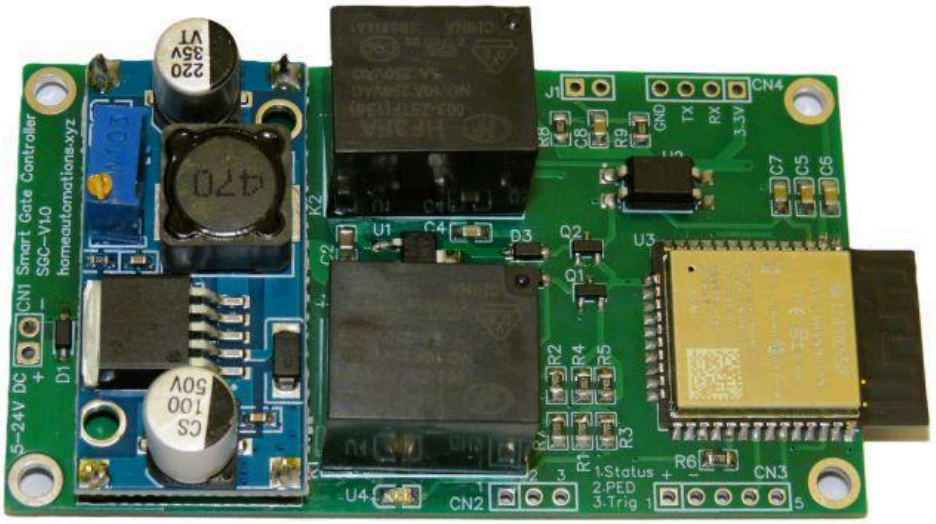
# Smart Gate Controller

(V1.3)




---


**Introduction** **1**
**Getting Started** **2**
**Initial Setup** **3**
Hardware Connections 3
Power Supply Connections: 3
Connecting the unit to WiFi 5
Troubleshooting 6
Installing ESPHome on Home Assistant: 6
Adding your Smart Gate Controller for custom uploads 7
Key Settings to Update 10
**Additional Capabilities** **13**
Bluetooth 13
Additional GPIO Connections 13
Programming the device 14
**Integrating device into Home Assistant** **14**
Disclaimer: 15
**References** **15**
**Support** **16**

# Introduction

Welcome to the Smart Gate Controller user manual. The Smart Gate Controller utilises ESPHome for seamless integration with Home Assistant. This flexible setup allows users to tailor the configuration to their specific requirements. For instance, users can employ ESPHome API or MQTT to establish integration with Home Assistant.

There are two versions of the Smart Gate Controller with the only difference being that one has an onboard Wi-Fi antenna, and the other an external antenna that allows for a connection to Wi-Fi that is further away from the Gate Motor. Both models use the dual-relay design for gate trigger and pedestrian operation. Holiday Lockout models are covered in a separate manual.

**Important Note:**
*Please exercise caution when performing updates on the GateController. Incorrect updates may disrupt the Over-The-Air (OTA) functionality. While this does not permanently damage the unit, rectifying faulty updates will require the use of an FTDI adapter.*

*This module is compatible with 5-30V DC Supply. It can be used with the Centurion D5, D5-EVO Smart+ and D6 Smart Motors, or most motors with a 24V DC Supply. Verify the gate motor AUX output voltage and available current before installation; compatibility depends on the motor terminal configuration.*

# Getting Started

Your Gate Controller comes pre-installed with a basic configuration, which allows you to connect to your Wi-Fi network using a Captive Portal. While it’s possible to use the device for direct integration with Home Assistant at this stage, we recommend updating it with custom settings to better suit your configuration, as well as for added security.

# Initial Setup

## Hardware Connections

Before powering up the unit (or connecting the Power), ensure that all necessary hardware connections have been made. Also make sure the unit is isolated from touching any components within the Centurion Gate motor enclosure.
*(Connect these first)*

- **Pin 1: Status - WHITE** -
    - Connect to “Status” on D5
    - IO4 on the D6/Smart *(Confirm if your settings are default)*
- **Pin 2: Ped - BLUE** -
    - Connect to “Ped” on D5
    - IO2 on the D6/Smart (*Optional*, *Confirm if your settings are default*)
- **Pin 3: Trig - YELLOW** -
    - Connect to “Trg” on D5. This can be connected together with a traditional remote receiver on the legacy D5.
    - For the D6/Smart motors, connect to IO6 ( It **HAS** to be mapped to a new IO, or IO6 in this instance, on the Smart Motors using the centurion App)

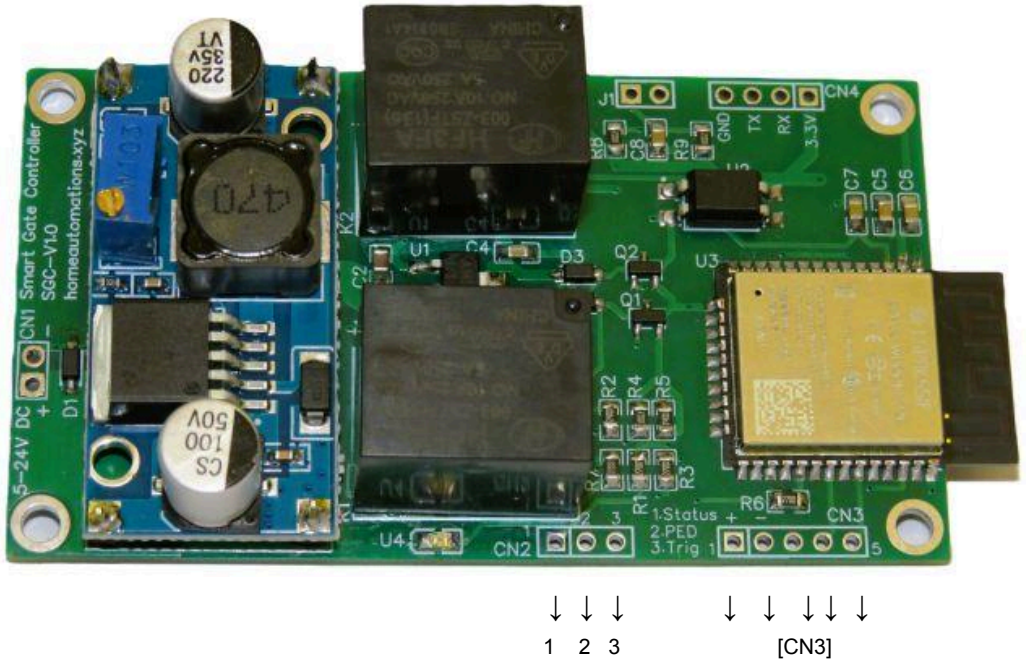
**IMPORTANT:** *On D5 Smart and D6 Smart motors, the I/O terminal functions are configurable. Before connecting the Smart Gate Controller, verify the terminal assignments in the Centurion app. Configure the selected trigger terminal appropriately and confirm the status and pedestrian terminal assignments. Never assume that the terminal configuration matches the factory defaults.*

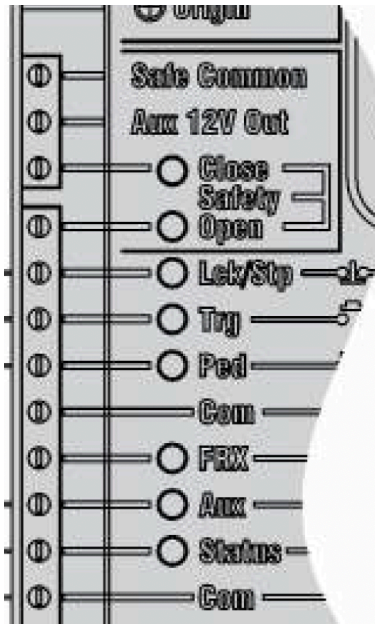
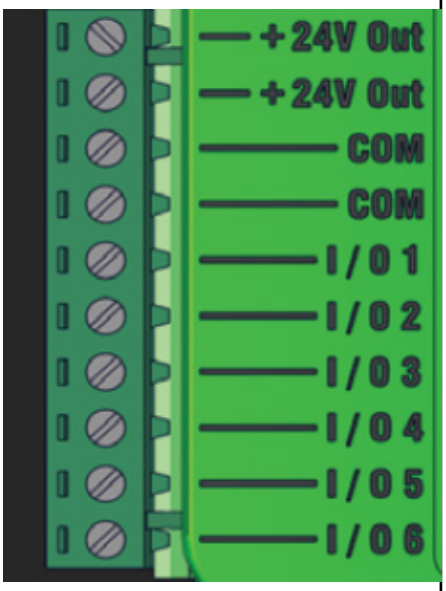
## Power Supply Connections:

*(Connect these last, and make 100% sure these connections are correct!)*

- **GND - BLACK**:
    - Connected to “COM” on D5/D6/Smart
- **12V/24V - RED**:
    - Connected to “AUX 12/24V OUT” on D5/D6/Smart

***Note****: Do not connect the controller directly to the gate motor battery. Always use the designated AUX power output and COM terminals, as illustrated. The controller relies on a common ground reference for correct operation. Incorrect wiring may damage the controller or gate motor electronics.*




| | D5 EvoController Connections | | D5 Smart / D6 |
|---|---|---|---|
| Black →<br>Red → |  | Red →<br>Black →<br>Blue →<br>White →<br>Yellow → |  |
| Yellow →<br>Blue →<br><br>White → | | | |

**D5 Smart / D6 Smart Controller Connections**

The **D5-Evo SMART** Control Card's Input / Output terminals are defaulted with the following configuration;

| Control Card Terminal | Default Setting | Control Card Terminal | Default Setting |
|---|---|---|---|
| I1 | Trigger (TRG) | I/O4 | Gate Status |
| I2 | Pedestrian (PED) | I/O5 | Unassigned |
| I3 | Infrared Beam Close (IRBC) | O6 | Unassigned |

The **Dx SMART (24V)** Control Card's Input / Output terminals are defaulted with the following configuration;

| Control Card Terminal | Default Setting | Control Card Terminal | Default Setting |
|---|---|---|---|
| I/O1 | Trigger (TRG) | I/O4 | Gate Status |
| I/O2 | Pedestrian (PED) | I/O5 | Unassigned |
| I/O3 | Infrared Beam Close (IRBC) | I/O6 | Unassigned |

Once the unit is properly connected and powered up, proceed to the next step: connecting the unit to your Wi-Fi network.

**Note:** *For the D6 / Smart Motors, please ensure that the mapping is the same using the application. It is possible for the IO Pin mapping to be different! This WILL damage the unit if they are incorrectly connected! Verify the wiring before applying power.*

## Connecting the unit to WiFi

1. Using a laptop or smartphone, search for the WiFi Access point “GateController”.
2. Enter Password: ‘password’
3. Once connected, using a browser navigate to 192.168.4.1 or “http://smart-gate-controller.local”
4. This will lead you to a configuration page where you can select the SSID of your Wi-Fi Access Point, as well as enter your WiFi Password. Once configured, the device will connect to your Wi-Fi network and be assigned an IP Address.
5. To verify the successful connection, you can access the newly assigned IP address (typically found on the router’s DHCP page) using a laptop or smartphone connected to the same Wi-Fi network. Alternatively you should be able to access the device by visiting “http://smart-gate-controller.local”.

**SECURITY NOTICE:** The default credentials are provided for initial configuration only. Since this device controls physical access to your property, you should replace the default firmware configuration with your own secure credentials before regular use.

### *Troubleshooting*

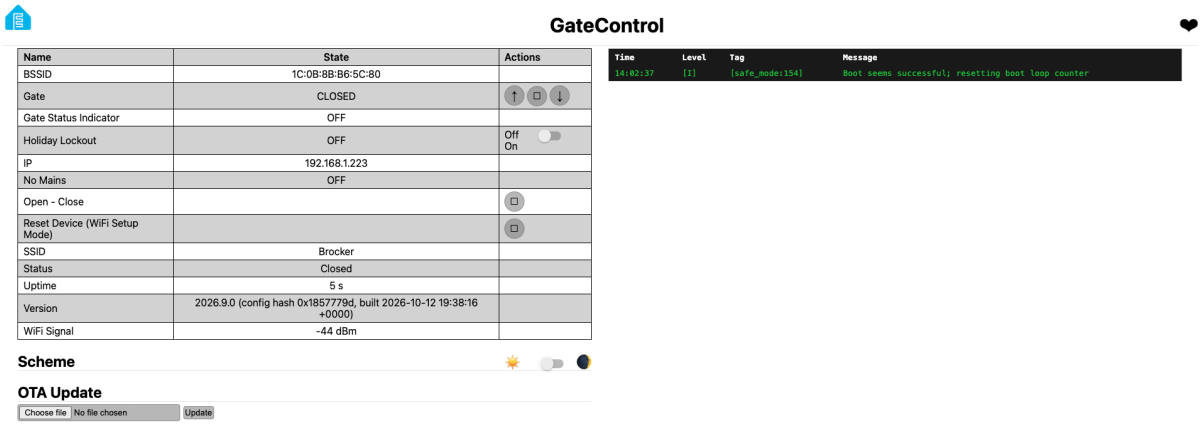
*In the rare event that the configuration is incorrect, and the device cannot connect to the configured Access Point, it will automatically advertise the “GateController” access point after 1-2 minutes.*

*It may take ~2 minutes for the unit to advertise the Wi-Fi AP the first time! This is due to the fact that all units get tested before being sent out, and they will attempt to connect to the testing AP first!*

By navigating to the newly assigned IP Address “http://new_ip_address” or “http://smart-gate-controller.local”, you will be presented with the following screen:

You may be prompted to enter a username and password:

- Username: admin
- Password: secretpassword



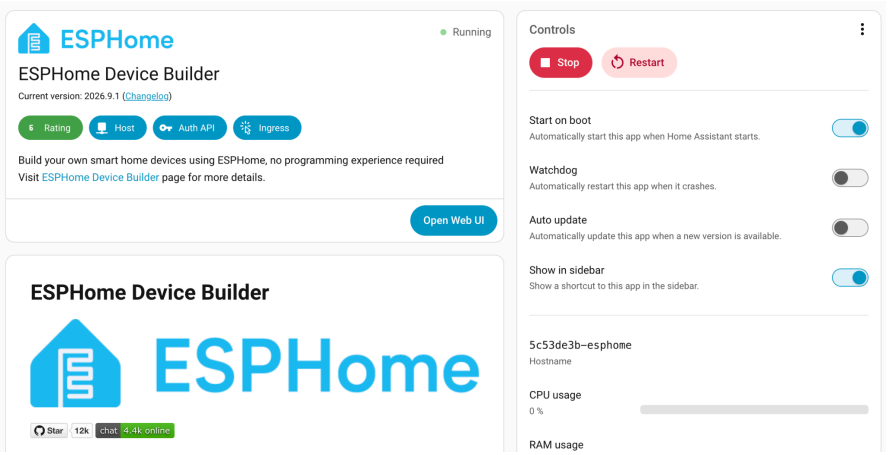

This screen will be used to upload the new custom firmware, facilitating the connection to ESPHome in later steps.

## Installing ESPHome on Home Assistant:

*(If ESPHome has been installed already, this step can be skipped)*

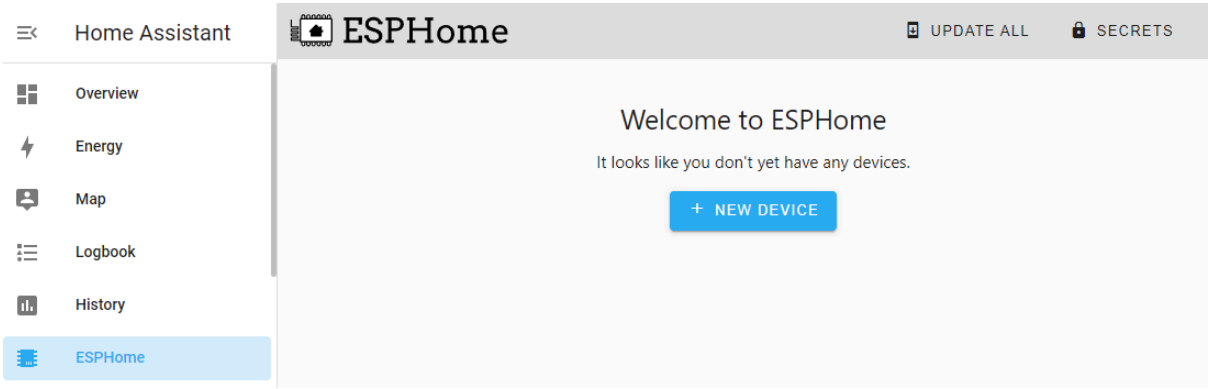
On Home Assistant, navigate to Settings | Add-Ons.
From the Add-On Store, select ESPHome and click install to install it.

Once installed, be sure to start the ESPHome addon and select the “Show in sidebar” to get the ESPHome icon on the left in the sidebar:

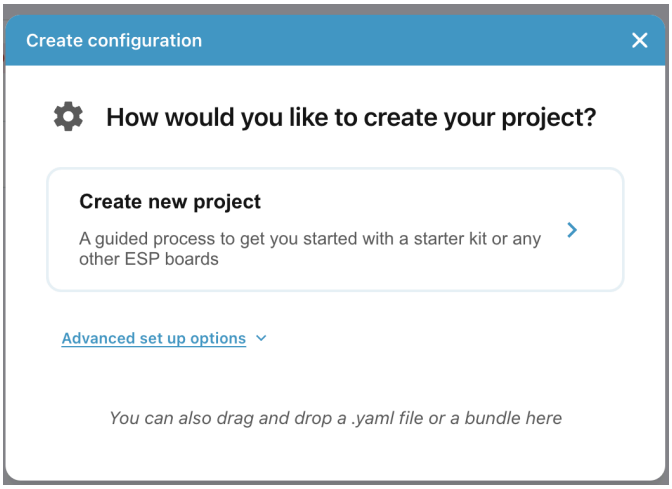



# Adding your Smart Gate Controller for custom uploads

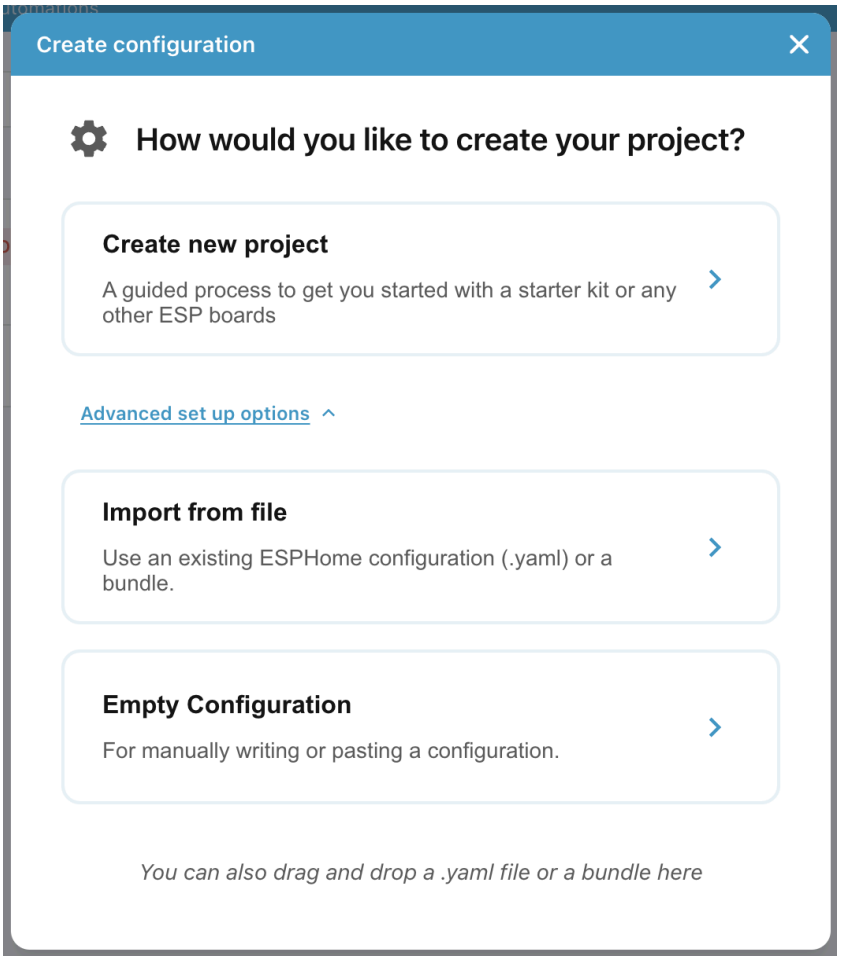
ESPHome can be accessed by clicking on the  “ESPHome” icon in the left sidebar.

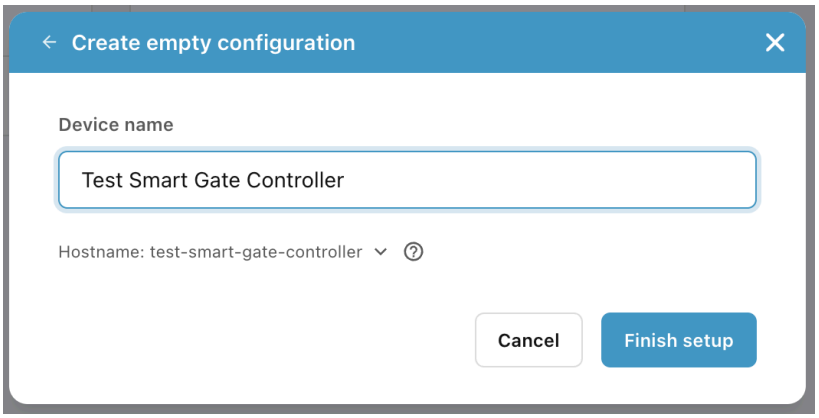



When navigating to ESPHome in Home Assistant, click the “+Create Device” button (at the bottom right if there are existing devices) to add a new device.

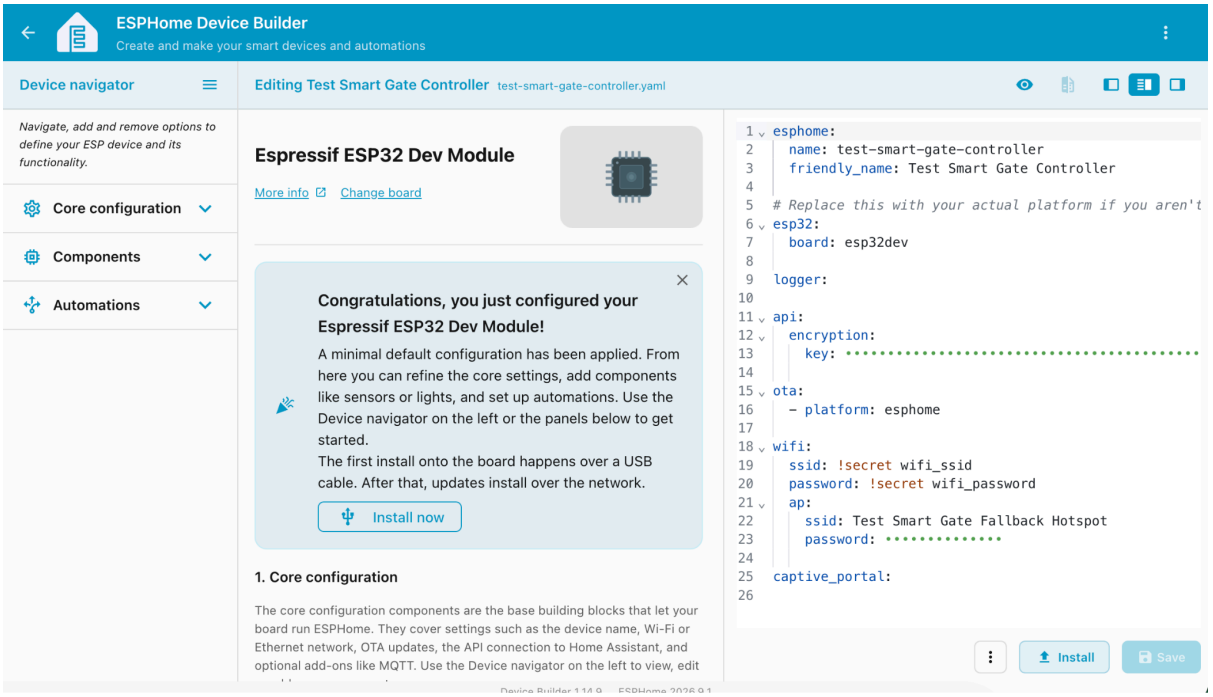


The easiest way is to select “Advanced set up options” and then “Empty Configuration” and then give it a name.




Click “Finish Setup” and you will be taken to the YAML configuration editor:




The only thing you need to keep here is the ‘api’ and ‘key’ section. (If you deleted it, that’s fine, but you need to have an encryption key for security).

In the next step you will be configuring the code for your respective device as well as the environment (Wifi AP, IP Address, etc). We will then install the new Firmware on the device from ESPHome, ensuring that ESPHome can manage the device.

You can copy the latest version of the code from:
https://github.com/HomeAutomationsXYZ/SmartGateController/blob/main/Configs.yaml

Please be sure to update all the required [VARIABLES] in the file with your own configuration. Some variables, like the Wi-Fi Credentials will be saved in the SECRETs file, which can be accessed by clicking on the top right of the ESPHome main screen. This is an easy and secure way to store certain credentials that will be re-used for various devices.

# Key Settings to Update

To fully customise your Gate Controller experience, consider updating the following settings:

1. **Access Point SSID and Password:** Enter the correct Wi-Fi network name (SSID) and password. (Please note this is case sensitive)
2. **Static IP Address**: This is optional but recommended  if you want your devices to keep the same IP Address. A static IP address can be configured in ESPHome or reserved through your router.
3. **API Encryption Key:** Ensure to have a strong API Encryption key.
4. **Removing the Captive Portal**: Given that this device controls access to your property via your gate, having the Captive Portal capability can pose a security risk. In the event of a Wi-Fi connection loss, it will “advertise” its own access point, potentially allowing unauthorised users to connect. An alternative is to add at least a strong WebServer password (https://esphome.io/components/web_server.html) that will prevent users from triggering the gate.
5. **Custom Names**: Personalise your setup with custom names that align with your preference or naming scheme.
6. **MQTT and/or HA API**: Enable MQTT or update the Home Assistant API keys to align the device with your specific configuration needs.
7. **OTA Password:** For ease of setup, there is no OTA Password configured. Please add an OTA Password to ensure that only you can perform updates “Over-The-Air”. For later releases this may not be required since it will use the API Encryption Key.
8. **Additional Sensors:** If you have additional sensors connected to CN3, you may need to include their configuration.

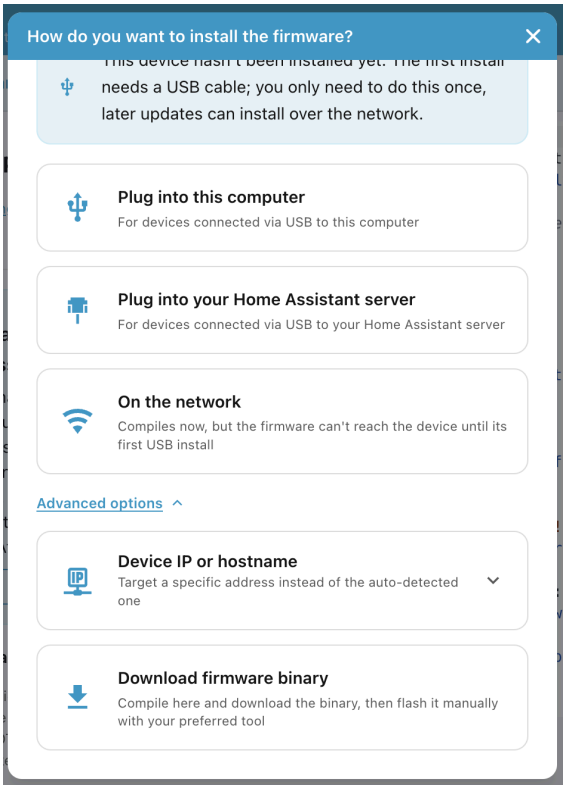
This code can be replaced by copying and pasting the provided code from GitHub. Please make sure that you configure at least:

- Wi-Fi SSID
- Wi-Fi Password
- MQTT Section (If required)
- OTA Password (For more secure OTA capability)
- API Encryption Key (For added security)

(For now, it may be a good idea to keep the Captive Portal, in case some of the Wifi Configuration turns out to be incorrect). For additional security you should add at least Web Server authentication.

Once all the configuration is done, click “INSTALL” from the top right and a new window will open:

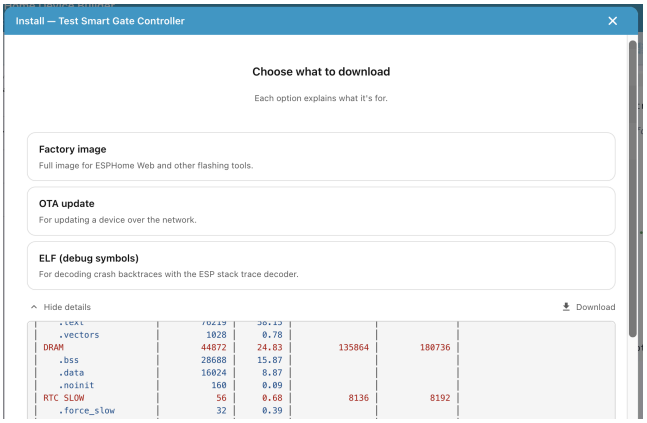
Click “Advanced Options”  and then “Download firmware binary” to download the firmware file to your computer.




ESPHome will compile the firmware and report any configuration or build errors. (Depending on your Home Assistant server speed, this may take a while to download libraries and compile and build the firmware. It can take ~5 - 15 minutes. Please correct any errors that may be shown here).

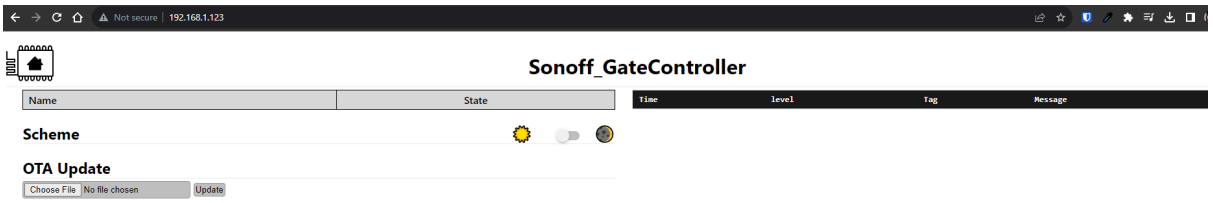
Once it’s compiled, you can click the “Download” link to save the firmware to your computer.

If prompted:

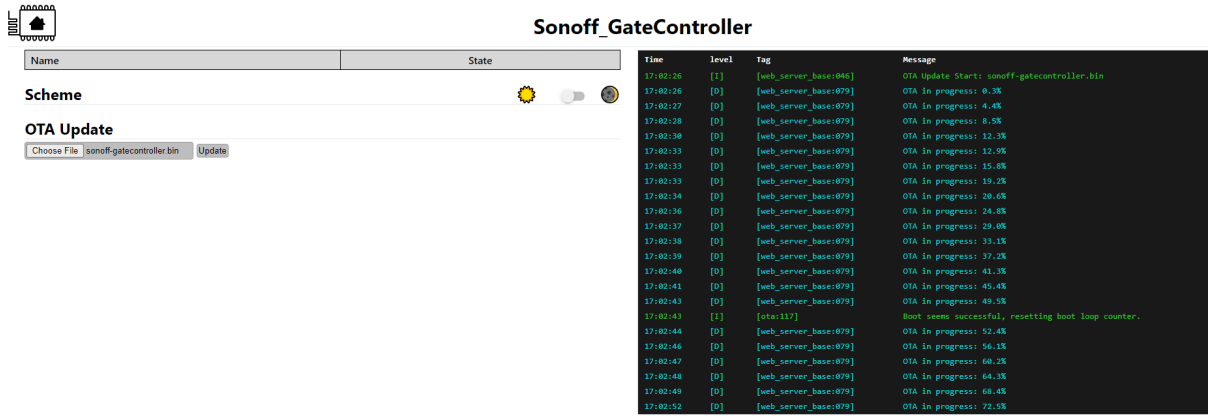



Select the “OTA update” link and save the file to your computer. Use the OTA image for updating an already-flashed controller through its web interface; a factory image is intended for initial flashing.

Once it's downloaded, navigate to the IP Address of the gate controller using a web browser: (http://[ip_on_your_network] OR http://smart-gate-controller.local )




Under OTA Update, select "Choose File" and browse to the binary file that was downloaded in the previous step. Click Update to update to the latest firmware. The progress will be shown on the right:




An "Update Successful!" message will be displayed once the update is complete. The device will restart once the update is complete to ensure that the latest firmware is loaded.

From here on, the device can be managed from ESPHome in the Home Assistant application. Any future updates should be possible by selecting the 'Wirelessly" option when updating the firmware.

# Additional Capabilities

## Bluetooth

The ESP32-WROOM chip has onboard Bluetooth. The user can use the Bluetooth Proxy functionality in ESPHome to extend the reach for additional Bluetooth Devices connected to Home Assistant.

## Additional GPIO Connections

The Smart Gate Controller also allows the user to connect additional devices using the exposed GPIO pins. This can include things like Temperature and Humidity sensors, etc.

Using Port CN3, the user can connect as follows: (Some soldering will be required)

| Pin | Name | Description | Notes |
|---|---|---|---|
| 1 | +3.3V DC | 3.3V DC Supply | |
| 2 | GND | Ground | |
| 3 | GPIO22 | GPIO | ***Please note this one is incorrectly marked as GPIO23 on the back of the board!*** |
| 4 | GPIO19 | GPIO | |
| 5 | GPIO21 | GPIO | |

Depending on the device that is added, the user needs to add the additional configuration in ESPHome. If successfully configured, the added device will show up in ESPHome.

***Note:*** *The GPIO on Pin 3 above is incorrectly indicated as GPIO23 on the back of the PCB. Please note that this pin is connected to* ***GPIO22****!*

## Programming the device

In the event that Over-the-Air (OTA) programming is NOT working, you need to use an FTDI adapter to connect a computer to the board. The device can be placed into Programming mode by shorting J1 during startup. The FTDI adapter needs to be connected to CN4:

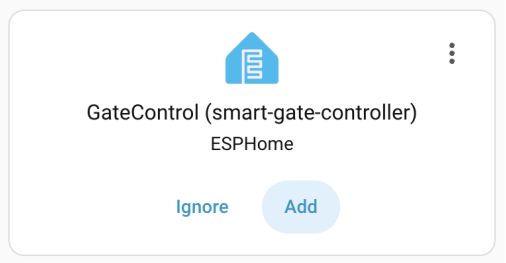
- 3.3V
- RX
- TX
- GND

Please note that most USB ports cannot deliver enough power to run the ESP Chip while programming it. You may need to plug the unit into an additional power source.

# Integrating device into Home Assistant

When the device is on and configured as per the previous steps, it should appear under “Settings | Devices & Services” as a newly Discovered Device:

***Note**: The name indicated below may be different depending on what the user set with the updated Firmware!*




Here you can click “Add” to add the integration to your Home Assistant.




The remaining steps are to add the device to your dashboard and/or configure automations based on the device status.

# Disclaimer:

This product is intended for use in automating gate systems and must be installed and operated with caution. Automated gates can cause serious injury, death, or property damage if not properly configured and used.

- A functional safety beam or obstruction detection system **must be installed and operational** before enabling remote closing of the gate.
- The unit must be installed in a safe location, isolated from electrical hazards and moving mechanical components.
- Ensure the device is within reliable WiFi coverage for proper operation.
- It is the user's responsibility to implement appropriate security measures, including OTA passwords, encryption keys, and web interface authentication.

This product is provided "as-is" without any guarantees or warranties. The user assumes full responsibility for installation, configuration, and operation.

The manufacturer shall not be held liable for any direct, indirect, incidental, or consequential damages, including but not limited to injury, death, loss of data, or property damage arising from the use, misuse, or inability to use this product.

Improper installation, modification, or use outside of the intended purpose will void any warranty and liability.

Installation should be carried out by a qualified professional in accordance with applicable local laws and safety regulations.

# References

- Github Repository for code: https://github.com/HomeAutomationsXYZ/SmartGateController.git
- ESPHome Captive Portal: https://esphome.io/components/captive_portal

# Support

For any queries, or if you run into problems, please email: support@homeautomations.xyz

I hope you enjoy using this unit as much as I enjoyed building it!

Be sure to check back soon for more exciting and innovative  products!