Wiring and Installation

This section explains how to connect the SLWF-09 controller, add-on modules, and LED strips safely and correctly.
Follow all instructions carefully to ensure reliable operation and to avoid damage to the controller or connected equipment.

3.1 Safety Precautions

- **Disconnect power** before attaching or removing any cables or add-on modules.
- Verify that your **LED strip voltage matches the power supply voltage** (5V, 12V).
- **Never connect different voltage levels** (e.g., 12 V LED strip with 5 V power supply).
- When using **PoE**, ensure your network switch or injector supports **IEEE 802.3af**. **Please limit the current for the LED strip to 800mA**
- Observe correct polarity when wiring power and LED connections.

3.2 Powering the SLWF-09

You can power the SLWF-09 in **three different ways**:

1. **USB-C port** – 5V or 12V
   - Ideal for testing, firmware updates, or low-power LED setups.
   - Supports USB PD for negotiation, can supply 5V or 12V.
2. **DC plug-in** – 5V to 12V DC
   - Connect a DC plug into DC plug-in connector.
   - DC "+" goes to LED strips through the onboard MOSFET (relay) switch or to VCC directly bypassing MOSFET (relay).
3. **Wire fast-connect terminal** – 5V to 12V DC
   - Connect a wire directly to the VIN (+) and GND (–) terminals.
   - VIN also powers the LED strips through the onboard MOSFET switch.
4. **PoE Module (optional)** – IEEE 802.3af
   - Provides **5V 800mA** from an Ethernet connection via a PoE-enabled switch or injector.
   - Can be used together with the Ethernet add-on for single-cable operation.

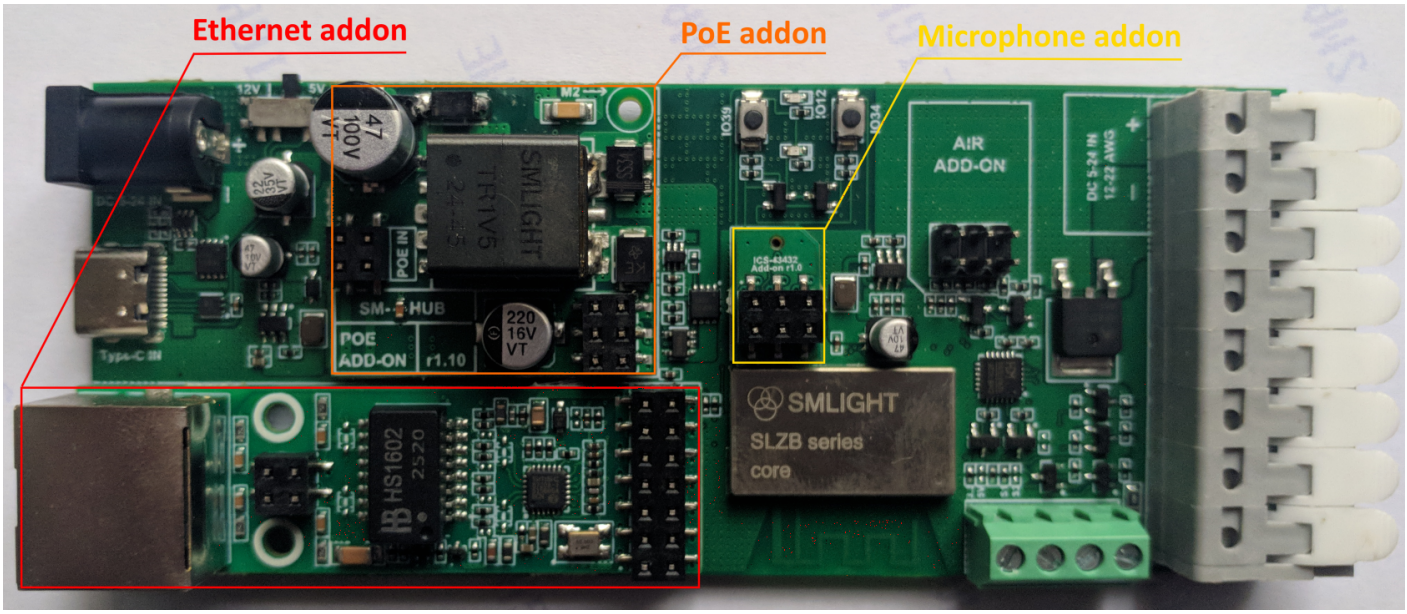
3.3 Connecting LED Strips

The SLWF-09 supports most addressable LED protocols, including **WS2812B, SK6812, APA102**, and others.

Steps:

1. Identify your LED strip's **Data** (and optional **Clock**) lines, **V+**, and **GND**.
2. Connect **LED OUT 1** or **LED OUT 2** on the SLWF-09 to the corresponding LED strip input:
   - **Data** → DATA pin
   - **Clock** → CLOCK pin (only for clocked LED types such as APA102)
   - **V+** → LED supply voltage (must match power source)
   - **GND** → Common ground between SLWF-09 and LED strip
3. If controlling long LED runs, use an **external power injection** every several tens of meters to avoid voltage drop.

3.4 Installing Add-on Modules





3.4.1 Ethernet Module

1. Align the module with the **Ethernet header** on the main board.
2. Insert firmly, ensuring the keyed connector matches the socket.
3. Connect your network cable to the **RJ45 port**.

3.4.2 PoE Module

1. Install the PoE module between the **Ethernet add-on** and network cable.
2. Connect the network cable from a **PoE switch/injector** to the module.
3. The module will automatically power the SLWF-09.

3.4.3 Microphone Module

1. Align the module with the **MIC header** on the main board.
2. Insert carefully; the keyed connector ensures correct orientation.
3. Enable sound-reactive mode in **WLED settings**.

3.5 First Power-On

1. Double-check all wiring connections.
2. Apply power via your chosen method.
3. Observe the status LEDs:
   - **Power LED** – solid on when powered
   - **Status LED** – WLED activity indicator

4. Connect to the SLWF-09 via Wi-Fi or Ethernet to complete setup.

3.6 Recommended Installation Tips

- Mount the SLWF-09 in a **ventilated place** to protect from dust and accidental contact.
- For permanent installations, **secure cables with strain relief**.
- Keep **data wires short** to reduce signal degradation.
- Use **twisted pair or shielded cable** for long data runs.

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