

Cyber Apocalypse 2026 — Hardware — What the Shard Displayed

Category: Hardware | Challenge: What the Shard Displayed

HTB{3v3ry_crow_w3ars_h3r_3y3s}

Challenge text

The Signet shattered, the great houses fell to arguing with steel, and Alyss, Queen of Quiet Marches, began sending her dead to watch the living. One of her crows fell over our winter line, a maker's device bound beneath its wing, an eye she threaded through dead flesh to count our banners. Fed a current, it still wakes: it checks its roost, marks the hour it last saw us, and paints what it saw onto its pane. Reconstruct it, and learn what her eye found of us before the Hollow Host moves.

The flavour points at a small device that, when powered ("fed a current"), talks to peripherals and finally **"paints what it saw onto its pane"** — it draws to a display. We are given `capture.sr`, a sigrok/PulseView logic-analyzer capture, and must reconstruct what was drawn.

Recon

A `.sr` file is a ZIP container. Its `metadata` declares 8 digital probes, **2 MHz** sample rate, `unitsize=1` (1 byte/sample), with only **D0** and **D1** named.

Concatenating the `logic-1-*` chunks yields 4,000,000 samples (2 s). Channel activity:

Channel	High %	Notes
D0	90.1%	fast clock, 64,642 transitions
D1	84.3%	slower data, 4,256 transitions

D2, D3	0%	idle low
D4–D7	100%	idle high (unused pull-ups)

Two idle-high lines, one a fast clock, one slower data → **I²C**. D0 = **SCL**, D1 = **SDA**.

Decoding I²C

A short decoder detects START (SDA falls while SCL high), STOP (SDA rises while SCL high) and samples SDA on each SCL rising edge, grouping 9 bits (8 data + ACK). The first transaction:

```
START 0x78 0x00 0xAE 0xD5 0x80 0xA8 0x3F 0xD3 0x00 0x40 0x8D 0x14
      0x20 0x00 0xA1 0xC8 0xDA 0x12 0x81 0xCF 0xD9 0xF1 0xDB 0x4
      0xA4 0xA6 0xAF STOP
```

0x78 = address **0x3C** <<1 → an **SSD1306 OLED**. **0x00** control byte = commands follow. The bytes are the canonical **128×64 SSD1306 init sequence** (**0xAE** off, **0xA8 0x3F** mux=64, **0x8D 0x14** charge pump, **0x20 0x00** horizontal addressing, **0xAF** on).

Reconstructing the screen

SSD1306 GDDRAM is 8 pages × 128 columns, each data byte = 8 vertical pixels (LSB top). A small emulator tracks addressing/page/column commands and writes the **0x40** data streams into a framebuffer. Rendering the 3,116 data bytes gives:

HTB{3v3ry_crow_
w3ars_h3r_3y3s}

The screen reads:

HTB{3v3ry_crow_w3ars_h3r_3y3s}

Flag

HTB{3v3ry_crow_w3ars_h3r_3y3s}