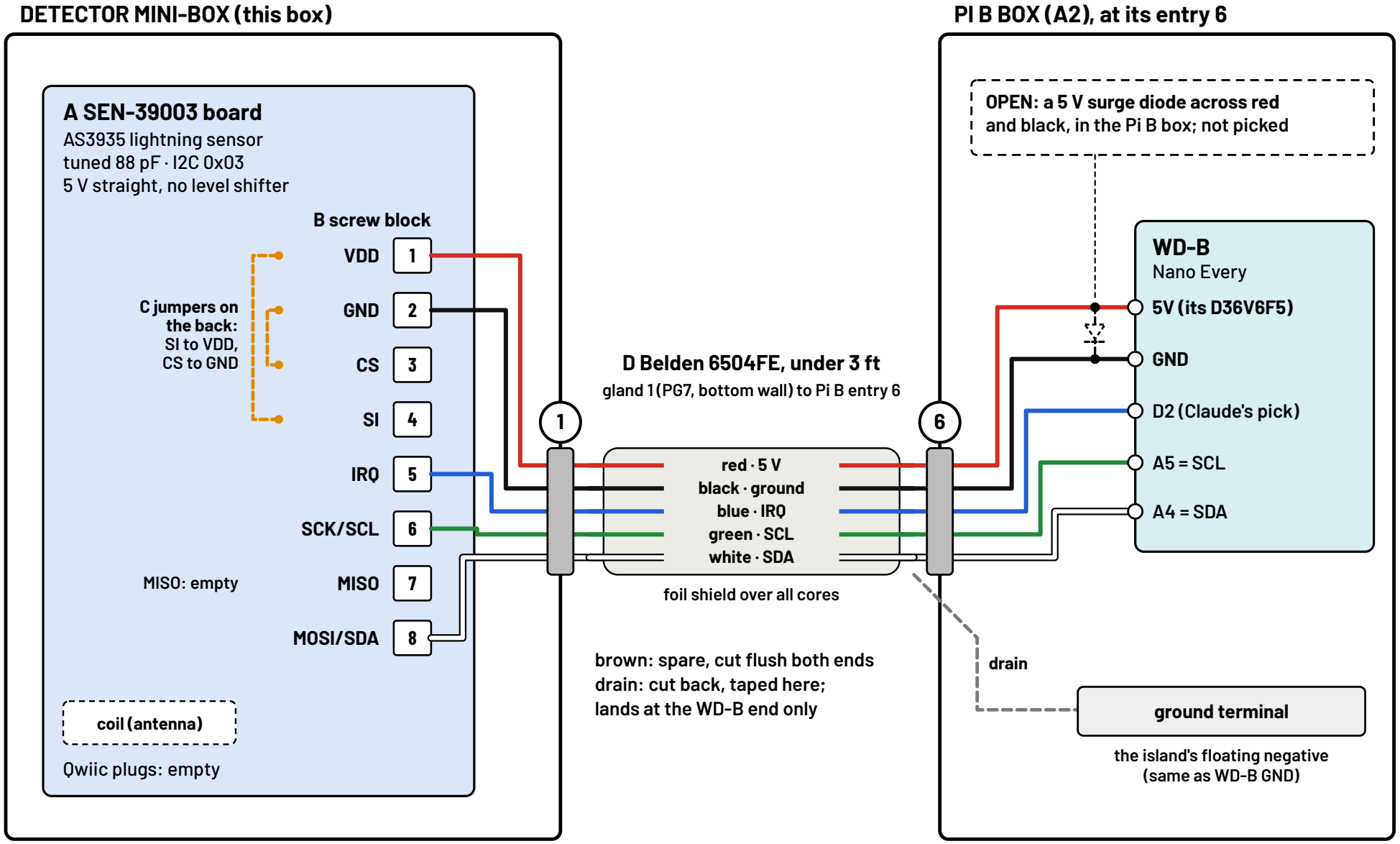
SCREWS, 1 TO 8
1 VDD · 2 GND · 3 CS · 4 SI
5 IRQ · 6 SCK/SCL · 7 MISO
8 MOSI/SDA
Used: 1, 2, 5, 6, 8
Empty: 3, 4 (jumpers on the back), 7
Coil end away from the gland
Nothing metal: nylon screws, gland
Letters = page 1



centered in the wall's 1.5 in depth (0.75 in up from the back)

DETECTOR MINI-BOX · WIRING

numbers in boxes = screws on the board, numbers in circles = glands · not to scale



red, 5 V · black, ground · blue, IRQ · green, SCL · jumper on the back · lines in the lead's real core colors; white SDA drawn outlined

DETECTOR MINI-BOX · EVERY WIRE

screws numbered 1 to 8 along the pin row, as on pages 2 and 3

SCREW BLOCK B ON THE BOARD, SCREW BY SCREW

Screw	Pin	What lands
1	VDD	red core (5 V from WD-B), on a ferrule. Jumper from SI on the back
2	GND	black core (ground), on a ferrule. Jumper from CS on the back
3	CS	empty (held low by its jumper to GND on the back)
4	SI	empty (held high by its jumper to VDD on the back: picks I2C)
5	IRQ	blue core: the strike signal to WD-B D2
6	SCK/SCL	green core: I2C clock to WD-B A5
7	MISO	empty (SPI only)
8	MOSI/SDA	white core: I2C data to WD-B A4

ON THE BACK OF THE BOARD (SOLDERED, NOT UNDER A SCREW)

Jumper	Joins	Why
C1	SI to VDD	picks I2C
C2	CS to GND	CS held low, not used on I2C

THE LEAD D, CORE BY CORE (GLAND 1 HERE, PI B ENTRY 6 THERE)

Core	This end	WD-B end (Pi B box)	Carries
red	screw 1, VDD	WD-B 5 V (its D36V6F5)	5 V
black	screw 2, GND	the island's floating negative	ground
blue	screw 5, IRQ	WD-B D2	strike heard
green	screw 6, SCK/SCL	WD-B A5	I2C clock
white	screw 8, MOSI/SDA	WD-B A4	I2C data
brown	cut flush in the jacket	cut flush in the jacket	spare
drain	cut back and taped	ground terminal (floating negative)	shield

BEFORE WIRING, AT THE BENCH

- Read the board's bag label: **88 pF**. Note it for the software (register value 11).
- Solder the 8-way screw block onto the pin row.
- Solder the two jumpers on the back: SI to VDD, CS to GND. Clean the flux off.
- If wanted, a small dab of West epoxy or high-temp hot glue over the jumpers, on the pin-row half only, off the coil (MA5532) and the parts beside it.
- Conformal coat the board.

SETTINGS (SYSTEM SETTINGS SHEET SEC 10)

- I2C address 0x03. Tuning value 88 pF (register value 11).
- Strike signal on WD-B pin D2.

WIRE AND ENDS

Belden cores are 22 AWG: one core per screw, each on a 22 AWG ferrule. MISO and both Qwiic plugs stay empty. Tighten the gland on the jacket, grease on the insert, drip loop below. No ferrite (the lead stays in the cabin). Check the screws tight once more a week or two after wiring (Electronics plan A12).

STILL OPEN

- The 5 V surge diode on this lead, across red and black inside the Pi B box: a 5 V part, not picked.
- D2 for the strike signal is Claude's pick: no WD-B pin map yet.
- Which tiny plastic box: not picked. Any small IP65 or better plastic box with room for the board and one PG7.
- Box Wiring Sheets v10.5 (page 39) asks for the false-trigger rate with VESC A running before the board is trusted here; if it fails, the fallback is a small forward node with an isolated transceiver.