MyGenWashy: Modernizing Old Appliances

We have **developed generic electronics** for **washing machines** that **modernize old appliances** and **integrate** them **into** a **Smart Home** for **monitoring** and **energy efficiency**.

Smart electronics can transform old physically working washing machines into sustainable, repaired & more intelligent appliances than before.

AISLER

IoT AUSTRIA

Farnell
AN AVNET COMPANY

Mariahilfer i

www.mayermakes.at

By Clemens, Thomas & Patrick

Powered by Mayer Makes, IoT Austria & Mariahilfer i

Goal of the Hackathon

Generic electronic components

Development of a universal control system for washing machines

Gain knowledge

Understanding and documenting the components of a washing machine

Smart Home Integration

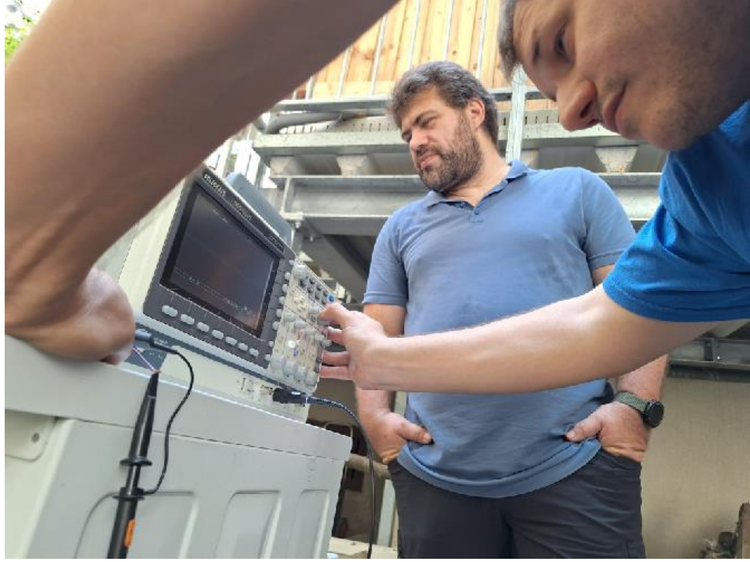
Connection to modern home automation systems

Open Product Pass => http://odpp.at/ (July 2025)

Create & customize digital documentation for CURRENT products

Circular economy

What have we learned?



Security Functions

Surprisingly **simple** and effective **security mechanisms** in **AEG** and **Chinese control board**.

Established design

Many identical components like Darlington ULN2003 driver for relay control

Price optimisation

High-quality washing machines have achieved an **excellent price/component ratio.** The main difference: **Interface**

Surprising discoveries

Water level control – by air pressure !?

Simple **air membrane** and **air pressure => That was unexpected!**

Direct control

230V circuit without complex electronics **=> simplicity is King!**

Security system

Mechanical protection against overflow and overheating **=> Safety first** – also on Chinese generic boards!

Conclusions

Sophisticated technology

The **operating principle** of a washing machine is **fully developed** and **optimized**

Circular Economy

High-quality machines can simply **continue** to be operated with **new electronics.** QED ☺

Sustainability: Refabrication, Pimp

Replacing the electronics of an old washing machine with a **generic** one that has more **energy-saving** functions and is **easier** to control. This **saves resources** and **reduces electronic waste**!

Results of the Hackathon

Schematic for circuit v1/3

GitHub - mayermakes/MyGenWashy: Generic washing Machine Controller - Result of the TuttleButtle Hackathon 2025

Component list v1/3

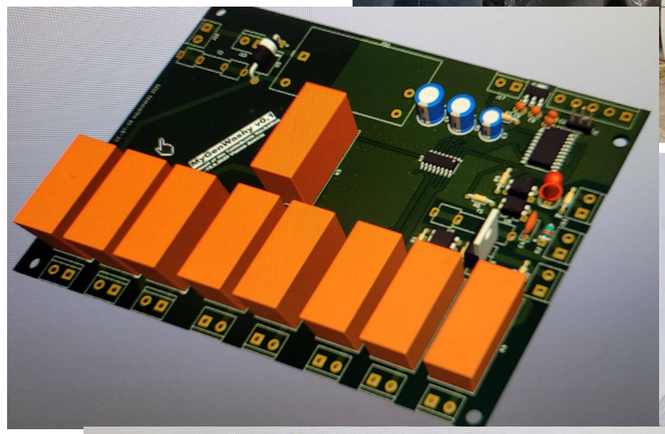
Complete component documentation

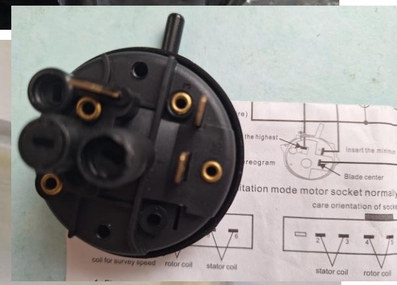
Board v1/3

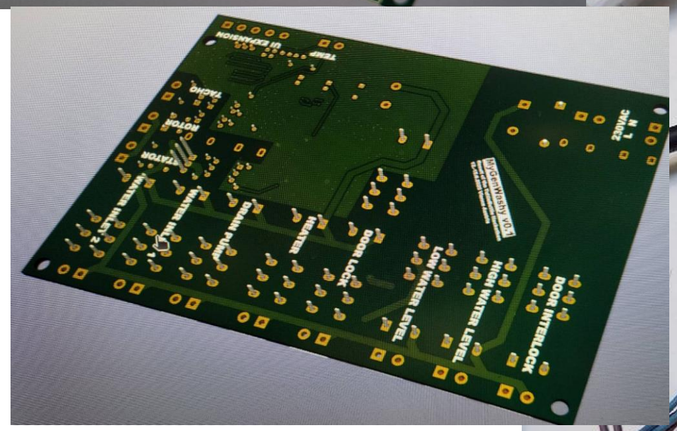
PCB design for the MadWashyMax Edition

Smart Home Integration

PCB design for the MadWashyMax Edition (intermediate Version here – will be updated once PCB Board v1 is here …)







```yaml
esphome:
  name: mygenwashy-v2
  friendly_name: MyGenWashy-v2
esp32:
  board: esp32dev
  framework:
    type: arduino
logger:
  level: VERBOSE

output:
  - platform: gpio
    pin: GPIO32
    id: relay_pin_1_relay_cold_water_valve
  - platform: gpio
    pin: GPIO33
    id: relay_pin_2_relay_pump
  - platform: gpio
    pin: GPIO25
    id: relay_pin_3_relay_montor_stator
  - platform: gpio
    pin: GPIO26
    id: relay_pin_4_relay_montor_aktor
  - platform: ledc #PWM Motor Speed
    pin: GPIO27
    frequency: 1000 Hz
    id: pwm_motor
switch:
  - platform: output
    id: switch_relay_cold_water_valve
    name: "R1 - Kaltwasserventil"
    icon: mdi:Water
    output: relay_pin_1_relay_cold_water_valve
    restore_mode: RESTORE_DEFAULT_OFF
  - platform: output
    id: switch_relay_relay_pump
    name: "R2 - Wasser abpumpen"
    icon: mdi:Pump
    output: relay_pin_2_relay_pump
  - platform: output
    id: switch_relay_montor_stator
    name: "R3 - Motor Stator"
    icon: mdi:Motor
    output: relay_pin_3_relay_montor_stator
  - platform: output
    id: switch_relay_pin_4_relay_montor_aktor
    name: "R4 - Motor Aktor"
    icon: mdi:MotorAktor
    output: relay_pin_4_relay_montor_aktor

fan: #Washing Machine Rince Speed
  - platform: speed
    output: pwm_motor
    name: "Motor Rotor Speed 3"
    icon: mdi:fan-speed-3
  - platform: speed
    output: pwm_motor
    name: "Motor Stator Speed 2"
    icon: mdi:fan-speed-2

sensor:
  - platform: ntc  #NTC
    sensor: resistance_sensor
    calibration: #datasheet - or calkibrated - user instrcutions - MrWashyBalls
      #- 10.0kOhm -> 25°C
      #- 27.219kOhm -> 0°C
      #- 14.674kOhm -> 15°C
      b_constant: 3950
      reference_temperature: 25°C
      reference_resistance: 10kOhm
    name: "Water Temperature (NTC)"
    icon: mdi:thermometer-snowflake

  - platform: resistance
    id: resistance_sensor
    sensor: source_sensor
    configuration: DOWNSTREAM
    resistor: 5 kOhm #Messen
    name: Resistance Sensor

  - platform: adc
    id: source_sensor
    pin: GPIO35
    update_interval: 60s

  - platform: gpio
    pin:
      number: GPIO34
      mode: INPUT
      inverted: false
    name: "Umdrehungssignal"
    filters:
      - delayed_on: 10ms
      - delayed_off: 10ms
    icon: mdi:counter
```

Home Assistant

ESPHome

ESPHome &
Home Assist

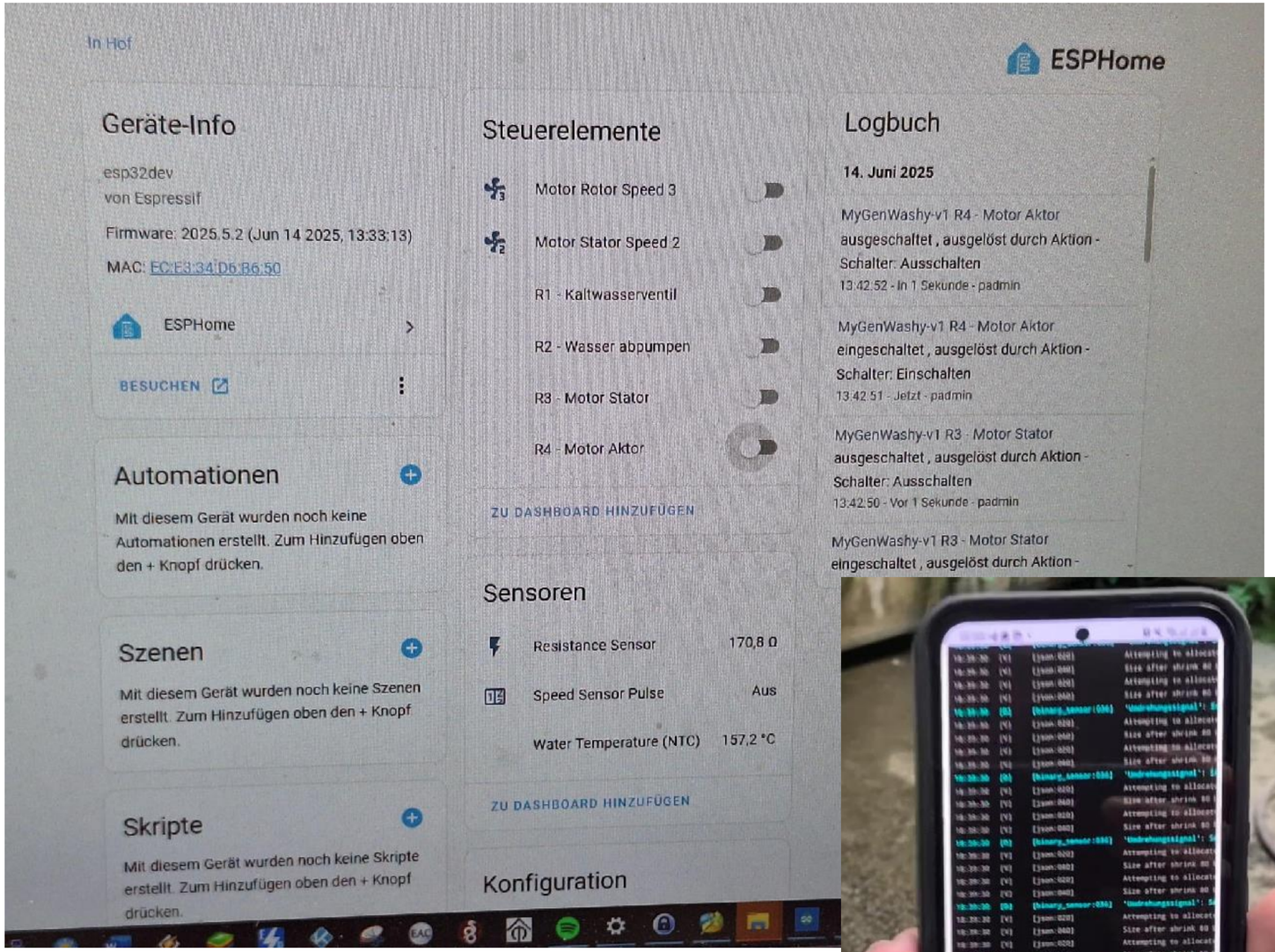
[ESPHome - Home Assistant]

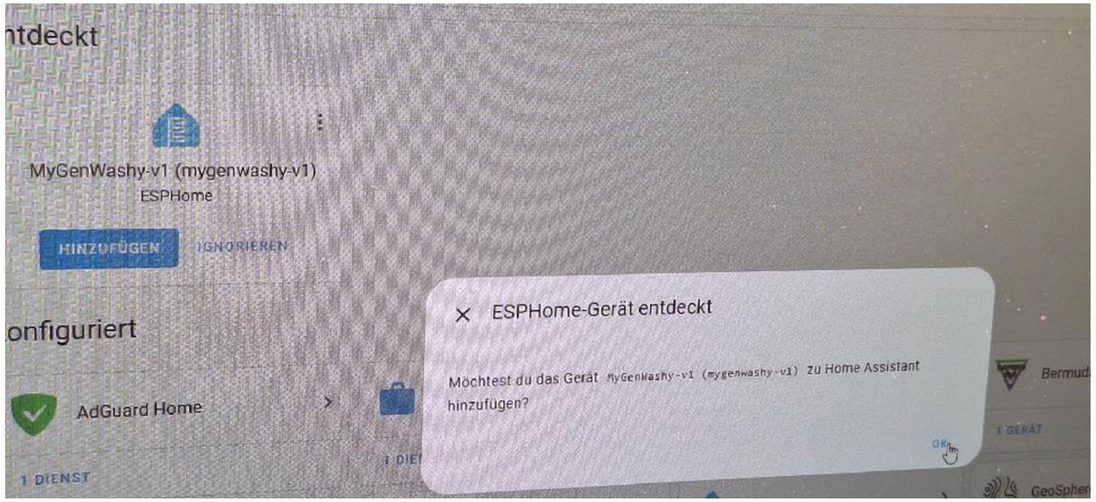
mygenwashy-v1.yaml

remarks:
Motor driver & NTC calibration will follow in v2

OnPrem Smart Home

Post-apocalyptic SmartHome integration made possible without stealing your data





Re-uses old Smartphone as display!

Minimal Arch / i2c Bus / OnPrem Smart Home

	A	B	C	D	E	G
1		Funktion	Sensor/Acto	Volt	typ- esphom	Cold Wash
2	WARM	Hot Water Valve (n/a)	Actor	230V?	switch	No
3	MAIN	Cold Water Valve	Actor	230V?	switch	Yes
4	RINSE	Rinse Valve	Actor	230V?	switch	Yes
5	DRAIN	Drain Pump	Actor	230V?	switch	Yes
6	LOCK	Control Wire Door Live (do not open door)	Sensor	0-230V	binary…	n/a
7	ROTOR	Motor	Actor	0-230V	switch	Yes
8	ROTOR	Motor	Actor	0-230V	switch	n/a
9	STATOR	Motor	Actor	0-230V	switch	Yes
10	STATOR	Motor	Actor	0-230V	switch	n/a
11	HEAT	Heat Pipe	Actor	0-230V	switch	No
12	HEAT	Heat Pipe	fix	NULL	fix	No
13	HIGH LVL	Max Water	Sensor	0-230V	binary…	n/a
14	DOOR ZERO	Door Closed	Sensor	0-230V	binary…	ZERO
15	LOW LVL	Min Water for Heat	Sensor	0-230V	binary…	n/a
16	TEMP SENSOR	Temperature Sensor / NTC / MCU	Sensor	0-3,3v	DAC	Yes
17	TEMP SENSOR	Temperature Sensor / NTC / MCU	Sensor	0-3,3v	DAC	yes
18	SPEED	Similar Hall	Sensor	0-3,3v	Digital …	Yes
19	SPEED	Similar Hall	Sensor	0-3,3v	n/a	Yes
20	LINE	L-Live (Phase)	n/a	230V	n/a	n/a
21	ZERO	N -Naught (Null leiter)	n/a	NULL	n/a	n/a

Modified MadWashyMax

Hardware modification

Installing the new control board in the existing washing machine

Software integration

Control via Home Assistant with individual programs. Energy savings.

Location

The modified washing machine is in operation @Mariahilfer i

Follow-Ups & Spin-Offs

Open Digital Product Pass – ODPP

Examples of 4 household appliances incl. MadWashyMax => in July check http://odpp.at/

Energy-optimized water heating

Real-time control for maximum efficiency

Washing quality monitoring

StartUp idea for monitoring cleaning performance

EnergyMate

Control with dynamic electricity prices (StartUp)

Future vision

Promoting sustainability

Extend the service life of household appliances.Washing machine => e-toothbrush => washing machine .... etc...

Build a community => http://odpp.at/ (July)

Share knowledge and experiences.

Driving innovation forward

Develop new applications for existing technology. Which can be used TODAY by anyone!

Our project shows how we can use open source technology to reduce e-waste and create new business models at the same time

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Tadaaa!

Water
+ Turning
+ Pumping +
SmartHome!

Mariahilfer i

IoT AUSTRIA

https://www.youtube.com/watch?v=hsNMwX28xyA

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Professional Maker
since 2020 (Foundign of MAYER MAKES e.U. 2017)
Autodidact

Commercial Filming Diploma
Certified 3D printing Trainer
Certified CE Productcoordinator
Host of the Element14 Community Youtube Channel
www.community.element14.com/presents

CE-Product Coordinator
CERTIFICATION BODY
N° CE24NOE0004
WIFI WKO
VALID: 04/2027

Experience:
Various electronics projects in collaboration with nationnal and international companies.
Several hundred projects fully documented and open source.

Founder **smander.com**
Consulting and Services regarding CE compliance.
Specialized on the needs of Small Businesses, Start-Ups and Open Source Hardware.

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we make product compliance as easy as online shopping

DI Patrick Ch. AWART

Principal Solution Architect

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Sprachen: D, E, F

stolzer Vater von 2 Kindern (Bea hat mit 4 Jahren löten gelernt)

Hobby: Hiking/Volleyball/ MTB

Kreislaufwirtschaftliche Entwicklung im Bestand Energiegemeinschaften & Lastprofil-optimierung

Co-Gründer Mariahilfer i Nov 2024 360° Gräzl-Resilienz

CLIMATE LAB | Community Member

Ausbildung:

- Master TU Wien / Technische Informatik 2001
- Data Science / Hopkins Universität 2017

Kernkompetenzen:

- Innovation Lead / Guide for Digital Transformation
- KI Experte & Data Scientist
- Wissensmanagement
- Complex System Assessment / Evaluation

- AI Roadmap & Strategiefindung
- Smart Product Use Case Entwicklung, Bewertung, Spezifizierung und Umsetzungsverantwortung

- Python / Node js / IoT / … / (No-)SQL / Elastic Stack / diverse Programmier & Abfragesprachen von C über X++ und lua bis mircopython der letzten 35 Jahre.

Mariahilfer i

Fortbildung, Kurse & Zertifizierungen:

- Google Advanced AI Solutions 2019
- Azure ML 2018
- Scrum Master 2018
- Zertifizierter Innovationsmanager 2008
- Microsoft Certified Professional 2013

Projekte / Erfahrung:

Maßgebliche fachliche Leitung von Digitalen Transformationsprojekten in den Branchen SmartCity, eGoverment, Public Health & Krisenmanagement Systeme - seit 25 Jahren.

- Von der Vision über die Prozess- & Anforderungsanalyse bis hin zum Go Live

- Strategieentwicklung und Umsetzung

- DPP / Digitaler Produktpass
- ODPP / Offener DPP

- Kintsugi Repair Cafe
- (u.a. Wohn Interieur)

- KI-Wissensmanagement

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JOIN US for v2, v3 & StartUps!

Get in touch and participate in our future projects advancing open source and reusability

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Thomas Losert

Clemens Mayer

IoT AUSTRIA

Open Digital Product Pass
=> http://odpp.at/ (July 2025)
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www.mayermakes.at

MANY Thx go to:

Albert (pixs, Transport, Vids, PPT !),
Johanna (Washing machine!),
Birgit (UX Feedback & Requirements Feedback),
Boots Owen (Many Many Useful tips!!!) check out: https://youtu.be/f2Fo3-SVfDs
Farnell – components
Aisler – PC Board
Infineon – AI Boards
Gorenje – CircThread Inspiration for ODPP!
D. (crimping!)
Kintsugi Repair Café (Space!)
CargoBike!
Gemma, CoPilot, etc. Cool AI Pictures raising the Adrenalin Levels!
Elektra and Nescafe Coffee machine
RuSZ: David & Dagmar – Aligning
Elektro Kuchling: Feedback of current sales practice & Inspiration on ReUse Ideas
Generic (!!!) Water Adapter from WaterFront lying around – you saved us!
!!! Let's keep up the great Work & Vibes!!!