

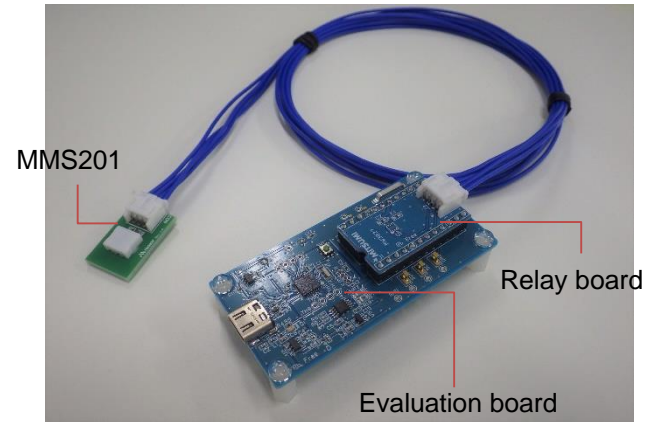
Temperature and Humidity Sensor Module

MMS201 Evaluation Kit Manual

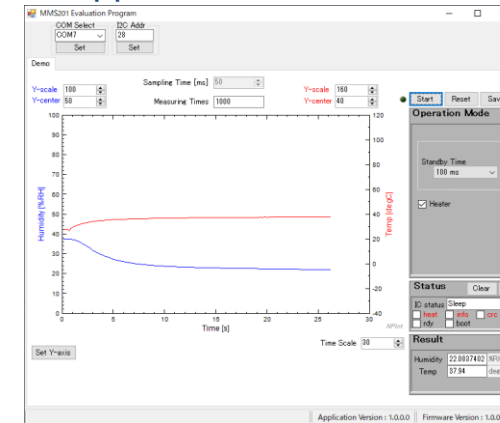
Rev.1.0

Evaluation kit consists

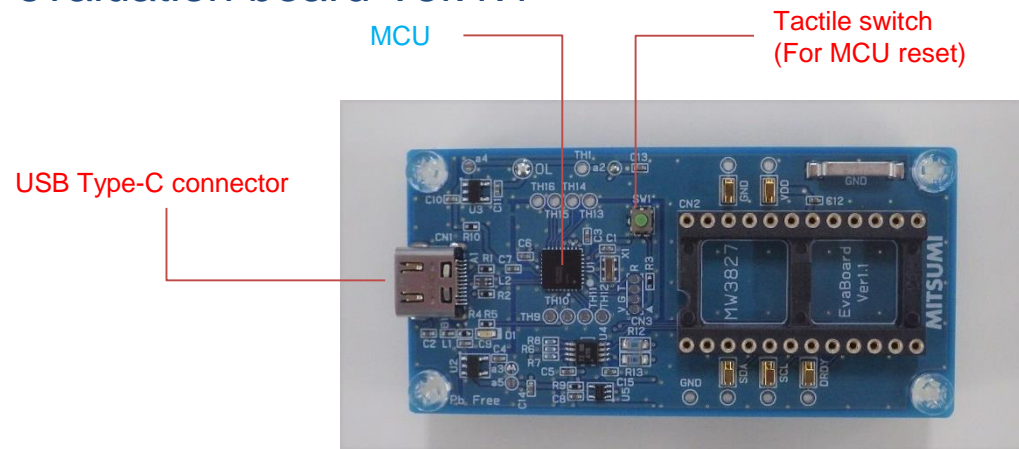
This evaluation kit consists of the evaluation board Ver.1.1, relay board, the MMS201, and the PC application software.



PC application software



Configuration of evaluation board Ver.1.1



Evaluation Application

When the “MMS201_EvaluationProgram_ver.1.x.x.x.zip” file is unzipped, the file structure is as follows.

* Do not change the file structure.

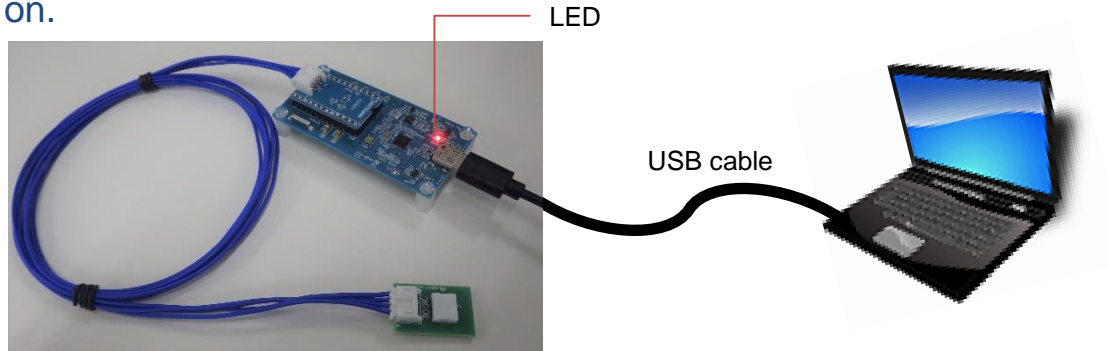
MMS201_EvaluationProgram_ver.1.x.x.x
├ MMS201_EvaluationProgram.exe : Application
├ NPlot.dll : Library for drawing graphs
└ UserData : Data storage folder

* “.NET Framework 3.5” is required.

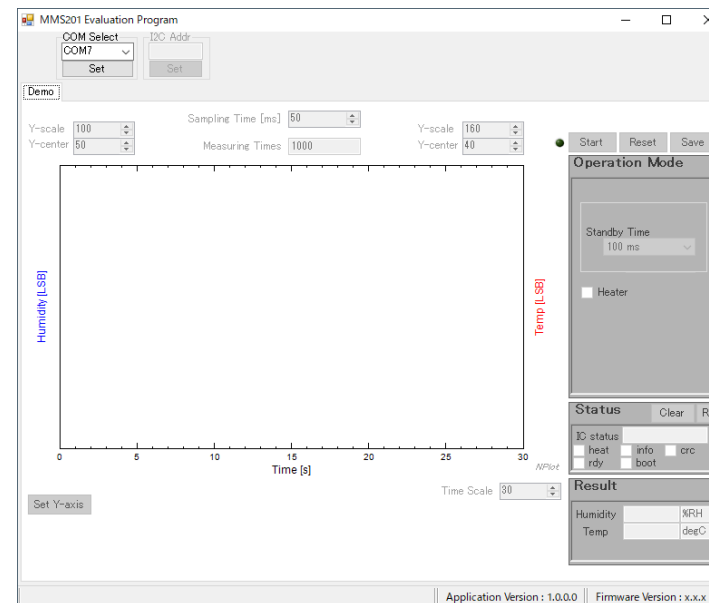
If it is not installed, download the file from Microsoft website and install it.

Evaluation procedure

1. Connect the evaluation board to the PCs with USB Type-C cables.
LED turns on.

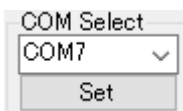


2. Execute the evaluation application “MMS201_EvaluationProgram.exe”.
The following window opens.



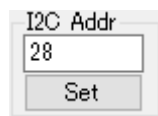
Evaluation procedure

3. Select the COM port number of evaluation board from the dropdown.
Click the “Set” button to establish communication between the application and the evaluation board.



COM Select
COM7
Set

4. Specify the I2C Slave Address(Hexadecimal) in the “I2C Addr” box. (default value: 0x28)
Click the “Set” button to establish communication between the evaluation board and the sensor.



I2C Addr
28
Set

5. Specify the number of data to be measured in the “Measuring Times” boxes.
(This is specified 1000 times when the evaluation application is started.)

Measuring Times

6. Start measurement.
Click “Start” button.

Start

It will end when the specified number of measurements is reached or when the “Stop” button is clicked.

Stop

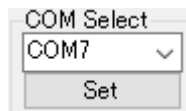
Measurement screen

The screenshot displays the 'MMS201 Evaluation Program' interface. It features a central graph area for data visualization, surrounded by various control panels and status indicators. Numbered callouts highlight specific components:

- ①** Points to the 'COM Select' dropdown menu, currently set to 'COM7', and the 'I2C Addr' input field.
- ②** Points to the 'Start', 'Reset', and 'Save' buttons located in the top right corner of the main interface.
- ③** Points to the 'Operation Mode' panel, which includes a 'Standby Time' dropdown (set to 100 ms) and a 'Heater' checkbox.
- ④** Points to the 'Status' panel, which shows 'IC status' (heat, rdy, info, boot) and 'crc' (info, boot) checkboxes.
- ⑤** Points to the 'Result' panel, which displays 'Humidity' and 'Temp' values with their respective units (%RH and degC).
- ⑥** Points to the graph area, which is currently empty. The y-axis is labeled 'Humidity [LSB]' and the x-axis is labeled 'Time [s]'. A 'Set Y-axis' button is located at the bottom left of the graph area.

Additional visible elements include 'Sampling Time [ms]' (50), 'Measuring Times' (1000), 'Y-scale' (100), 'Y-center' (50), 'Y-scale' (160), 'Y-center' (40), and 'Time Scale' (30). The bottom status bar shows 'Application Version : 1.0.0.0' and 'Firmware Version : x.x.x'.

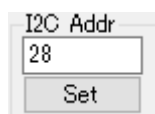
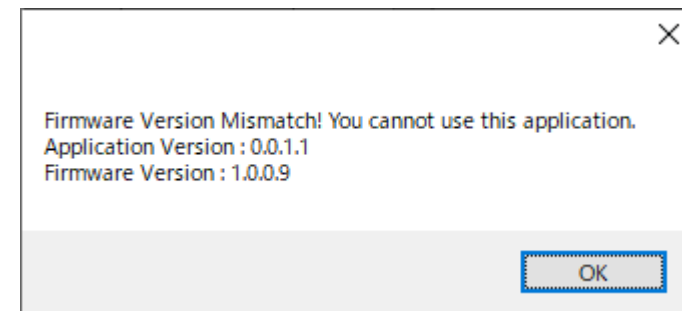
① COM Select / I2C Addr



A COM port can be selected from the pull-down menu. Clicking [Set] button will start communication via the selected COM port.

[Error popup]

If you make a mistake in the connection destination, those popup is displayed

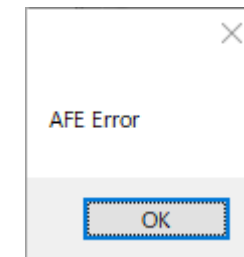


The slave address to be used for the communication between the Evaluation Board (I2C master) and the sensor mounting board (I2C slave) can be set.

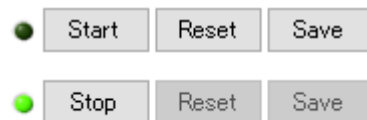
* No slave address assigned to the sensor is changed.

[Error popup]

If you cannot communicate with the sensor, this popup is displayed.



② Measurement Control



- [Start] / [Stop] button
Specifies measurement start / stop.
The measurement starts in the mode specified in ③ “Operation Mode” pane.
During the measurement, all buttons other than [Stop] button are disabled.
When the data is acquired by the number of measurements specified in “Measuring Times” field in ⑥ “Graph” area, the measurement is automatically stopped. Clicking [Stop] button will stop the measurement in the middle.
- [Reset] button
Transmits a reset command.
- [Save] button
Saves the measurement result in a file.
* This button is disabled unless a measurement is performed.

[File format]

Measurement start date and time

```
2021/04/20 13:37:49
Measured Time[s], Humidity[%RH], Temp[degC], Temp[degC]
0.007551,30.14419555566406,29.06,0
0.015702,30.3273010253906,29.02,0
0.125338,30.5027770996094,28.98,0
0.234979,30.6515502929688,28.9,0
```

Elapsed time from the start of measurement [s] Humidity data [%RH] Temperature data [degC]

③ Operation Mode

Operation Mode

Standby Time
100 ms

☐ Heater

- Standby Time
Standby time can be selected.
- Heater
The heater can be selected On or Off in the measurement.

④ Status

Status

Clear R

IC status Sleep

☐ heat ☐ info ☐ crc
☐ rdy ☐ boot

- [Clear] button
Clears errors.
- [R] button
Updates the status information.

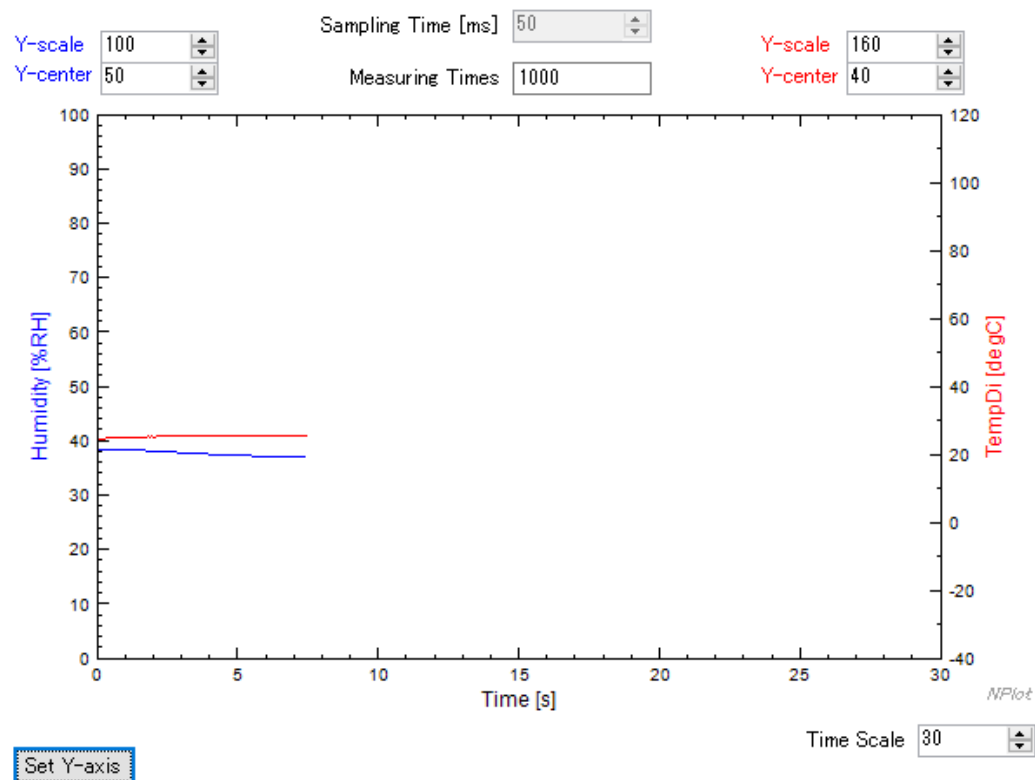
⑤ Result

Result

Humidity %RH
Temp degC

Data after correction is displayed.

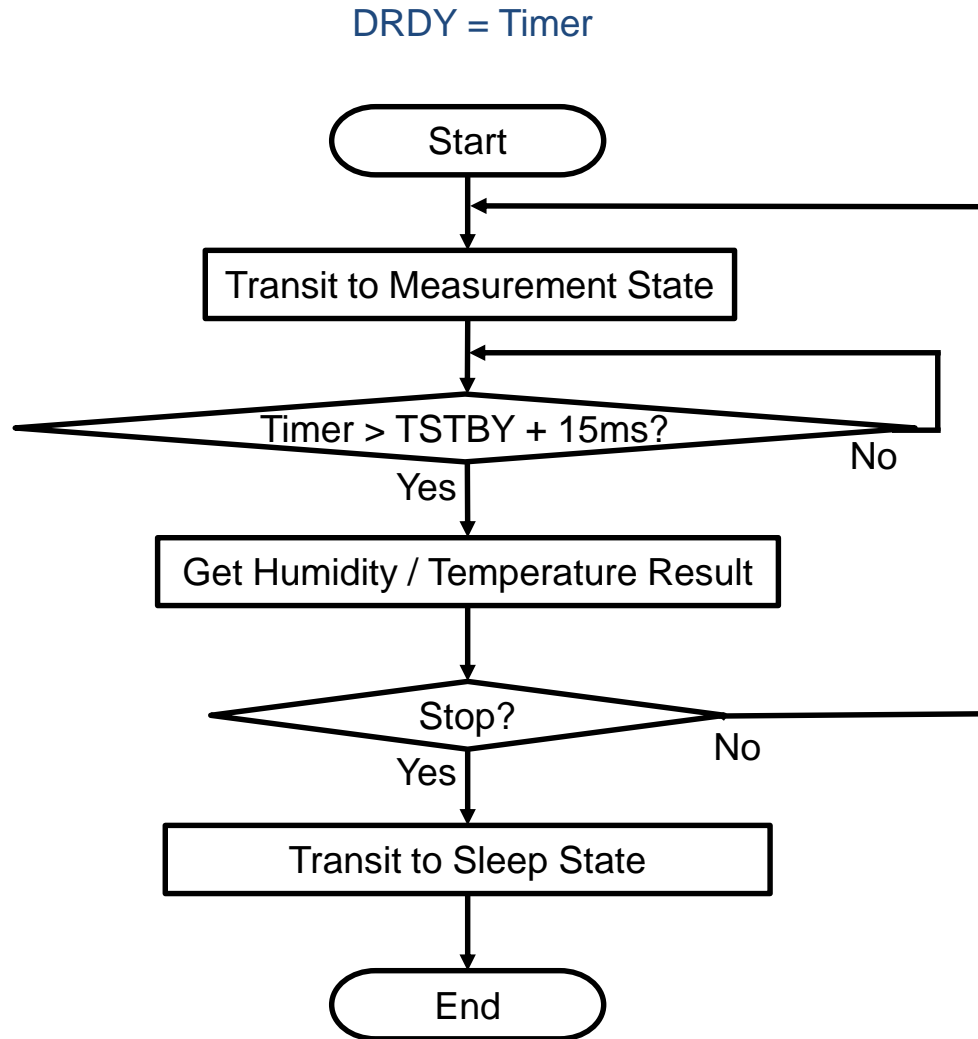
⑥ Graph



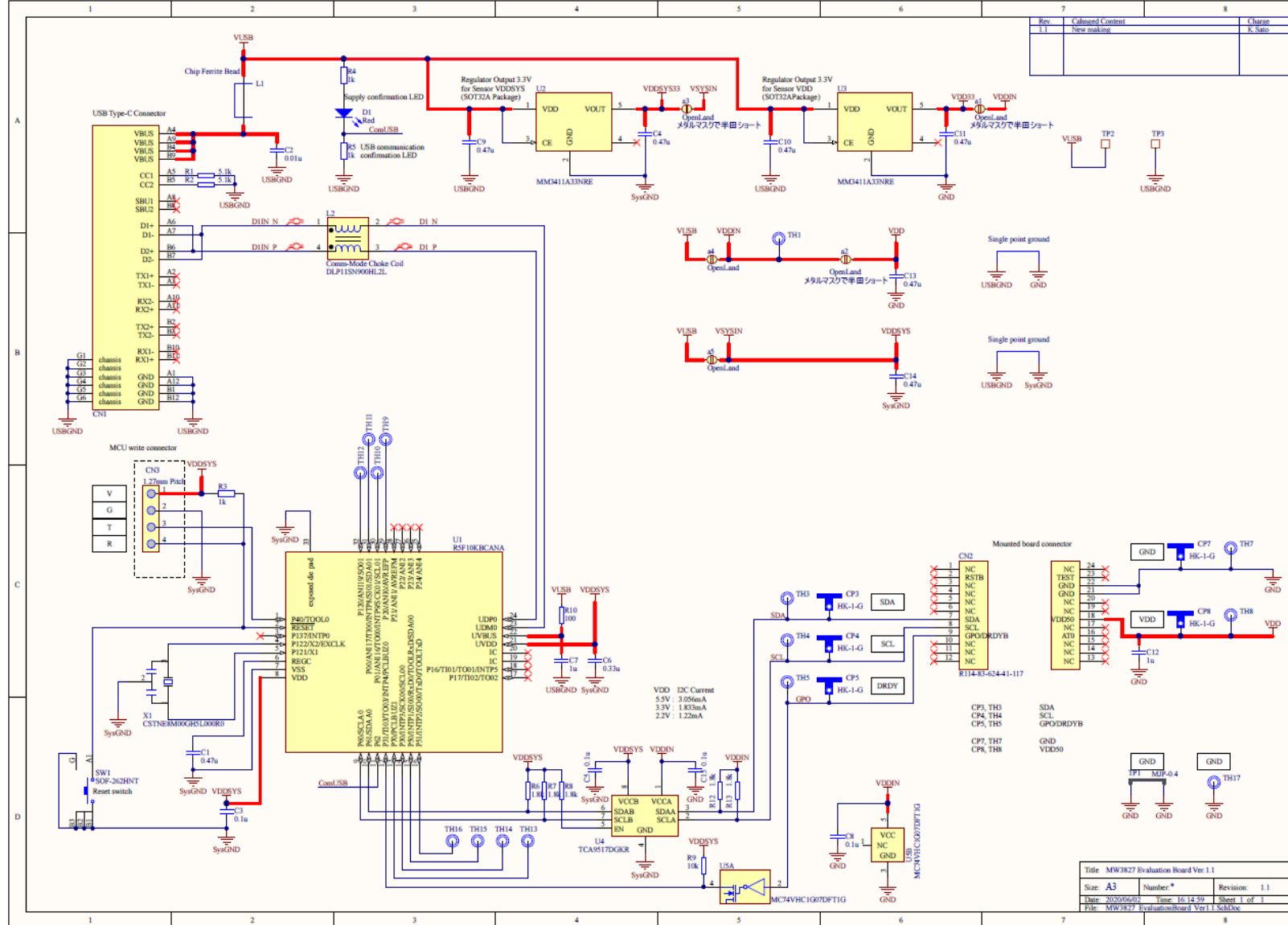
Measurement results can be displayed in the graph.

- [Sampling Times]
When “One Shot” is selected for “Standby Time”, sampling period can be set.
Settable range: 50 - 1000[ms]
- [Measuring Times]
The number of measurements can be specified. The measurement will stop when the data is acquired by the specified number of measurements.
- X axis (time)
The time scale can be specified in [Time Scale] field.
- Y axis (pressure / temperature)
A graph centered at the value specified in [Y-center] field is displayed on the scale specified in [Y-scale] field.
- Scale adjustment
 - [Set Y-axis] button
Adjusts the center of Y axis based on the last measured value.

Operation flow



Evaluation board circuit diagram



Evaluation board parts list

No.	Designator	Model	Value	Description	Quantity
1	C1, C4, C9, C10, C11, C13, C14	LMK105B7474KV-F	0.47uF	Capacitor	7
2	C2	GCM155R71H103KA55D	0.01uF	Capacitor	1
3	C3, C5, C8, C15	GCM155R71C104KA55D	0.1uF	Capacitor	4
4	C6	GRM155R61A334KE15D	0.33uF	Capacitor	1
5	C7, C12	0402ZD105KAT2A	1uF	Capacitor	2
6	CN1	CAM-L05-024-050-ACGAA	-	USB Type-C Connector	1
7	CN2	R114-83-624-41-117	-	DIL Socket 24Pin	1
8	D1	SML-311UTT86	-	LED	1
9	L1	BLM15PD121SN1D	-	Chip Ferrite Bead	1
10	L2	DLP11SN900HL2L	-	Choke Coil	1
11	R1, R2	CRCW04025K10FKED	5.1kΩ	Resistor	2
12	R3, R4, R5	RMC1/16SK102FTH	1kΩ	Resistor	3
13	R6, R7, R8	RK73H1ETTP1801F	1.8kΩ	Resistor	3
14	R9	G1005P-103-B	10kΩ	Resistor	1
15	R10	RMC1/16SK101FTH	100Ω	Resistor	1
16	R12, R13	RK73H2ATTD1801F	1.8kΩ	Resistor	2
17	SW1	SOF-262HNT	-	Tactile Switches	1
18	U1	R5F10KBCANA	-	Micro Controller	1
19	U2, U3	MM3411A33NRE	-	200mA Regulator	2
20	U4	TCA9517DGKR	-	Level-Shifting I2C BusRepeater	1
21	U5	MC74VHC1G07DFT1G	-	Single Non-Inverting Buffer	1
22	X1	CSTNE8M00GH5L000R0	8.000MHz	8MHz Ceramic Resonator	1

Relay board parts list

No.	Designator	Model	Value	Description	Quantity
1	C1	-	Open	Unimplemented	0
2	C2	-	Open	Unimplemented	0
3	U1	-	Open	Unimplemented	0
4	J1	MX3-0	-	Pin Header	1
5	J2	S4B-PH-K-S(LF)(SN)	-	Pin Header	1