

ACC:Xess Printer Monitor

Wemos D1 mini (ESP8266) + SH1106 OLED Klipper/Moonraker Display

A compact, feature-rich external monitor for Klipper / Moonraker printers.

Displays temperatures, status, progress, ETA, layer information, fan speeds, and more — all on a 1.3" SH1106 OLED driven by a Wemos D1 mini (ESP8266).

This project includes a custom 3D-printed enclosure designed to house the Wemos D1 and the OLED-display. The enclosure is available in two variants: one slightly over-engineered (Type A), and one streamlined version without unnecessary features (Type B).

Quickstart

Download the firmware and open it in Arduino IDE

Install the ESP8266 board package

Install required libraries: ArduinoJson, Adafruit GFX, Adafruit SH110X

Edit WiFi credentials + Moonraker IP in the .ino file

Wire the OLED: SDA → D2, SCL → D1

Select board: LOLIN(WEMOS) D1 R2 & mini

Upload the firmware

Power the monitor — it will connect automatically and begin displaying data

Printer Compatibility

(Including Creality K1 Requirements)

The ACC:Xess Printer Monitor was originally developed for the Creality K1 series (see important notes regarding K1 compatibility), but it works seamlessly with any 3D printer running Klipper together with Moonraker.

Creality K1 / K1 Max

Any DIY Klipper machine

Any printer exposing standard Moonraker API endpoints

Important for Creality K1 / K1 Max users

Creality K1 printers do not include Moonraker by default.

To use this monitor with a K1 or K1 Max, the printer must be:

Rooted (root access enabled)

Running Moonraker

Once Moonraker is installed, the K1 behaves like any standard Klipper printer, and the monitor works out-of-the-box.

After Moonraker is installed:

The monitor connects directly to the printer's Moonraker API

All features (status, ETA, layers, fans, etc.) work normally

🔌 Wiring (Connections)

The ACC:Xess Printer Monitor uses a Wemos D1 mini (ESP8266) and a 1.3" SH1106 OLED display. The display communicates over I2C, requiring only four wires.

Notes

The SH1106 OLED must be powered from 3.3V, not 5V

Typical I2C address: 0x3C

No resistors or level shifters required

Keep I2C wires short for best stability

Wiring diagram

Wemos D1 mini	SH1106 OLED
3V3	VCC
GND	GND
D1	SCL
D2	SDA

★ Features

Real-time printer status (Ready, Idle, Preparing, Printing, Paused, Cooling, Finished)

Smooth progress bar with Fluidt-style smoothing

Accurate ETA even without slicer metadata

Temperature graph (hotend + bed)

Fan speed overview

File information with scrolling long filenames

Automatic page rotation

Filament runout alert mode

📦 Required Libraries

Install via Arduino IDE → Tools → Manage Libraries:

ArduinoJson (6.x)

Adafruit GFX Library

Adafruit SH110X

Included automatically with the ESP8266 package:

ESP8266WiFi

ESP8266HTTPClient

Wire (I2C)

Install ESP8266 Board Package

Open Arduino IDE

Go to File → Preferences

Add this URL under Additional Boards Manager URLs:
http://arduino.esp8266.com/stable/package_esp8266com_index.json

Tools → Board → Boards Manager

Search for ESP8266

Install esp8266 by ESP8266 Community

Configure WiFi and Moonraker IP

Edit these lines in the .ino file:

```
const char* ssid      = "YourWiFiName";  
const char* password = "YourWiFiPassword";  
const String moonrakerHost = "http://192.168.x.x:7125";
```

Notes

ESP8266 supports 2.4 GHz WiFi only

Moonraker typically runs on port 7125

Uploading to Wemos D1 mini

Tools → Board → LOLIN(WEMOS) D1 R2 & mini

Tools → Port → select the Wemos/CH340 device

Recommended settings:

Flash Size: 4MB (FS:none)

CPU Frequency: 80 MHz

Upload Speed: 921600 or 115200

Upload using Sketch → Upload or Ctrl + U

First Startup

On boot, the monitor will:

Show boot animation

Connect to WiFi

Display its own IP address

Connect to Moonraker

Begin monitoring

Display Pages

Temperatures

Status + progress bar

Time (elapsed + ETA)

Temperature graph

Fan speeds

File information (filename, object height, total layers)

Filament Runout alert

Status Modes

State	Meaning
Ready	Printer idle and cold
Idle	Heating or moving
Preparing	File loaded
Printing	Active print
Paused	Print paused
Cooling	Print finished / cooling nozzle
Finished	Print complete and nozzle cooled

Troubleshooting

Uploading issues

Ensure the USB cable supports data transfer

Avoid USB hubs during flashing

Hold the BOOT button (if available) when connecting

Verify the correct serial port is selected

WiFi issues

Check SSID/password

Ensure 2.4 GHz WiFi

Moonraker issues

Verify the printer's IP

Ensure Moonraker is running

Test in a browser:

`http://<printer-ip>:7125/printer/info`

OLED issues

Check wiring

Confirm the display is SH1106, not SSD1306

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Credits

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