Legend

Power Supply 24V
Power Supply 5V
GND
GPIO (ESP32)
GPIO Input only (ESP32)
I2C-Signal (MCP23018)
I2C-SCL
I2C-SDA

0 – External

Power Supply
24V
3.75A
90W
Outside (-)
Inside (+)
GND
VCC
DC Power Plug

1 – Incoming Goods

DC-DC-Converter
5V 6A 30W
VOUT+
GND
VIN+

Outside (-), Inside (+)
DC Power Jack

Power Switch

Solenoid 24V
1N4007
IRLZ44N
R 1 kΩ
R 10 kΩ

Fan
PN2222A
R 1 kΩ

SK6812 RGBW 5V LED Strip 60LEDs/m
#1 23 LEDs
GND
DIN
DOUT
VCC

LED
white #1
R 1 kΩ

PWM
Servo #1

VCC_5V
OUT
GND
LM393
Photoelectric Counter Modul

Grove – 4-Digit Display
GND
VCC5V
DIO
DCLK
DP1
DP2
DP3
DP4

2 – Manufacturing

DC-DC-Converter
5V 6A 30W
VIN+
GND
VOUT+

SK6812 RGBW 5V LED Strip 60LEDs/m
#2 3 LEDs

Stepper Motor
with Driver
5V
GND
IN1
IN2
IN3
IN4

R 10 kΩ
R 1 kΩ
2N2907
PNP
LDR
LED
white #2
1N4007
Buzzer
R 100 Ω
LED
red #1

ESP32 Dev Board
USB-C
5VIN
FLASH-CMD
FLASH-D3
FLASH-D2
GPIO13/ADC2_4
GND
GPIO12/ADC2_5
GPIO14/ADC2_6
GPIO27/ADC2_7
GPIO26/ADC2_9
GPIO25/ADC2_8
GPIO33/ADC1_5
GPIO32/ADC1_4
GPIO35/ADC1_7
GPIO34/ADC1_6
GPIO39/ADC1_3
GPIO36/ADC1_0
EN/RESET
3.3V
FLASH-CK
FLASH-D0
FLASH-D1
GPIO15/ADC2_3
GPIO2/ADC2_2
GPIO0/ADC2_1
GPIO4/ADC2_0
GPIO16/RX2
GPIO17/TX2
GPIO5
GPIO18
GPIO19
GND
GPIO21/I2C-SDA
GPIO3/RX0
GPIO1/TX0
GPIO22/I2C-SCL
GPIO23
GND

U1
BSS138_4ch
LV4
LV3
GND
LV
LV2
LV1
HV4
HV3
GND
HV
HV2
HV1

MCP23018
VSS
NC
GPB0
GPB1
GPB2
GPB3
GPB4
GPB5
GPB6
GPB7
VDD
SCL
SDA
NC
GPA7
GPA6
GPA5
GPA4
GPA3
GPA2
GPA1
GPA0
INTA
INTB
NC
Reset
ADDR

R 10 kΩ
R 10 kΩ
R 10 kΩ

I2C LCD Modul
SCL
SDA
VCC_5V
GND

LED
blue
R 1 kΩ
Push Button #1

LED
white #4
R 1 kΩ
Push Button #2

LED
red #2
R 1 kΩ
Push Button #3

I2C TOF Distance Sensor
SCL
SDA
GND
VIN_5V

ESP32 Dev Board Pin Numbers

Always refer to the GPIO number, not the physical pin number.

The pin numbers in this GPIO pinout refer to the ESP32 dev board used in this Factory Box build. On other boards, the physical pin layout may vary.

However, the GPIO numbers are consistent across all ESP32 boards.

2 – Outgoing Goods

SK6812 RGBW 5V LED Strip 60LEDs/m
#3 17 LEDs
GND
DIN
VCC

Grove LED-Bar v2.0 Modul
GND
VCC
DCKI
DI

Push Button #4

Grove Air Quality Sensor
GND
VCC_5V
AOUT

DHT11
GND
DATA
VCC

Motor_Servo #2
PWM

5V 6A 30W
DC-DC-Converter
VIN+
GND
VOUT+

R 220 Ω
LED
white #3

Hochschule Aalen, University of Alberta
Sheet: /
File: factorybox_schematic.kicad_sch
Title: FactoryBox – electrical layout
Size: A2 | Date: 2026-01-12 | **Rev: 2**
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