PASSWORD BREACH
FRAME VERSION

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Version : 2023-06-14

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GENERAL IMPORTANT INFORMATION

This short section must be read for proper operation.

PASSWORD BREACH (2021)

BY RAFAEL LOZANO-HEMMER

Technique

Electronic-paper displays, ESP32 microcontrollers, WiFi network, custom-made software.

Description

In "Password Breach," passwords extracted from salient historical data breaches are presented as an additive smear on 77 small electronic-paper displays which synchronise and reset intermittently. The breaches include the Panama Papers, Ashley Madison, and RockYou2021.

Infamous large-scale password breaches, such as those that affected the companies RockYou and Ashley Madison reveal the vulnerability and interconnectedness of digital and lived realities. As such, "Password Breach" brings to the fore how random, intuitive, or personalised combinations of 6 to 20 characters are heavily relied-upon, yet fallible gatekeepers of private caches of data whose stakes range from the personal to the global.

Through displaying these private "codes" in public space in seemingly random sequences, "Password Breach" reveals curious aspects of human thought processes, which draw upon nostalgia, fetish, taboo, and tenderness to build digital locks for private information.

Operation

Please refer to <u>Appendix I - Installation</u> for detailed system information, glossary of terms, and wiring diagram.

Note: The e-paper displays and the ESP32 microcontrollers should be assembled together. They will be referred to in this manual as a "module" (see: <u>Glossary of Components</u>).

1. Power on the included network router. It should take around 2 minutes to boot.

2. Open the drawer by unscrewing the two screws at the bottom of the artwork see Fig 2. Drawer

3. With the power buttons within the drawer turned off, plug the two power supplies into the power bar within the drawer of the piece.

4. Plug the power bar's cord into an outlet.

5. To turn the piece ON or OFF, press the power button on the bottom of the drawer.

6. If the network router is properly set up, the modules should connect automatically.

Maintenance

Please do not clean display surfaces with Windex or soap. Use a lint-free cloth and LCD screen liquid cleaner, such as Kensington Screen Guardian found in most computer stores. While cleaning the displays, avoid applying too much pressure onto its surface, otherwise the displays could swivel and it will mess up the alignment of the artwork.

The frame should be cleaned only with microfiber cloths or dusters. No water should be applied as it will damage the electronics and the paint. If necessary compressed air can be applied underneath the electronics sparingly to remove dust.

We recommend cleaning the piece at least every two months.

Placement Instructions

The bottom of the French Cleat must be set at 1.75m from the ground for the artwork to be centred at 1.5m.

A minimum of 4 screws lining up with studs in the wall are required. Holes can be added in the french cleat to accommodate the position of studs. **See *Fig 1. French Cleat.***

The bottom side of the artwork has a drawer which should face downwards. **See *Fig 2-3. for what the back of the piece looks like***.

Wear cotton white gloves when hanging the artwork on the cleat.
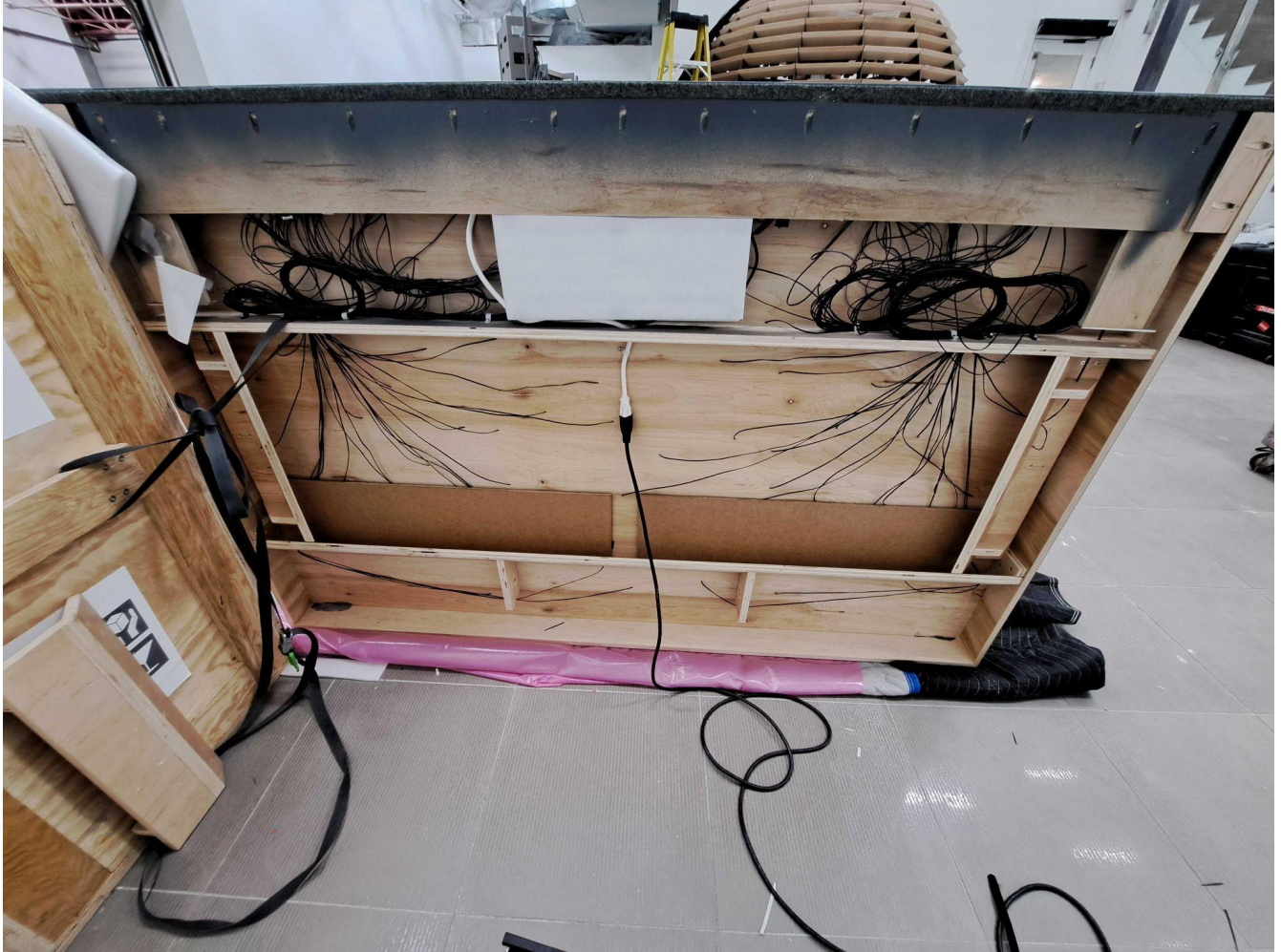
Fig. 1: French Cleat

Fig. 2: Drawer

Fig. 3: Back of Piece

DETAILED TECHNICAL INFORMATION

Normal Software Operation

When the artwork powers on, the modules enter a startup period lasting a maximum of 30 seconds where they attempt to connect to the network router's WiFi signal. During this period, the screens will be inanimate, but a red LED on the rear of the module will be lit. Usually, the modules will only take around 10 seconds to connect to the network before proceeding to the next step. If the startup period lasts the full 30 seconds, the modules could not detect a signal (see: _Preliminary Troubleshooting Steps_).

At the end of the startup period, regardless of whether a module is connected to the network, the displays will flash a black screen three times before displaying the word, "Anfang" - German for "beginning." Each module will then proceed to cycle through a repository of passwords, refreshing every four seconds. With every refresh, the remnants of the previous word can be seen in the background. Due to the nature of the devices, the timing of the refresh may differ slightly between one module to another.

Every 40 seconds, all the displays will show the same word, flash twice, clear the screen, then display a new, unique word. The process then repeats from the start.
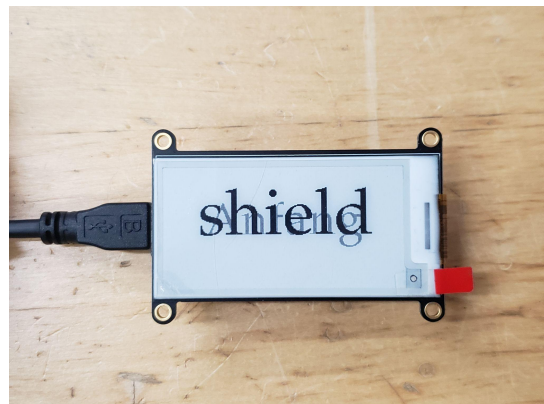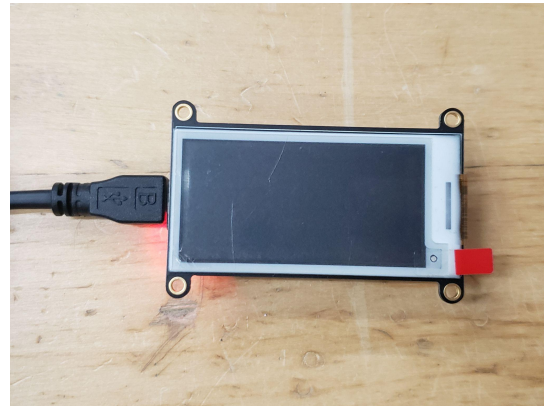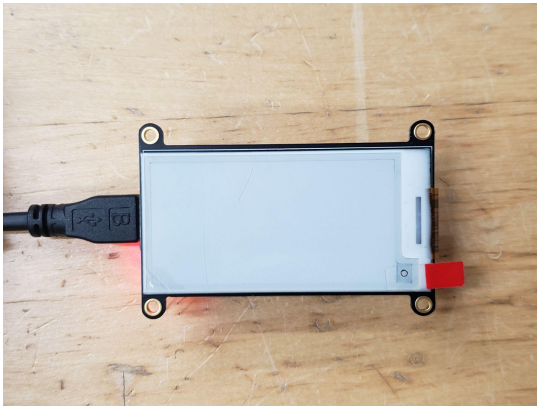
Preliminary Troubleshooting Steps

After turning on the power switch, nothing seems to happen.

Does a red LED light up on the rear side of the modules? If not, turn off the power switch immediately, unplug the power cord from the power source and double check the wiring to match the wiring diagram: ensuring to not flip the polarity of the modules leads. Once this verification is done, plug back the power cord, flick On the switch and see if power cycles to the displays.

The display shows "Anfang," but doesn't change to another word.

The SD card inside the module or the file it contains is corrupted. Pull out the SD card and try to open the file inside named *passwords.txt*. If you can see the SD card on your computer, but cannot open the file, retrieve the same file from another module's SD card and replace the file on the original. If you can't see the SD card at all, reformat the SD card and then attempt the previous step. If the SD card can't be formatted, replace it with a new one. The SD cards need to be formatted in FAT16. While formatting with an OSX computer, make sure that you've kept the SD card's partition map scheme as Master Boot Record, not GUID or Apple Partition Map.

Every 40 seconds, the displays show "FAILED!" in synchronisation.

The SD card on the main module (see: _Glossary of Components_) cannot be read. Remove, then re-insert the SD card. The module should automatically read the card, if possible. If the problem persists, attempt the steps from the previous troubleshooting scenario . Be careful not to replace any other files on the main module's SD card.

The displays never show the same word in synchronisation.

There is an issue with the modules connecting the network router's WiFi network. Unplug power to everything, wait 5 minutes, plug back the power cord to the router, wait 10 minutes and then plug back the rest of the components to the power source. If the problem persists, contact the studio.

Some/all modules are not turning on.

      Open the drawer so you have access to all power connections. Turn the power Off to all displays.

      Test one module by connecting its leads to the green terminal blocks. With a small screwdriver, press into the orange pin to release the spring of a terminal. Insert the lead, then release the pin to lock the lead into place.

      Note: Ensure that the positive leads (grey-dashed wires) match the positive terminals and the negative leads (black wires) match the negative terminals.

      Turn the power switch ON. If a red LED on the rear of the module turns on, the module is successfully connected. If not, turn the power OFF immediately and double check the wiring polarity before proceeding.

      Connect the rest of the modules' wires to the terminal blocks. Always double check that the leads match the correct terminals before connecting.

      Connect the appropriate jumper wires between each corresponding terminal block. The green wires connect the positive terminal blocks and the black wires connect the negative terminal blocks.

      Once the verification is done, close the drawer while preventing pinching any cable in the process.

Troubleshooting Assistance

Prior to contacting the Antimodular Studio with a problem about your artwork, please ensure that you went through the preliminary troubleshooting steps outlined in the previous section.

The troubleshooting process will vary depending on the problem. In order to make the process easier, it is recommended that you collect and send the following information to the studio:

- Date and time when the problem first happened;
- Description of the problem;
- Actions taken so far and conclusions;
- Detailed photographs (or videos) displaying the problem;
- Detailed photographs (or videos) of the suspected faulty component;
- Detailed photographs (or videos) of the whole artwork and its surroundings;
- Personnel involved.

Support (Contact Us)

If you would like support for the piece, please feel free to call Lozano-Hemmer's studio in Canada:

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Montréal, Québec, Canada
H2J 2L1
Tel 1-514-597-0917
info@antimodular.com
www.antimodular.com

APPENDIX I - INSTALLATION

Glossary of Components

Component	Description
Frame	A wooden frame, hosting all modules. The frame holds a drawer that hosts power supplies and the terminal blocks.
Module	An assembled combination of an e-paper display, an ESP32 microcontroller and an SD card.
Main module	A specific module that sends messages to the others via WiFi. Its SD card contains files not included in the others, namely *main.txt* and *settings.txt*.
Electronic-paper display	The display is attached to a microcontroller. Electricity is only needed to change the image which retains when off.
ESP32 microcontroller	The processor board responsible for running code and connecting to WiFi. The version used is the Adafruit Feather Huzzah32.
SD card	A microSD card found in every module. Inserts into a slot on the rear of the display. Contains a file called "passwords.txt," which is the same file on all of them.
Wire leads	A combination of two wires that connect the modules to the terminal blocks. The positive lead has a grey dashed line while the negative lead is all-black.
Terminal block	A plastic block containing a set of 12 terminals where the modules' wires are connected. Each block is labelled "positive" or 'negative" on its side.
Jumper wire	Connects different terminal blocks together. Positive jumper is green, negative jumper is black.
Power supply unit	Two units as half of the modules are powered by their own power supply. Connect to the green terminal blocks.
DIN rail	Holds the terminal blocks in place. Located in the drawer.
Power switches	Located in the drawer: each switch powers on half of the modules.

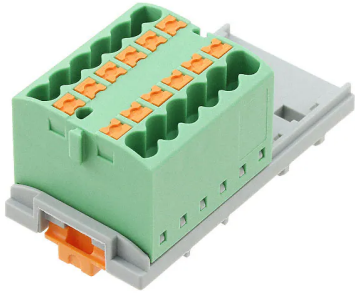## Images of components, for consultation:
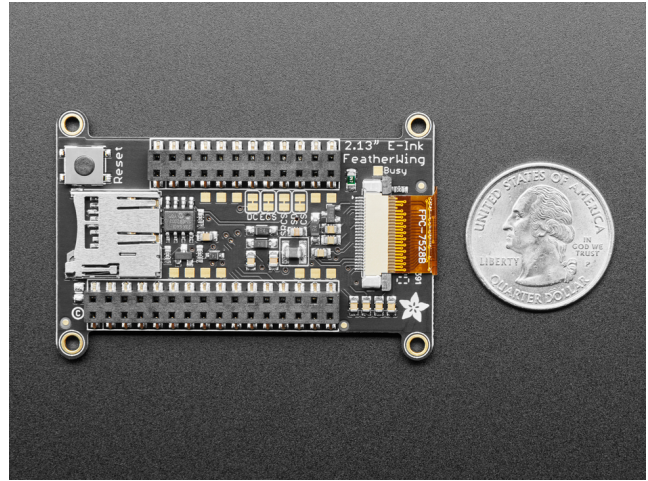
Electronic-paper display
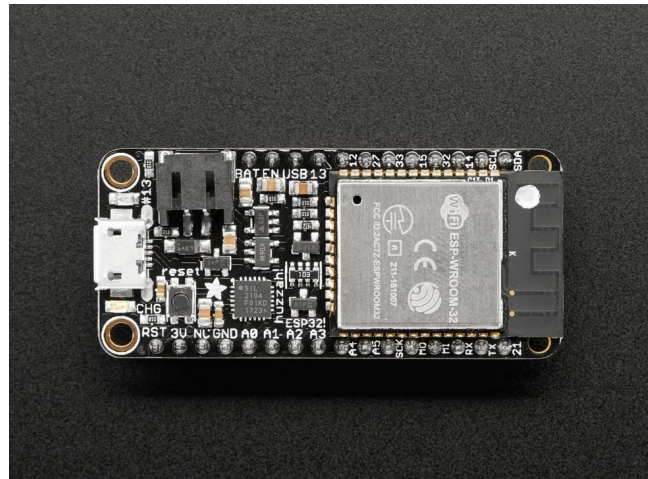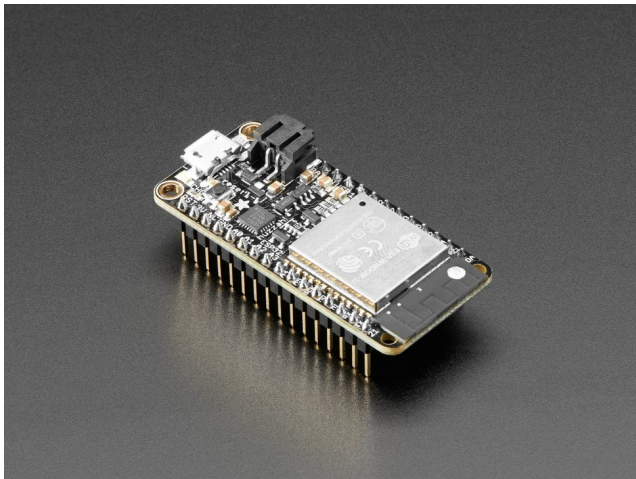
ESP32 microcontroller (Feather Huzzah32)

Note: There are either 12 or 16 pins on the two lengthwise edges of the microcontroller and a matching number of holes on the rear of the display. Match these numbers when attaching the two components.
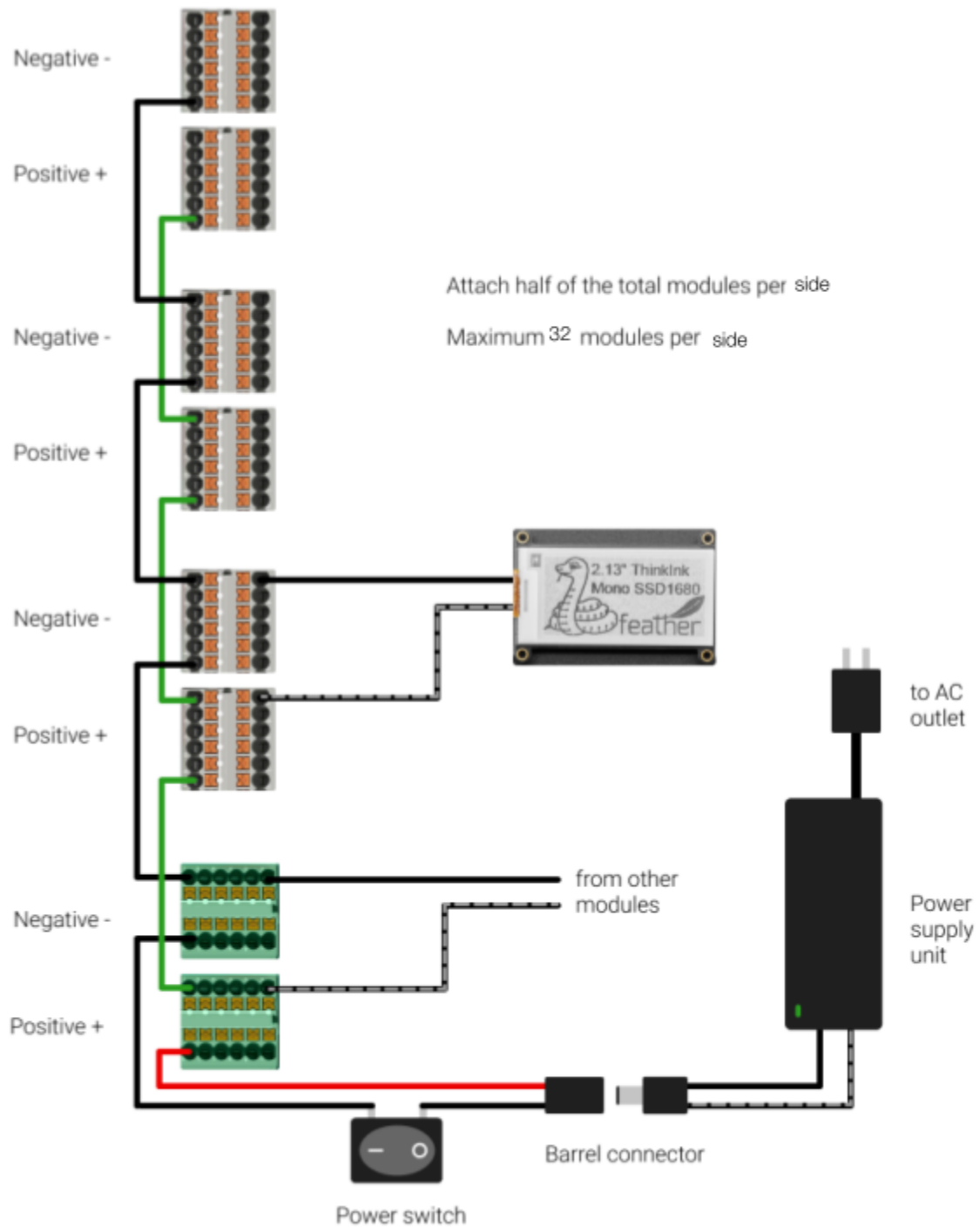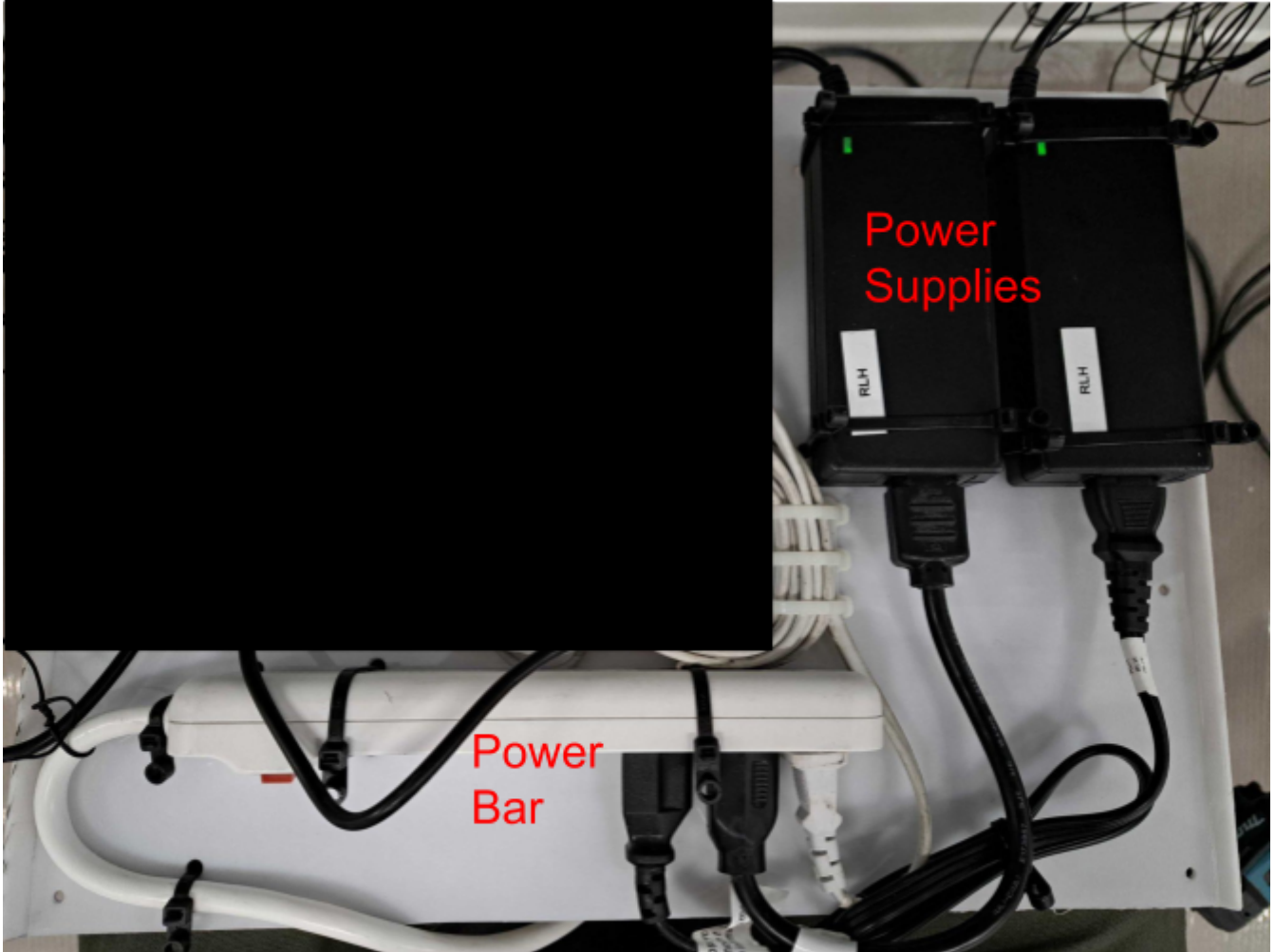
Terminal block (main)

Terminal block

Power supply unit

Wiring Diagrams

In order for the piece to run properly, the modules should be connected according to the following diagram.

Negative -

Positive +

Attach half of the total modules per side

Negative -

Maximum 32 modules per side

Positive +

Negative -

Positive +

Negative -

Positive +

from other modules

to AC outlet

Power supply unit

Barrel connector

Power switch

View of the interior drawer of the piece

APPENDIX II - TECHNICAL DATA SHEETS

Wood frame

Number of modules	Hosting 64 modules
Height	1.25m
Width	1.5m

Power supply unit

Input rating	110-240v AC
Output	5vDC 10A max.

Terminal Block

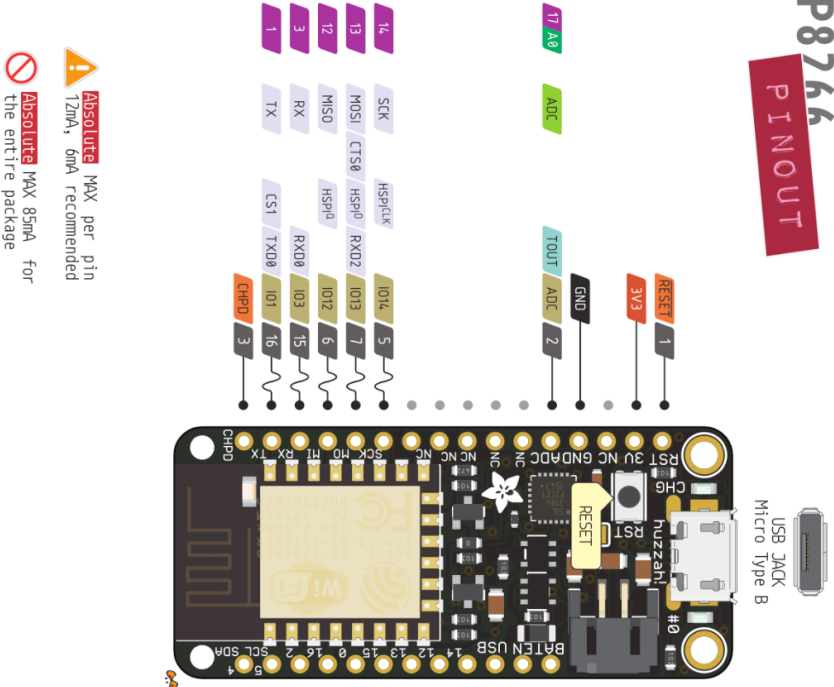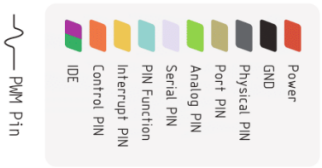| Number of Positions	12
Current Rating	32A
Voltage Rating	630V
Dimensions	28.6mm Length, 36.9 mm Width, 21,7 mm Height

Electronic-paper display

Model	Adafruit 2.13" Monochrome eInk / ePaper Display FeatherWing with SSD1680
Resolution	250x122
Height	61.3mm
Width	40.2mm

Huzza Feather ESP8266

feather
HUZZAH ESP8266
PINOUT

adafruit

PWM Pin

Power
GND
Physical PIN
Port PIN
Analog PIN
Serial PIN
PIN Function
Interrupt PIN
Control PIN
IDE
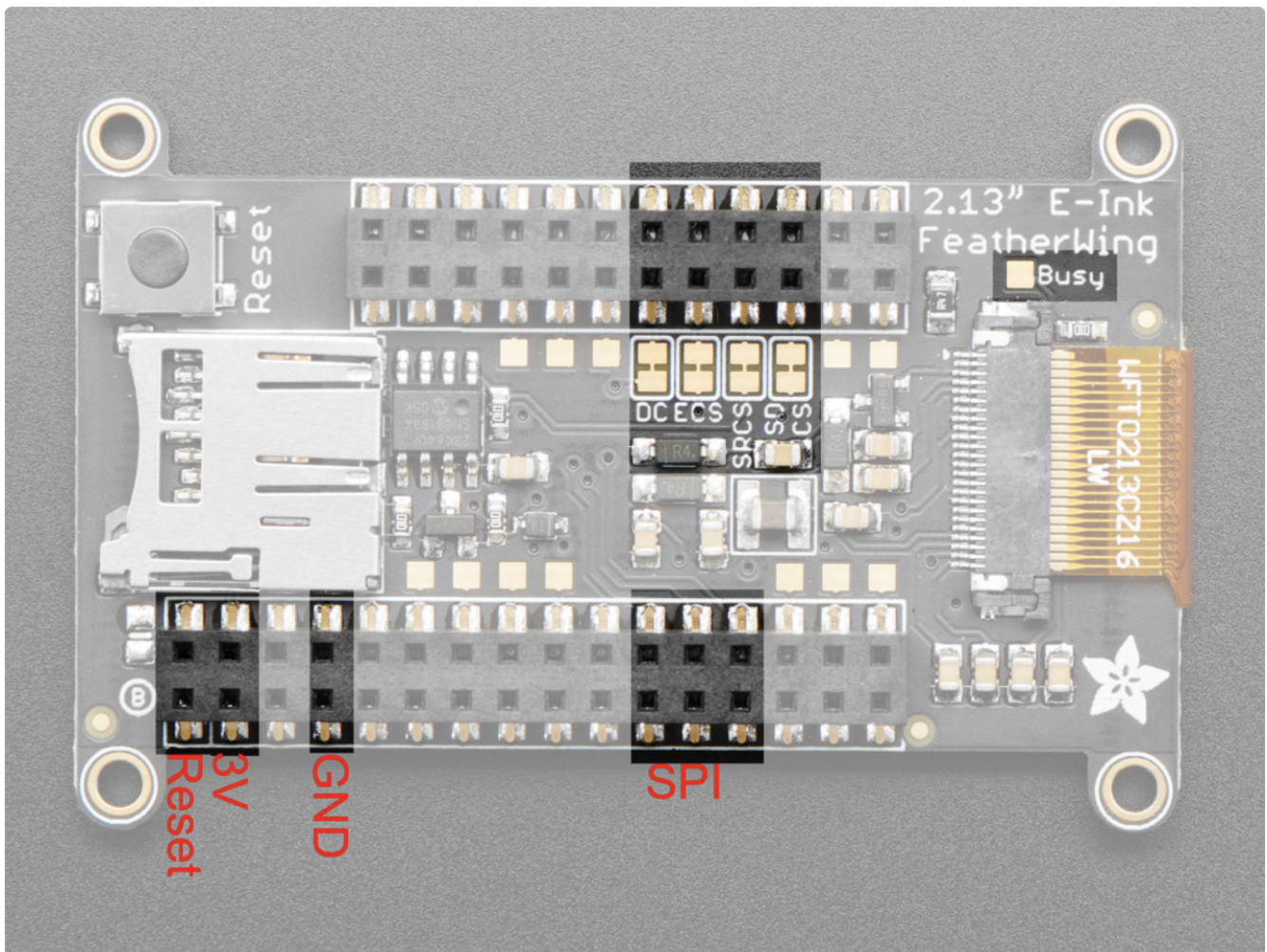
Absolute MAX per pin 12mA, 6mA recommended

Absolute MAX 85mA for the entire package

https://www.adafruit.com/product/2821

USB JACK
Micro Type B
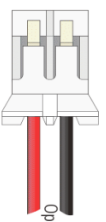
Connect to ground to disable the 3.3V regulator

Optional Lipoly Battery

VBUS Connected to 5V USB Port Absolute MAX 500mA

VBAT It's the positive voltage from to JST Batt Jack

3V3 3V3 output from regulator Absolute MAX 400mA

04 SEP 2017
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APPENDIX III - PACKING

The French cleat and other hardware for mounting the piece should be stored securely underneath so that nothing is on top where the screens are and nothing is sliding around. The paint on the face of the piece is easily scratched so the top should be securely wrapped in plastic.

Also ensure that no pressure is placed on the lcd screens as this can cause damage.