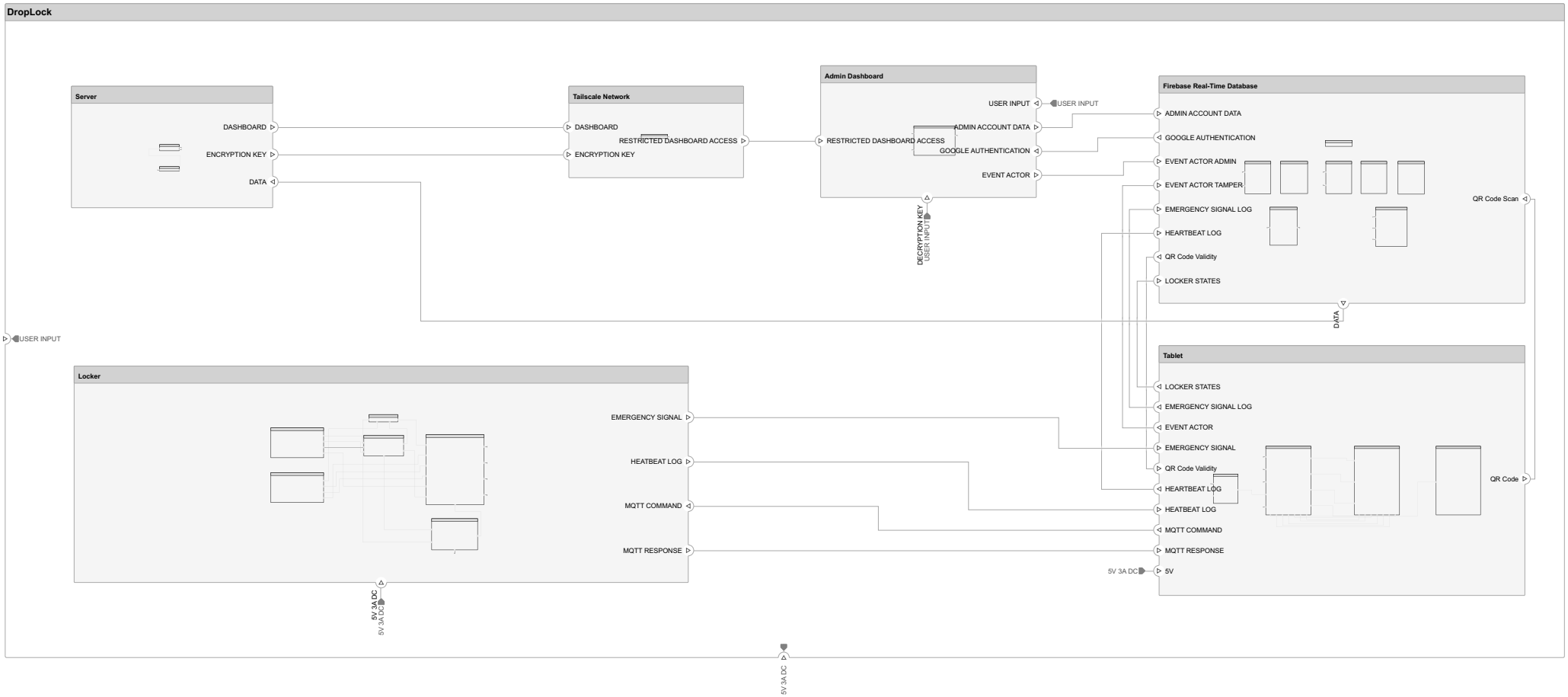
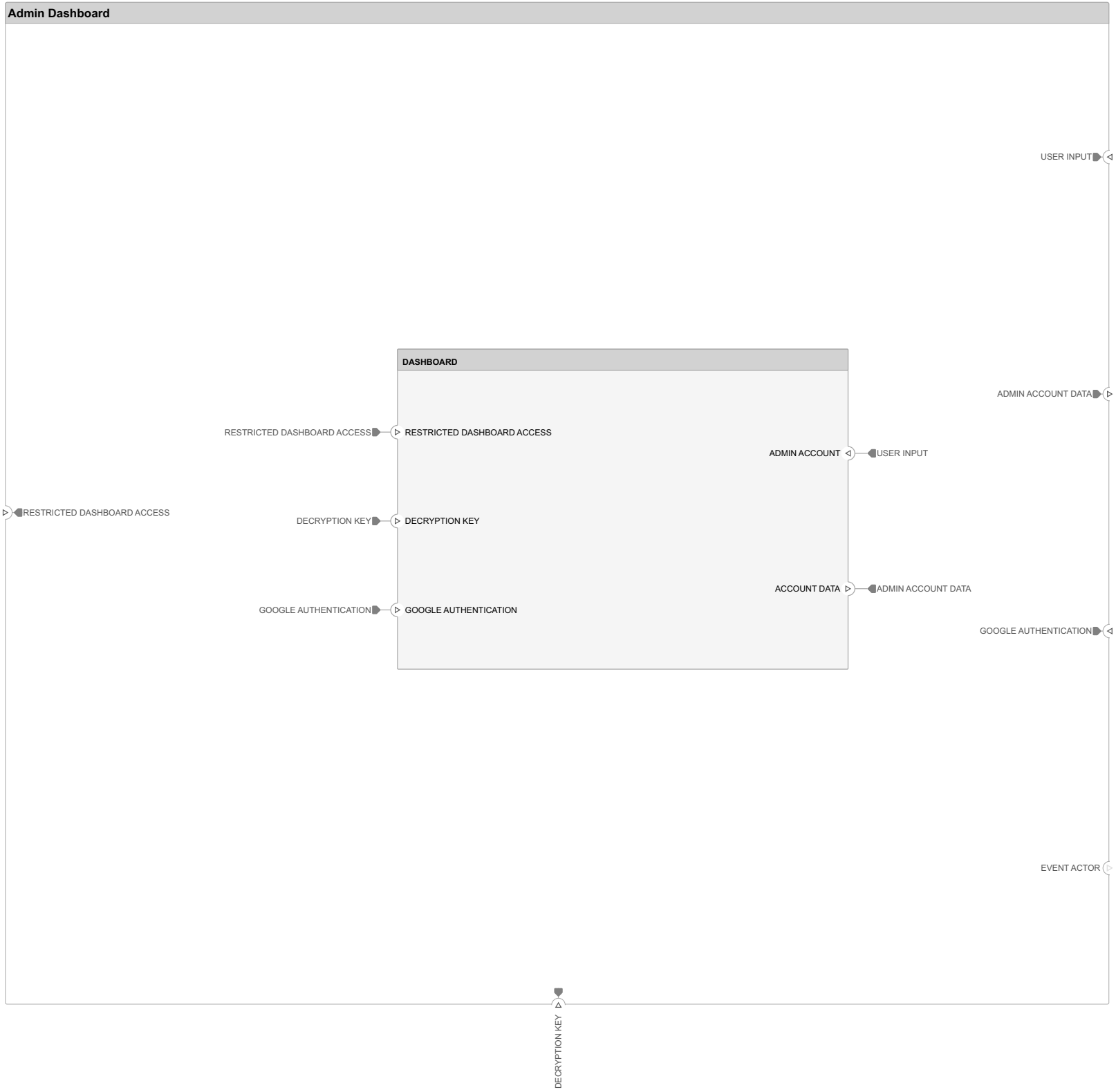
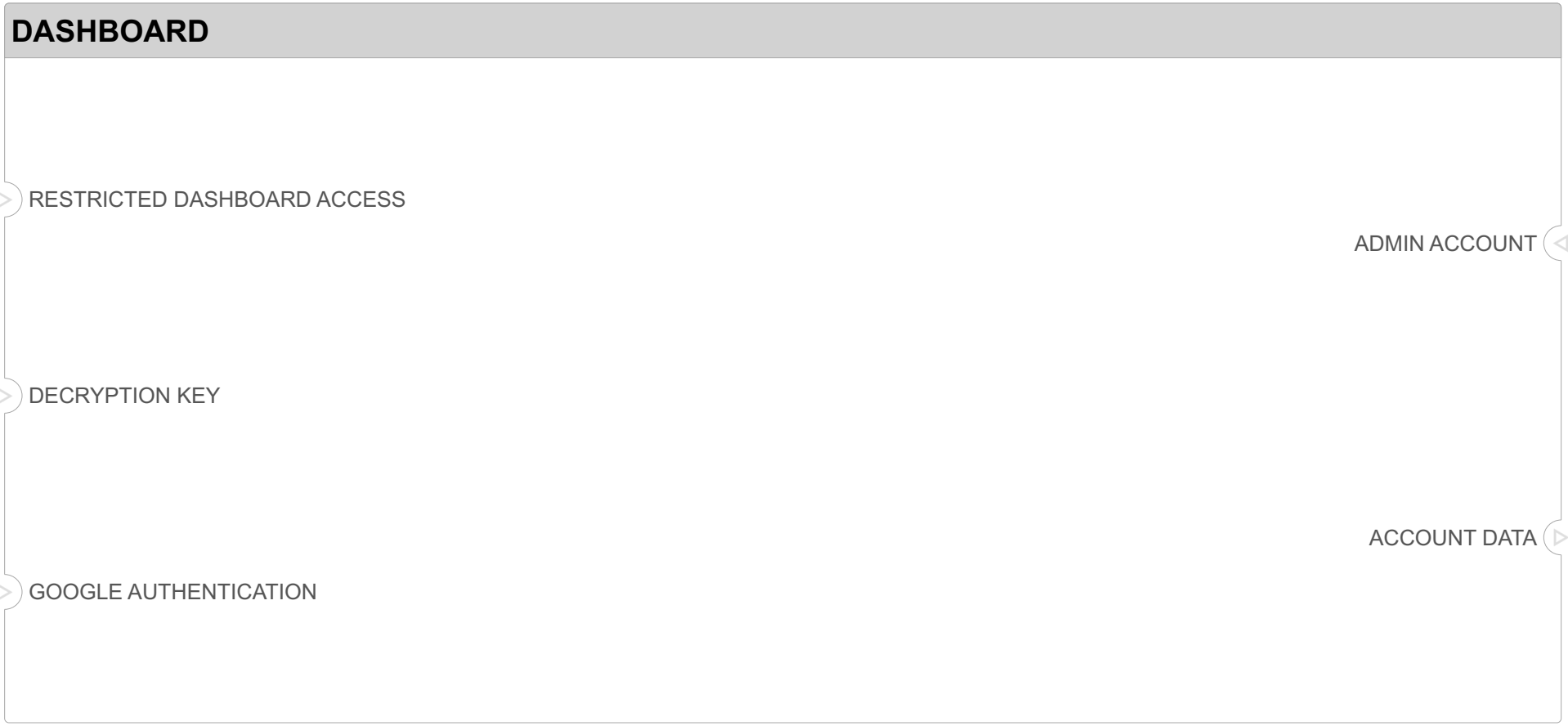
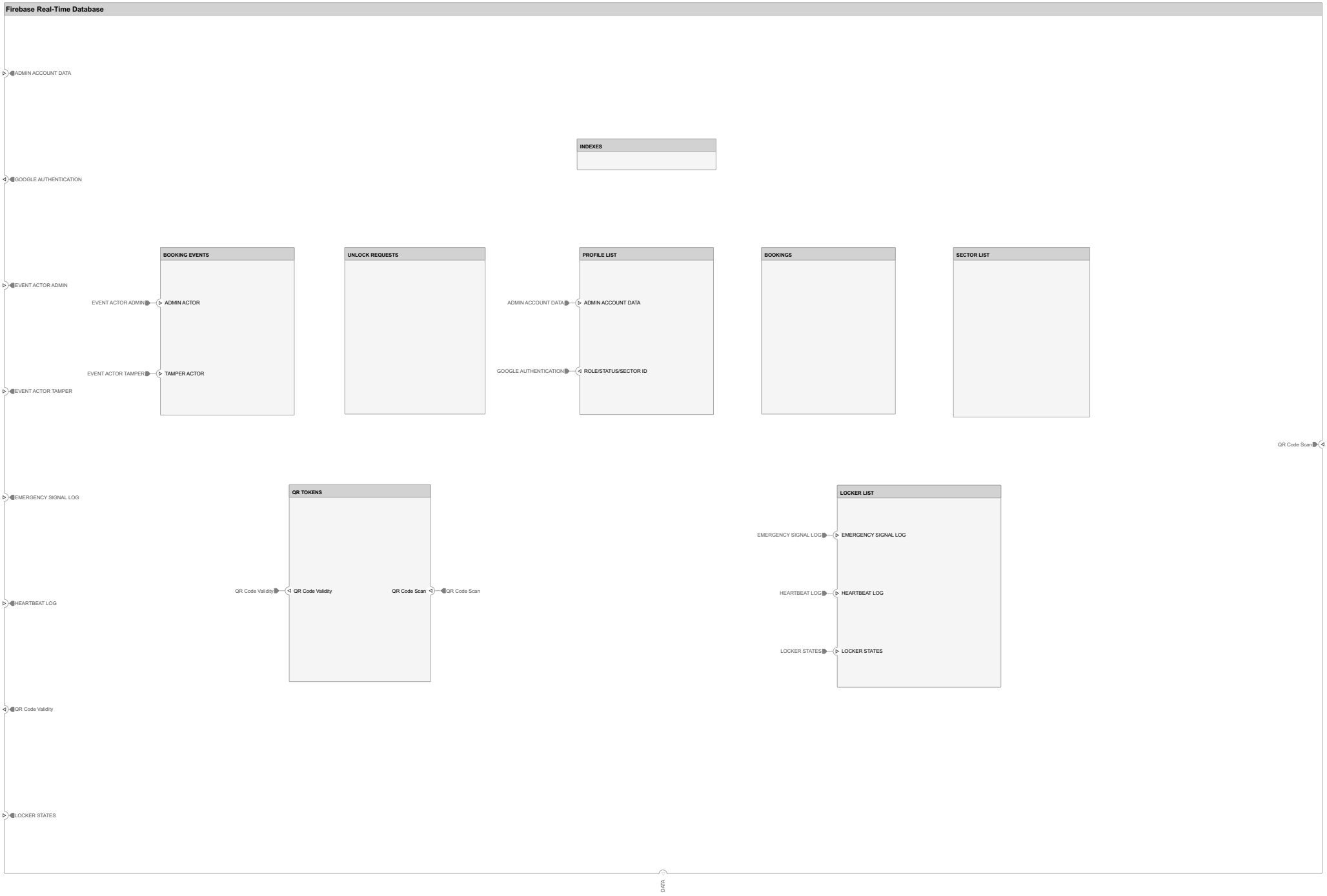

DropLock
Server
DASHBOARD
ENCRYPTION KEY
DATA
Tailscale Network
DASHBOARD
ENCRYPTION KEY
RESTRICTED DASHBOARD ACCESS
Admin Dashboard
USER INPUT
RESTRICTED DASHBOARD ACCESS
ADMIN ACCOUNT DATA
GOOGLE AUTHENTICATION
EVENT ACTOR
USER INPUT
DECRYPTION KEY
USER INPUT
Firebase Real-Time Database
ADMIN ACCOUNT DATA
GOOGLE AUTHENTICATION
EVENT ACTOR ADMIN
EVENT ACTOR TAMPER
EMERGENCY SIGNAL LOG
HEARTBEAT LOG
QR Code Validity
LOCKER STATES
QR Code Scan
DATA
USER INPUT
Locker
EMERGENCY SIGNAL
HEATBEAT LOG
MQTT COMMAND
MQTT RESPONSE
5V 3A DC
5V 3A DC
Tablet
LOCKER STATES
EMERGENCY SIGNAL LOG
EVENT ACTOR
EMERGENCY SIGNAL
QR Code Validity
HEARTBEAT LOG
HEATBEAT LOG
MQTT COMMAND
MQTT RESPONSE
5V
5V 3A DC
QR Code
5V 3A DC


Admin Dashboard
USER INPUT
DASHBOARD
ADMIN ACCOUNT DATA
RESTRICTED DASHBOARD ACCESS
RESTRICTED DASHBOARD ACCESS
ADMIN ACCOUNT
USER INPUT
RESTRICTED DASHBOARD ACCESS
DECRYPTION KEY
DECRYPTION KEY
ACCOUNT DATA
ADMIN ACCOUNT DATA
GOOGLE AUTHENTICATION
GOOGLE AUTHENTICATION
GOOGLE AUTHENTICATION
EVENT ACTOR
DECRYPTION KEY


DASHBOARD
RESTRICTED DASHBOARD ACCESS
ADMIN ACCOUNT
DECRYPTION KEY
ACCOUNT DATA
GOOGLE AUTHENTICATION


Firebase Real-Time Database
ADMIN ACCOUNT DATA
GOOGLE AUTHENTICATION
EVENT ACTOR ADMIN
EVENT ACTOR TAMPER
EMERGENCY SIGNAL LOG
HEARTBEAT LOG
QR Code Validity
LOCKER STATES
INDEXES
BOOKING EVENTS
EVENT ACTOR ADMIN
ADMIN ACTOR
EVENT ACTOR TAMPER
TAMPER ACTOR
UNLOCK REQUESTS
PROFILE LIST
ADMIN ACCOUNT DATA
ADMIN ACCOUNT DATA
GOOGLE AUTHENTICATION
ROLE/STATUS/SECTOR ID
BOOKINGS
SECTOR LIST
QR Code Scan
QR TOKENS
QR Code Validity
QR Code Validity
QR Code Scan
QR Code Scan
LOCKER LIST
EMERGENCY SIGNAL LOG
EMERGENCY SIGNAL LOG
HEARTBEAT LOG
HEARTBEAT LOG
LOCKER STATES
LOCKER STATES
DATA

BOOKING EVENTS

ADMIN ACTOR

TAMPER ACTOR

BOOKINGS

INDEXES

LOCKER LIST

- EMERGENCY SIGNAL LOG
- HEARTBEAT LOG
- LOCKER STATES

PROFILE LIST

ADMIN ACCOUNT DATA

ROLE/STATUS/SECTOR ID

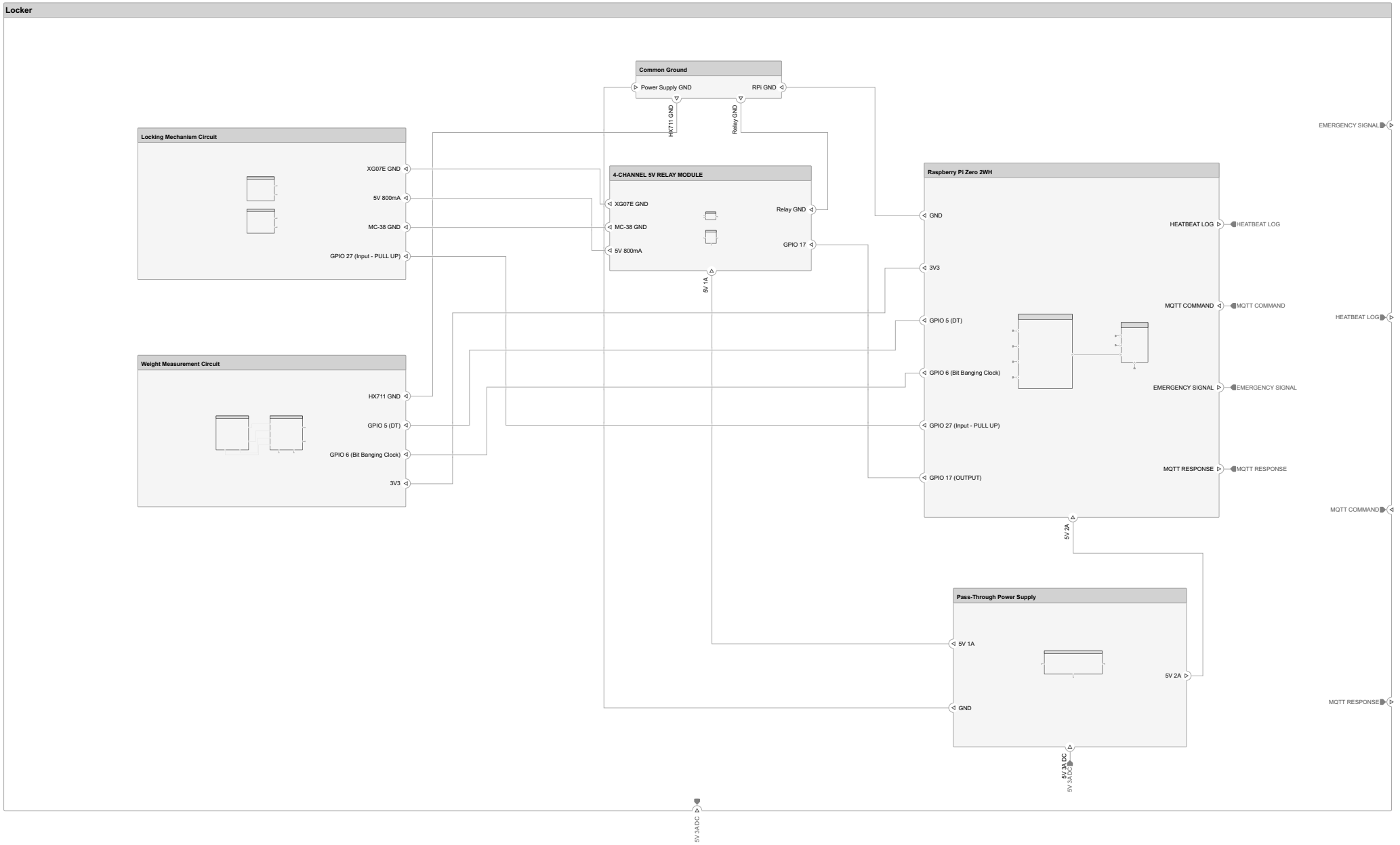
QR TOKENS

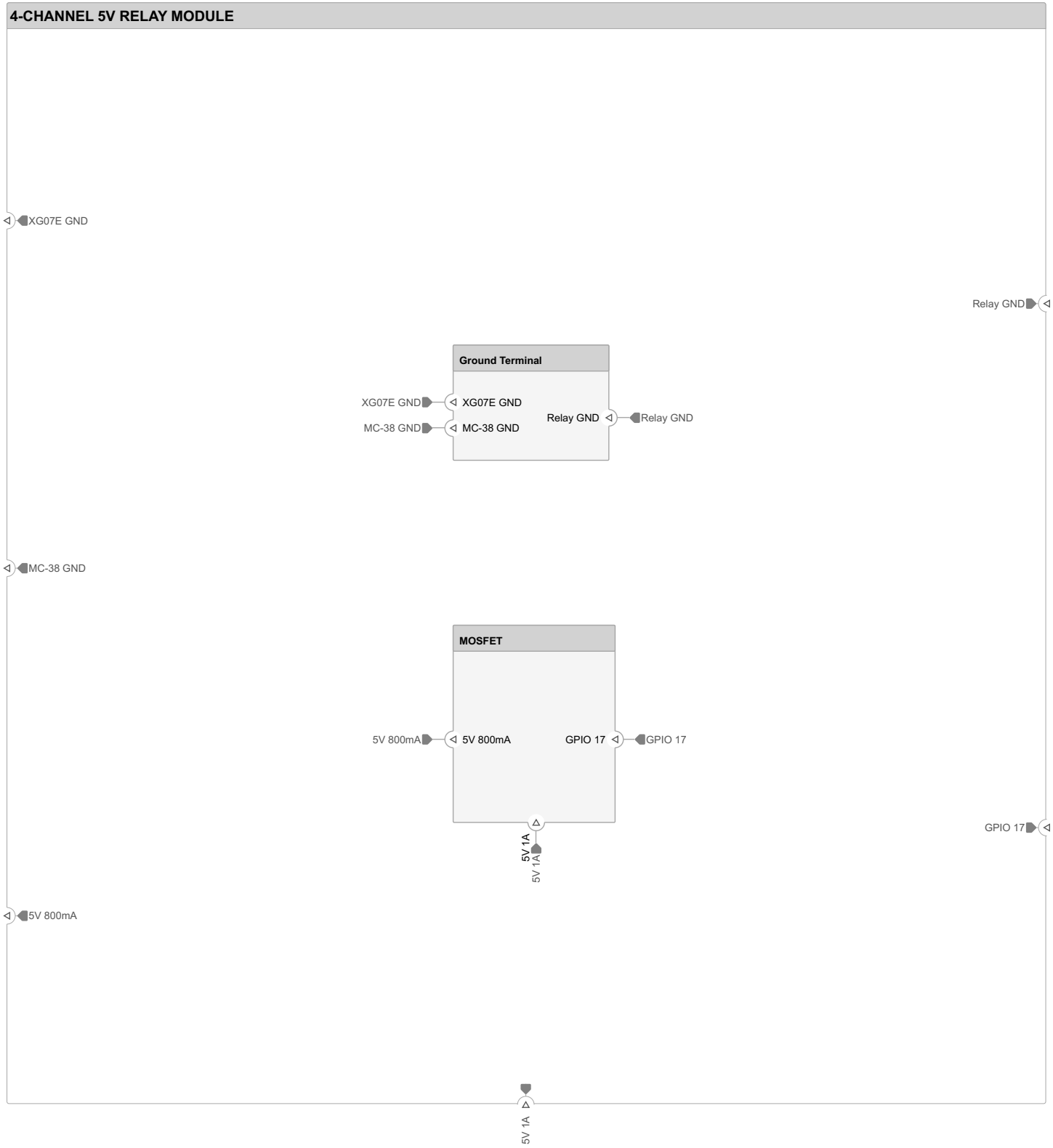
QR Code Validity

QR Code Scan

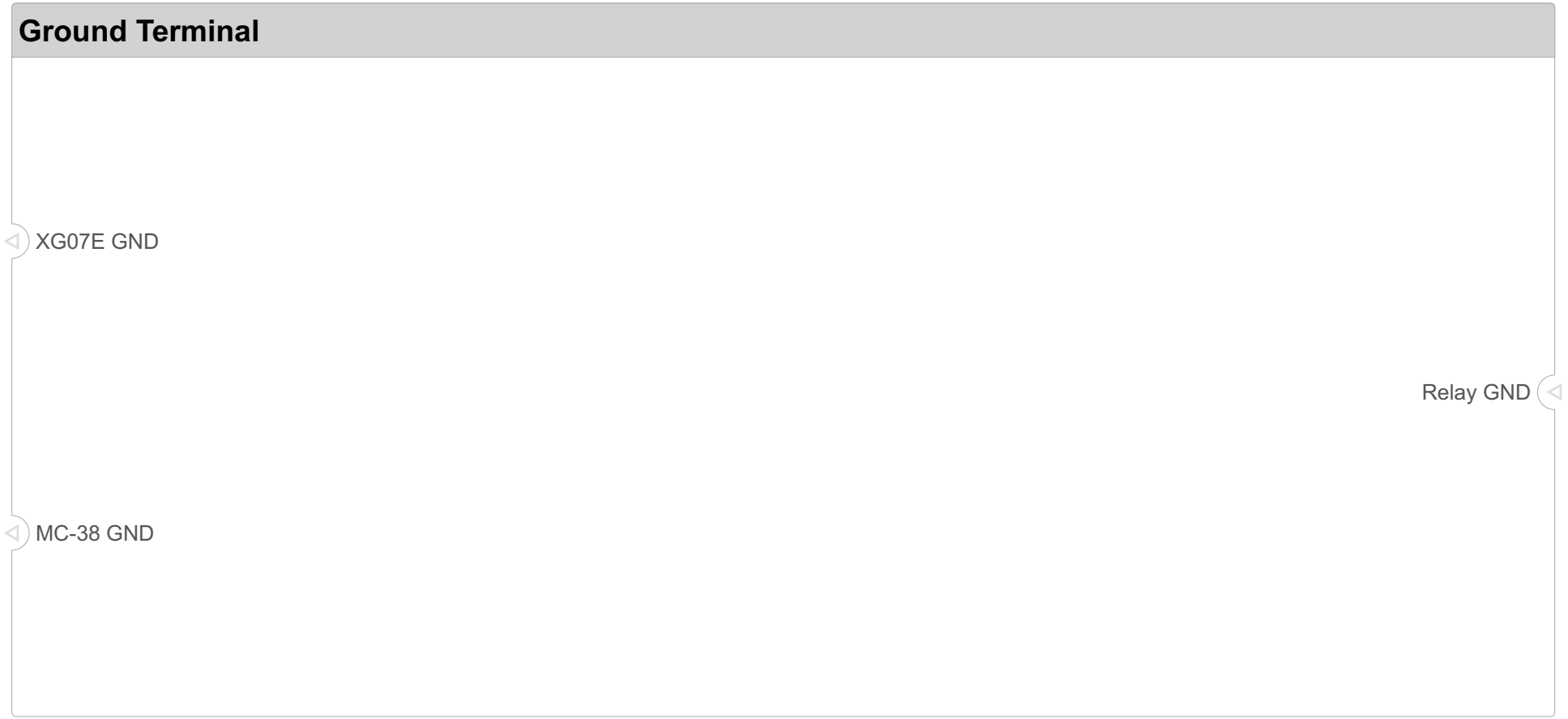
SECTOR LIST

UNLOCK REQUESTS

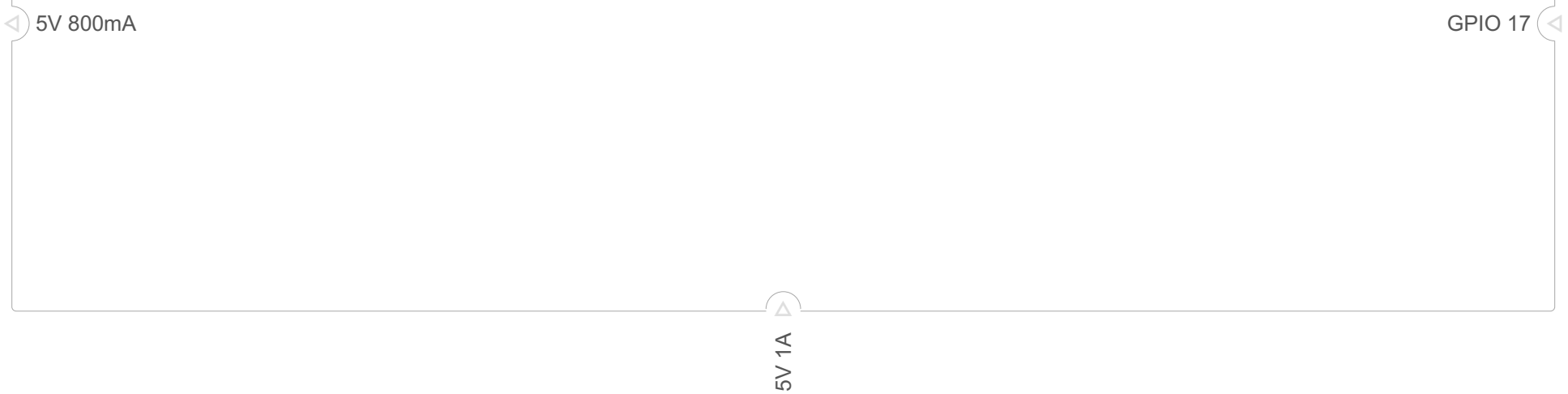

Locker
Common Ground
Power Supply GND
RPi GND
HX711 GND
Relay GND
Locking Mechanism Circuit
XG07E GND
5V 800mA
MC-38 GND
GPIO 27 (Input - PULL UP)
4-CHANNEL 5V RELAY MODULE
XG07E GND
MC-38 GND
5V 800mA
Relay GND
GPIO 17
5V 1A
Raspberry Pi Zero 2WH
GND
3V3
GPIO 5 (DT)
GPIO 6 (Bit Banging Clock)
GPIO 27 (Input - PULL UP)
GPIO 17 (OUTPUT)
HEATBEAT LOG
MQTT COMMAND
EMERGENCY SIGNAL
MQTT RESPONSE
5V 2A
Weight Measurement Circuit
HX711 GND
GPIO 5 (DT)
GPIO 6 (Bit Banging Clock)
3V3
Pass-Through Power Supply
5V 1A
GND
5V 2A
5V 3A DC
EMERGENCY SIGNAL
HEATBEAT LOG
MQTT COMMAND
MQTT RESPONSE
5V 3A DC

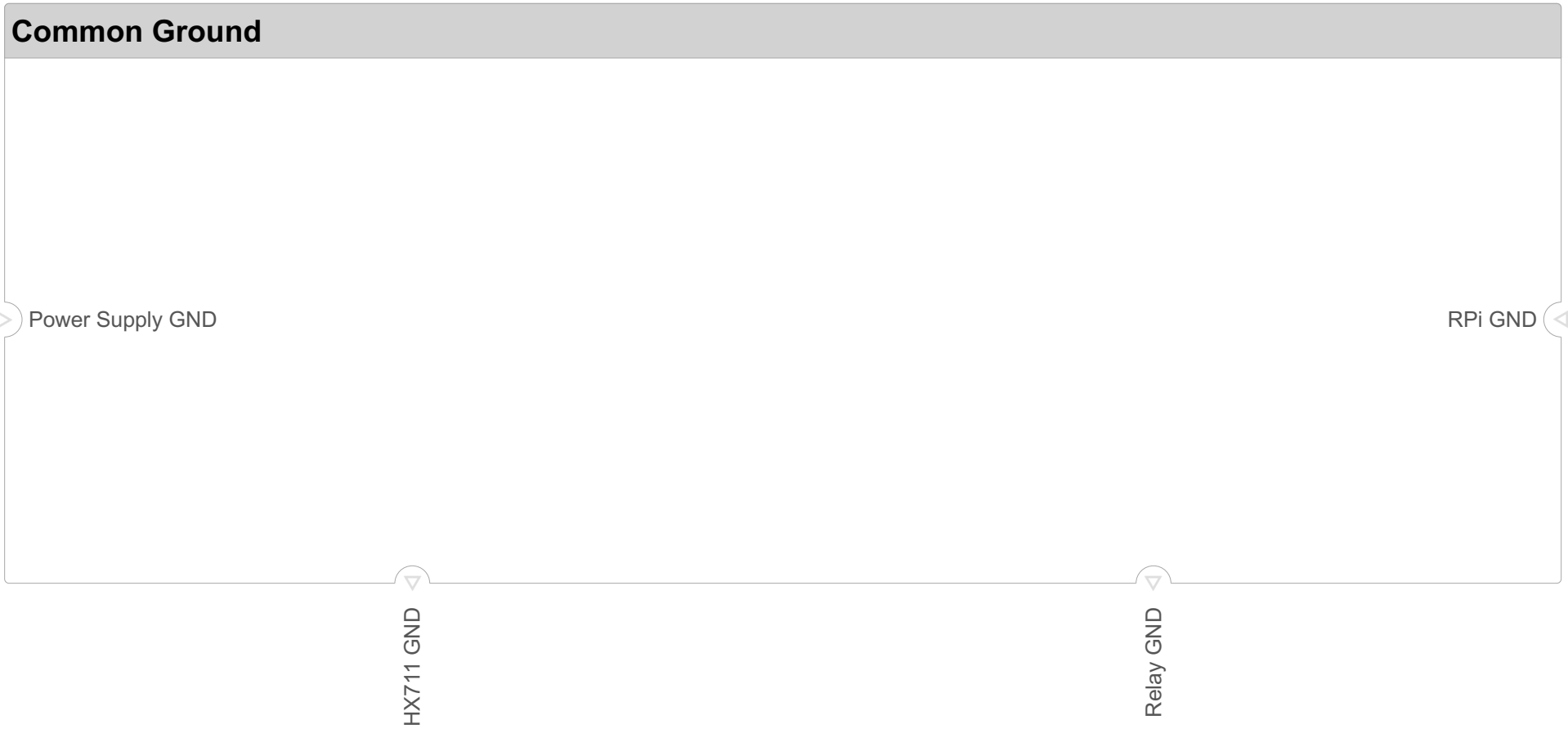

4-CHANNEL 5V RELAY MODULE
XG07E GND
Relay GND
Ground Terminal
XG07E GND
XG07E GND
MC-38 GND
MC-38 GND
Relay GND
Relay GND
MC-38 GND
MOSFET
5V 800mA
5V 800mA
GPIO 17
GPIO 17
5V 1A
5V 1A
5V 800mA
5V 1A
5V 1A

Ground Terminal



MOSFET




Common Ground
Power Supply GND
RPi GND
HX711 GND
Relay GND

Locking Mechanism Circuit

XG07E GND

SARY XG07E LOCK

XG07E GND — XG07E GND

5V 800mA — 5V 800mA

5V 800mA

MC-38 Reed Switch

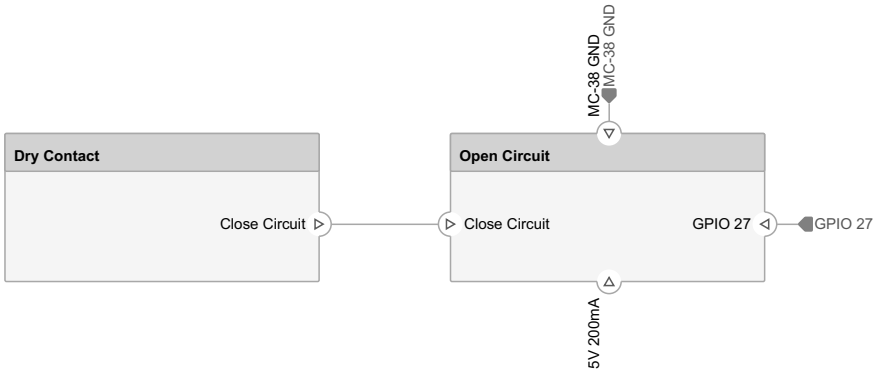
MC-38 GND — MC-38 GND

GPIO 27 — GPIO 27 (Input - PULL UP)

MC-38 GND

GPIO 27 (Input - PULL UP)

MC-38 Reed Switch

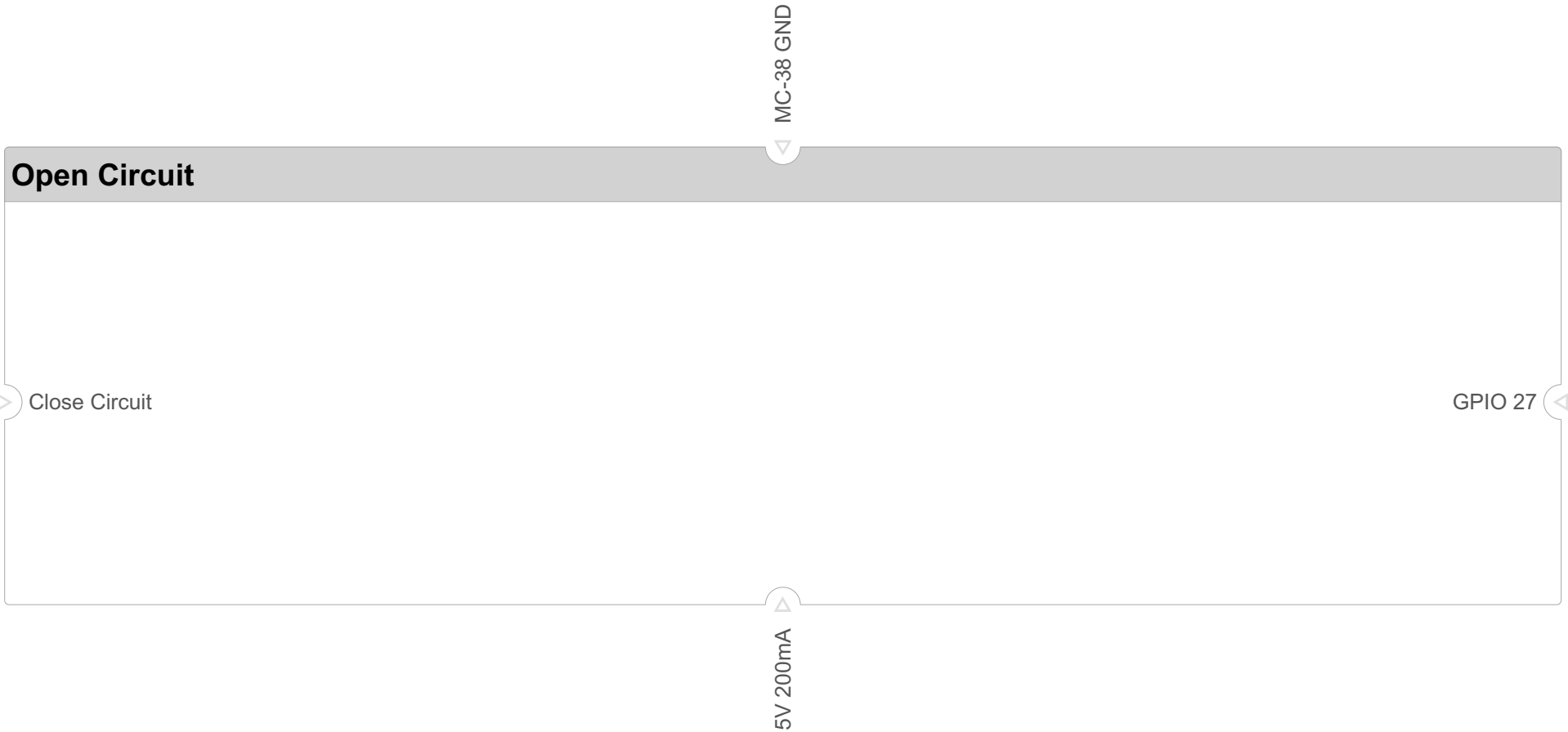


MC-38 GND

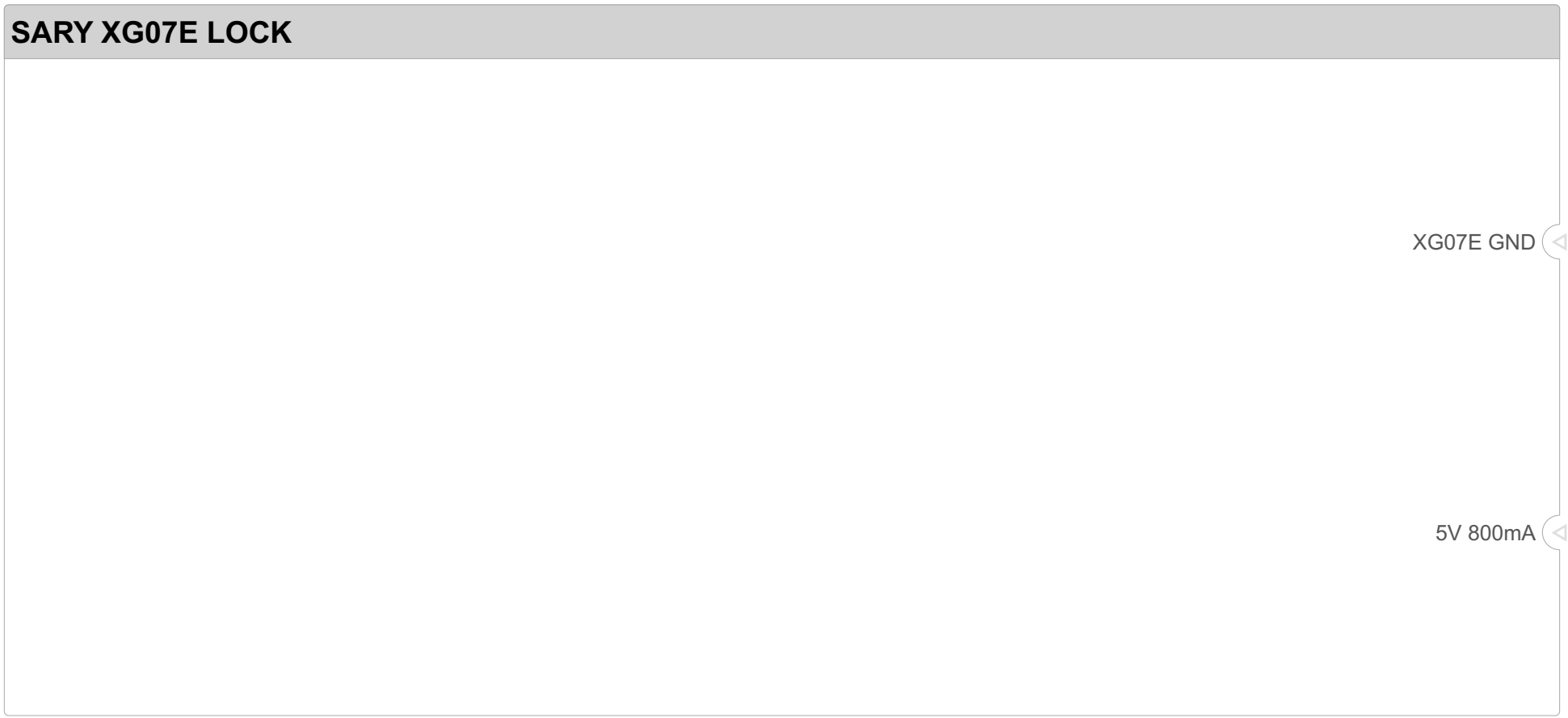
GPIO 27

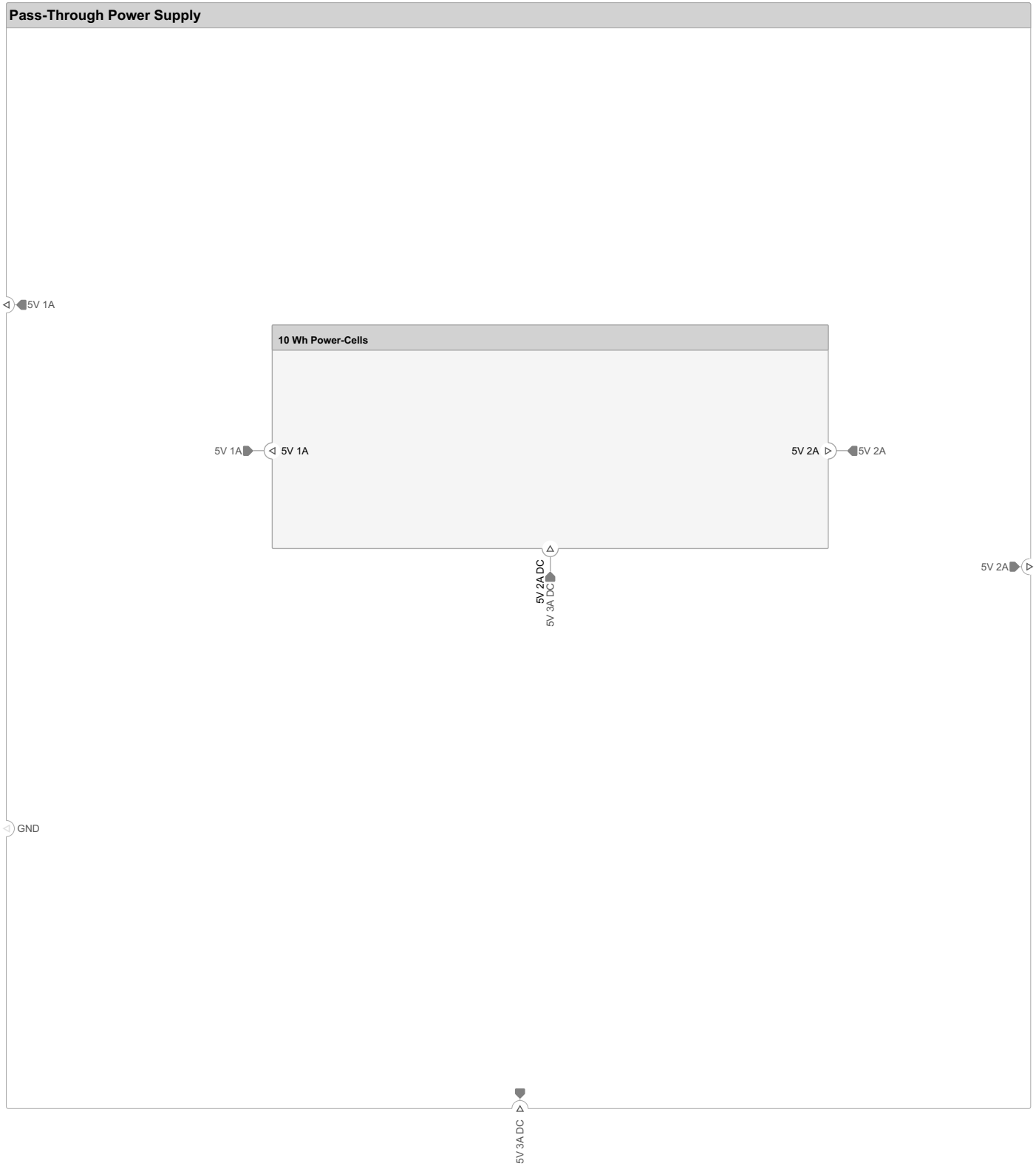
Dry Contact

Close Circuit

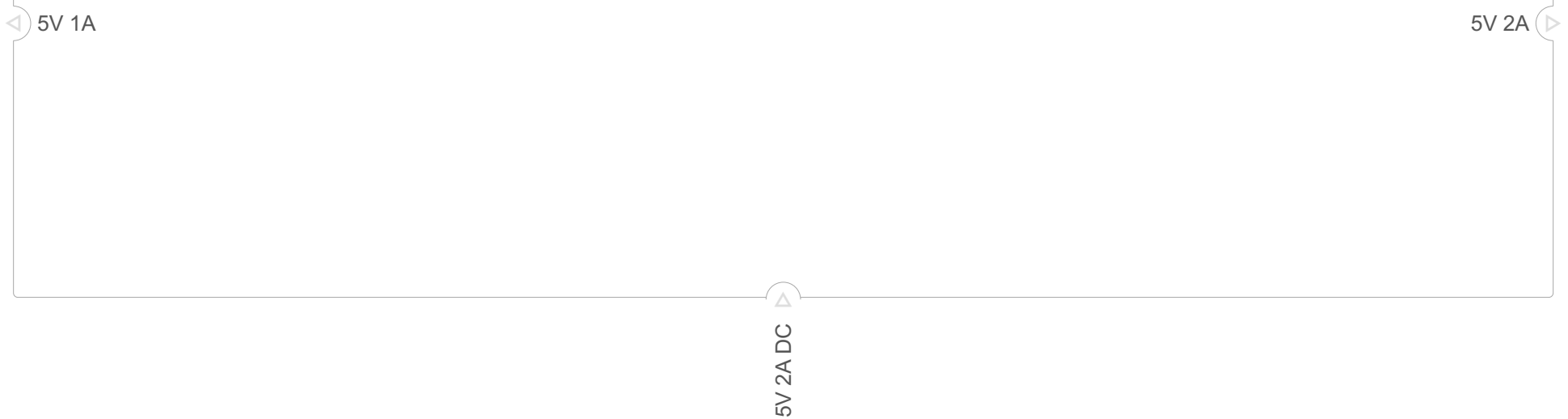

MC-38 GND
Open Circuit
Close Circuit
GPIO 27
5V 200mA

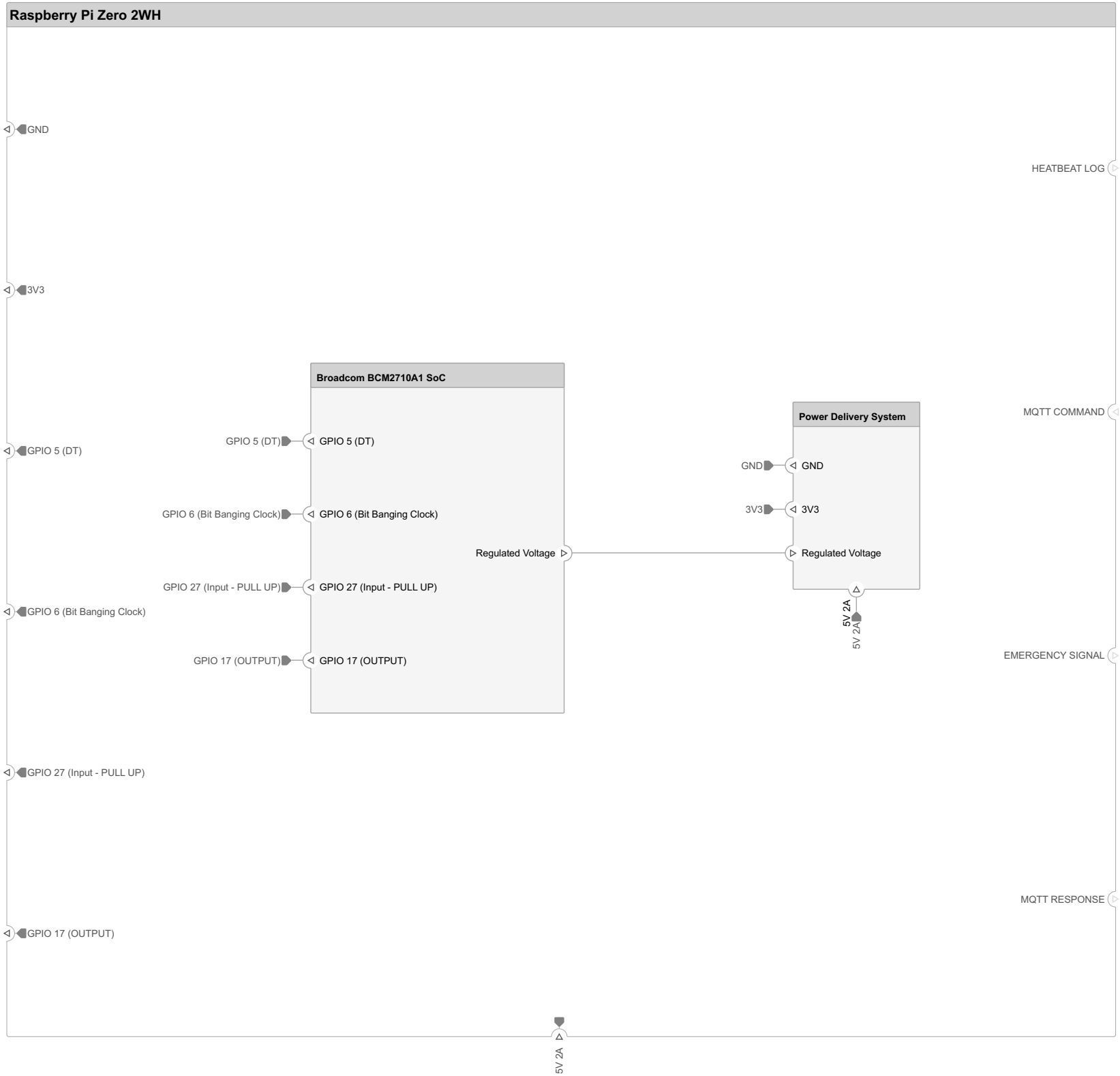
SARY XG07E LOCK

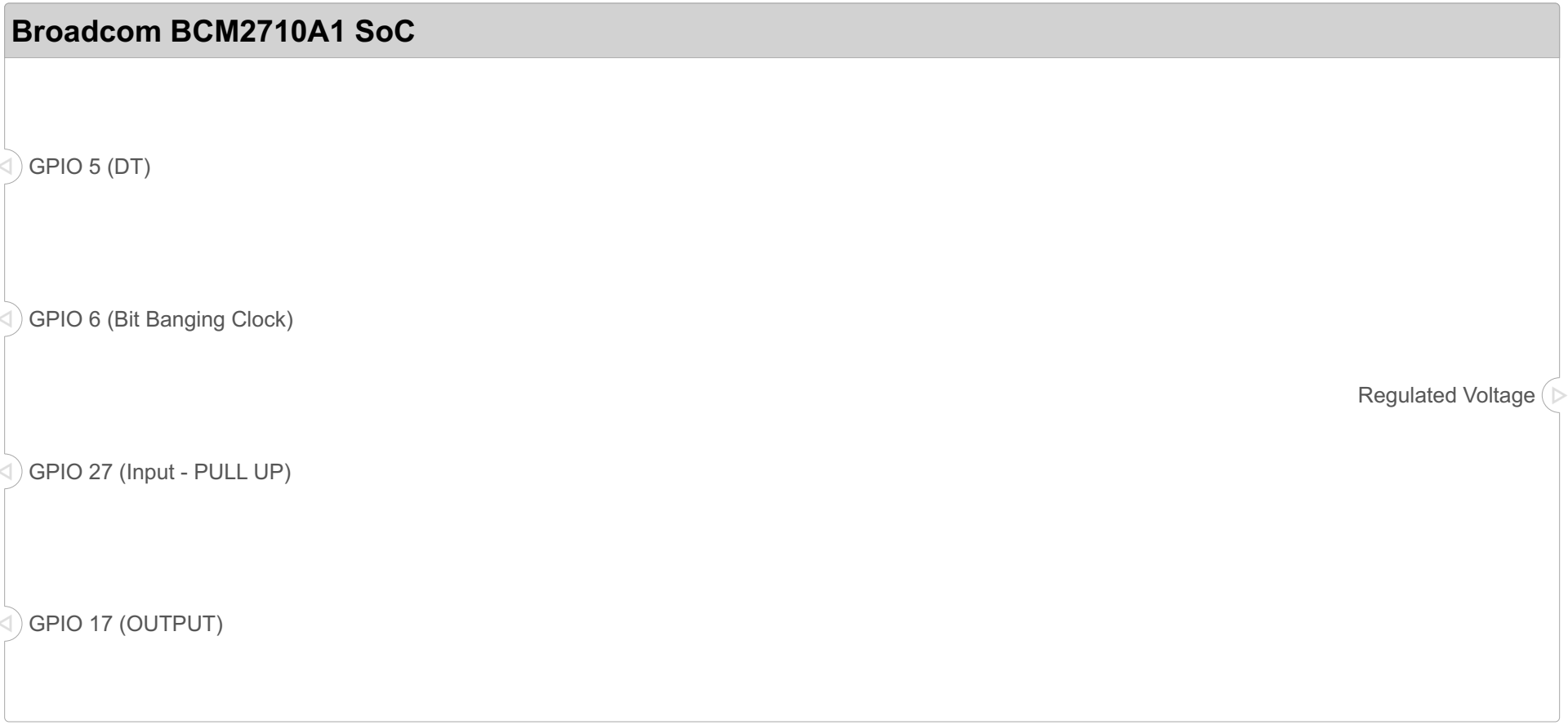



Pass-Through Power Supply
5V 1A
10 Wh Power-Cells
5V 1A
5V 1A
5V 2A
5V 2A
5V 2A DC
5V 3A DC
5V 2A
GND
5V 3A DC

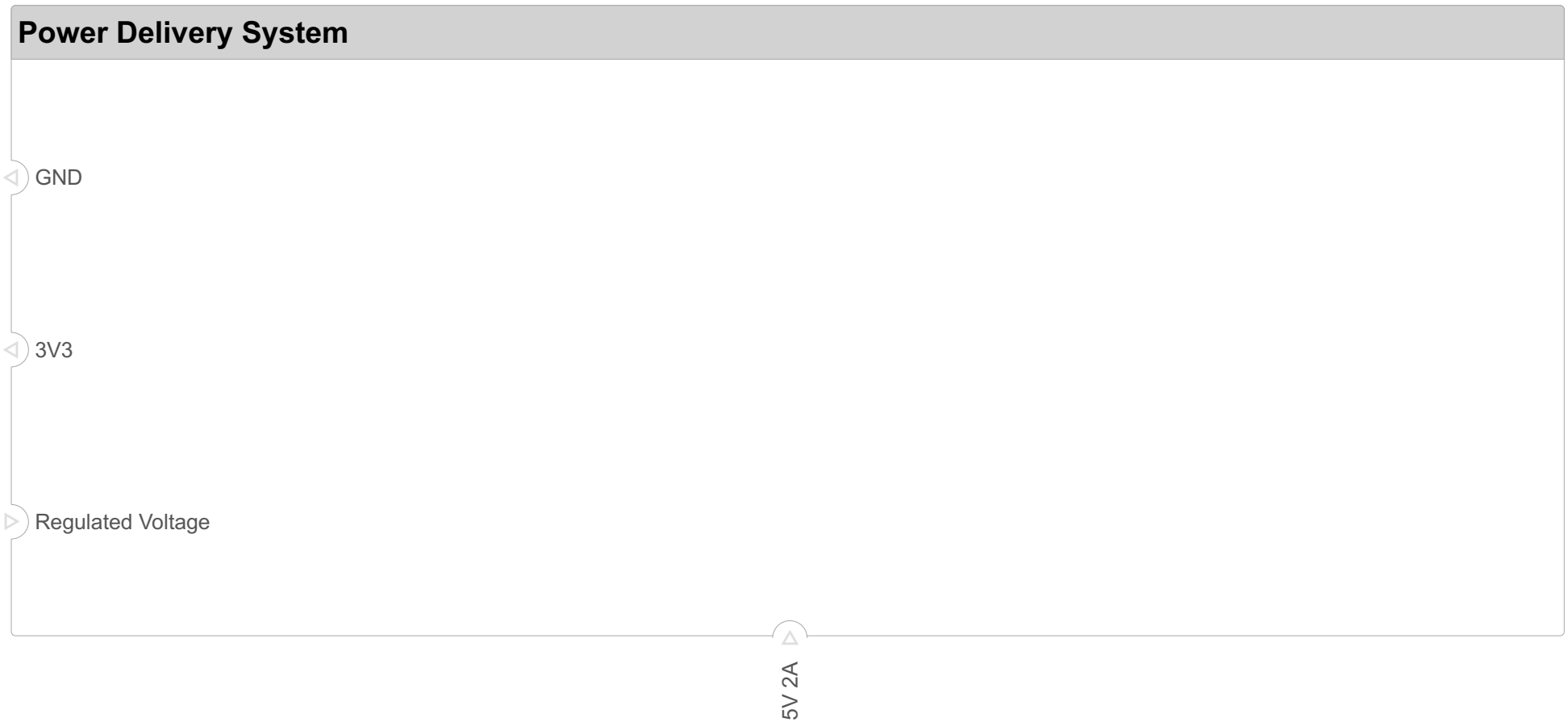
10 Wh Power-Cells



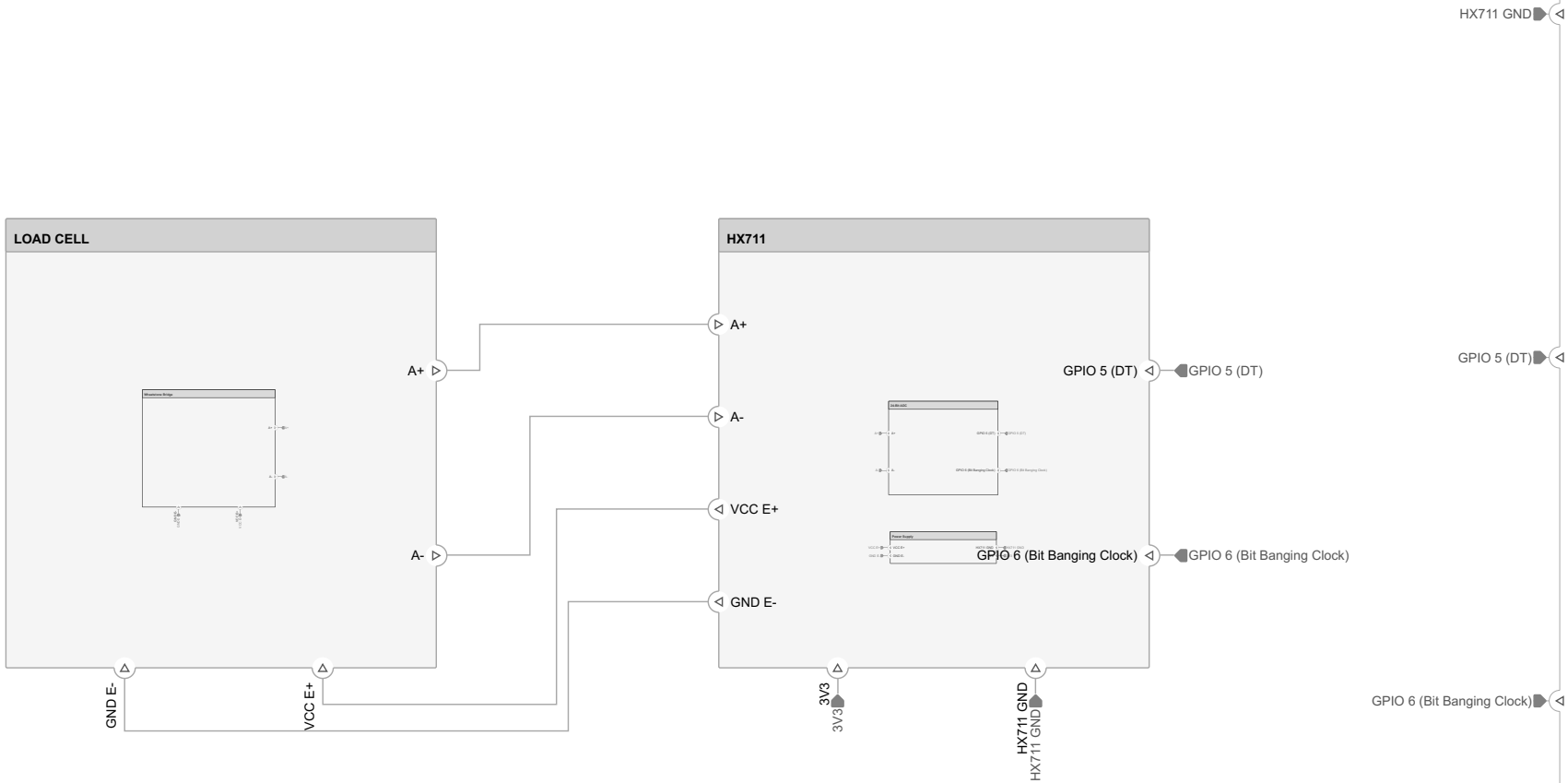

Raspberry Pi Zero 2WH
GND
3V3
GPIO 5 (DT)
GPIO 6 (Bit Banging Clock)
GPIO 27 (Input - PULL UP)
GPIO 17 (OUTPUT)
5V 2A
HEATBEAT LOG
MQTT COMMAND
EMERGENCY SIGNAL
MQTT RESPONSE
Broadcom BCM2710A1 SoC
GPIO 5 (DT)
GPIO 6 (Bit Banging Clock)
GPIO 27 (Input - PULL UP)
GPIO 17 (OUTPUT)
Regulated Voltage
Power Delivery System
GND
3V3
Regulated Voltage
5V 2A

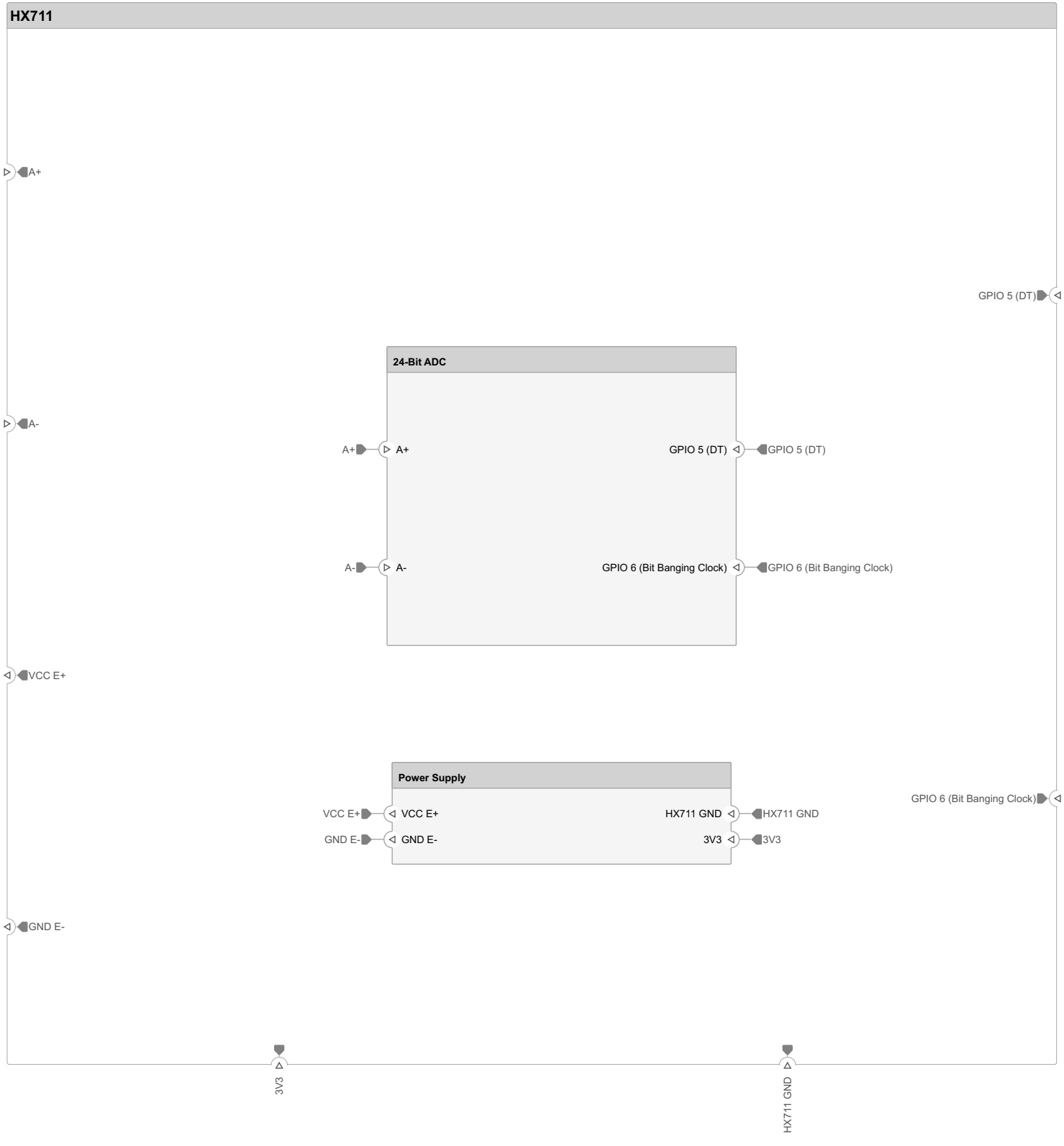

Broadcom BCM2710A1 SoC
GPIO 5 (DT)
GPIO 6 (Bit Banging Clock)
Regulated Voltage
GPIO 27 (Input - PULL UP)
GPIO 17 (OUTPUT)

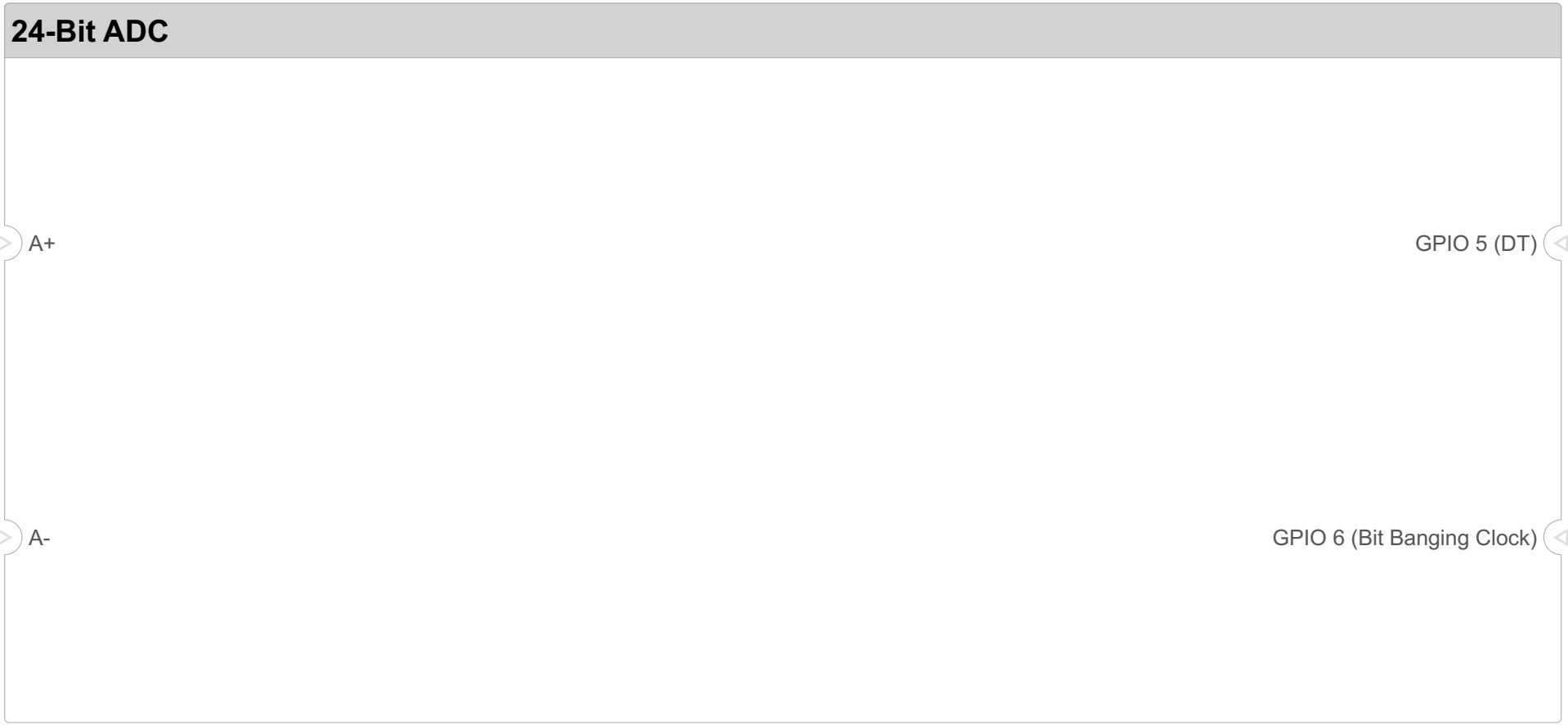
Power Delivery System



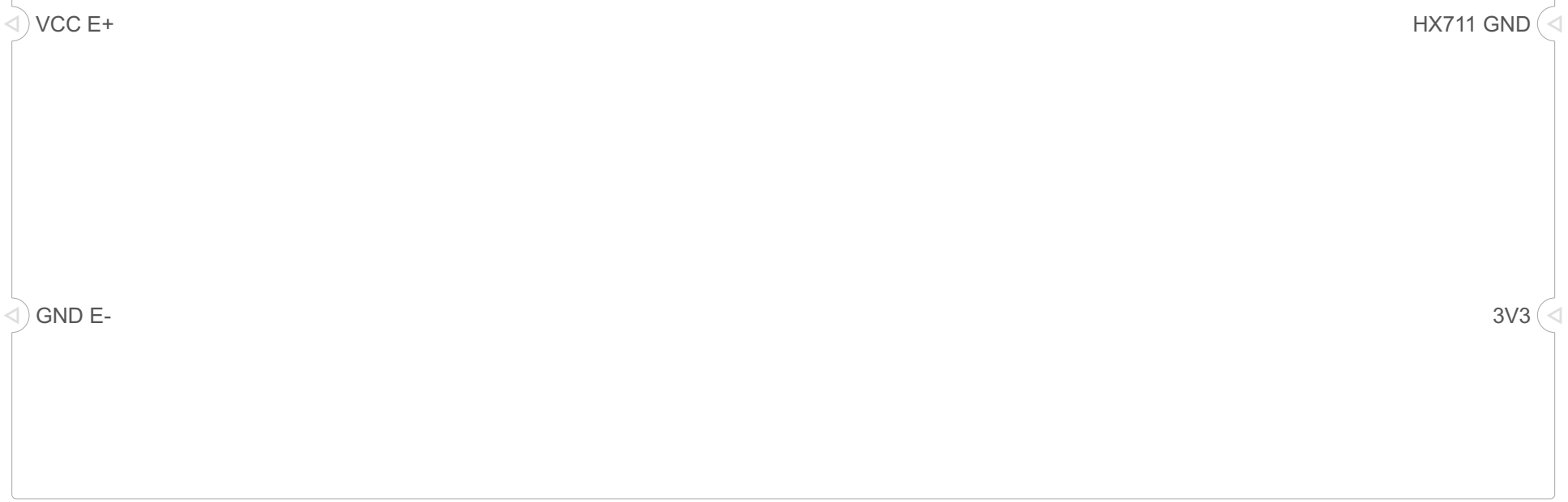
Weight Measurement Circuit

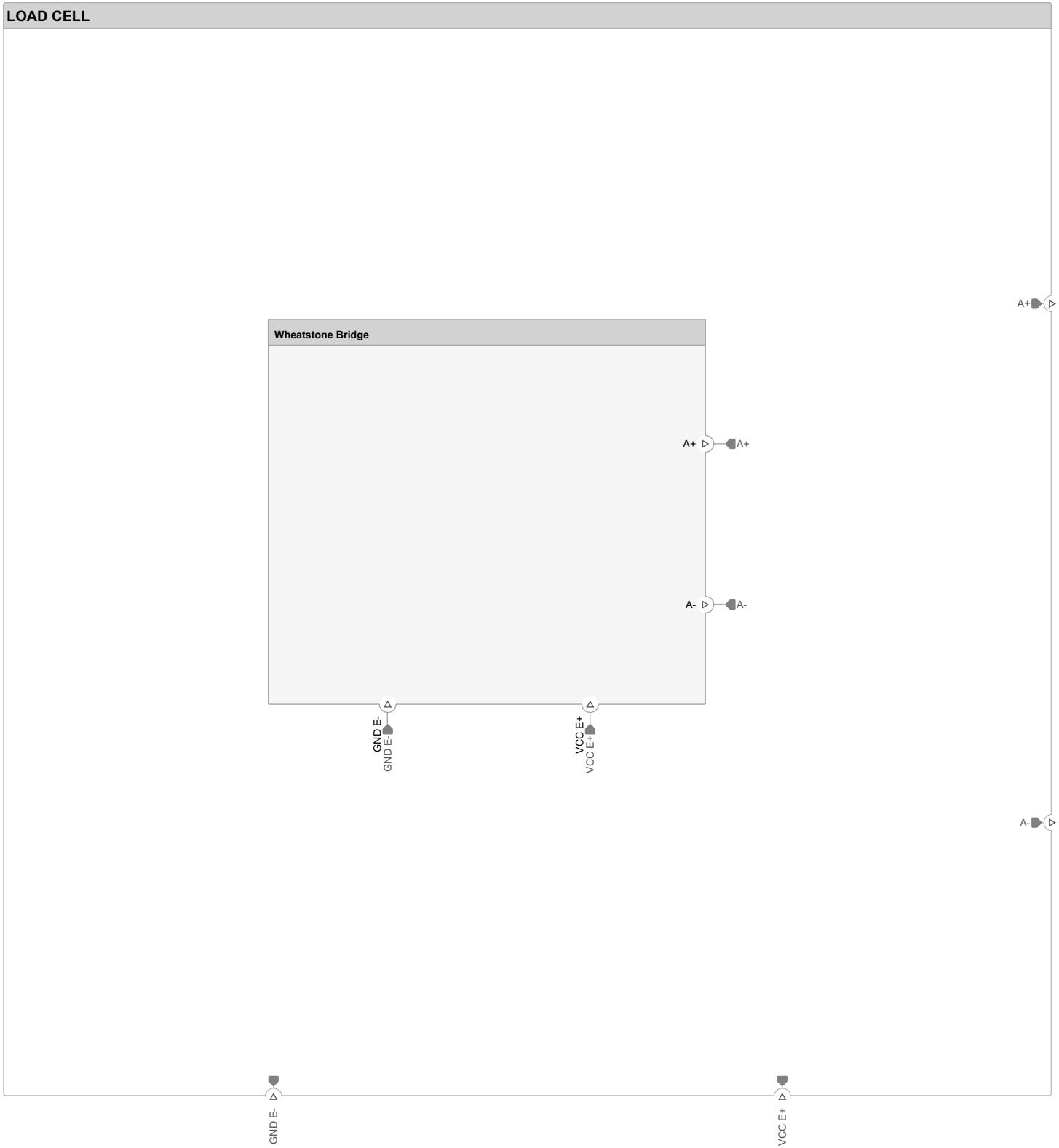



HX711
A+
A-
VCC E+
GND E-
3V3
HX711 GND
GPIO 5 (DT)
GPIO 6 (Bit Banging Clock)
24-Bit ADC
A+
A+
A-
A-
GPIO 5 (DT)
GPIO 5 (DT)
GPIO 6 (Bit Banging Clock)
GPIO 6 (Bit Banging Clock)
Power Supply
VCC E+
VCC E+
GND E-
GND E-
HX711 GND
HX711 GND
3V3
3V3

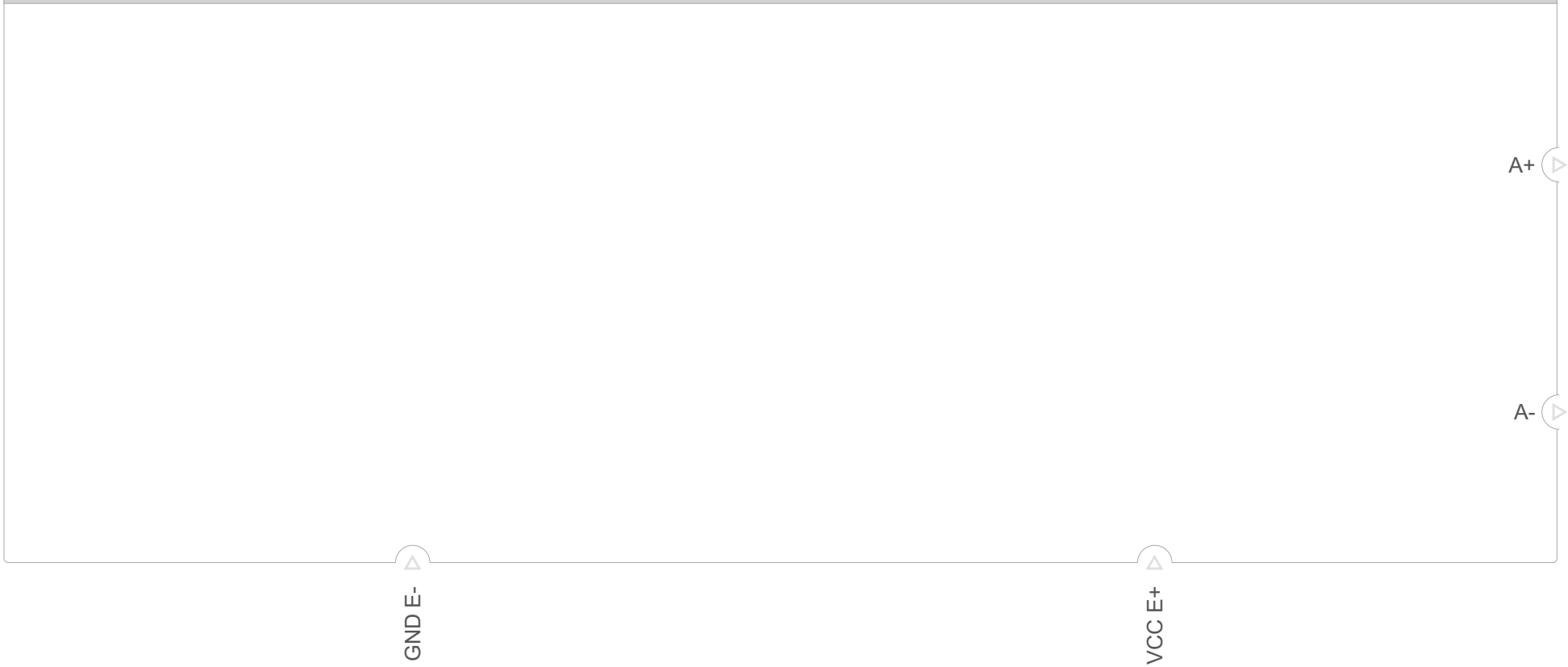

24-Bit ADC
A+
A-
GPIO 5 (DT)
GPIO 6 (Bit Banging Clock)

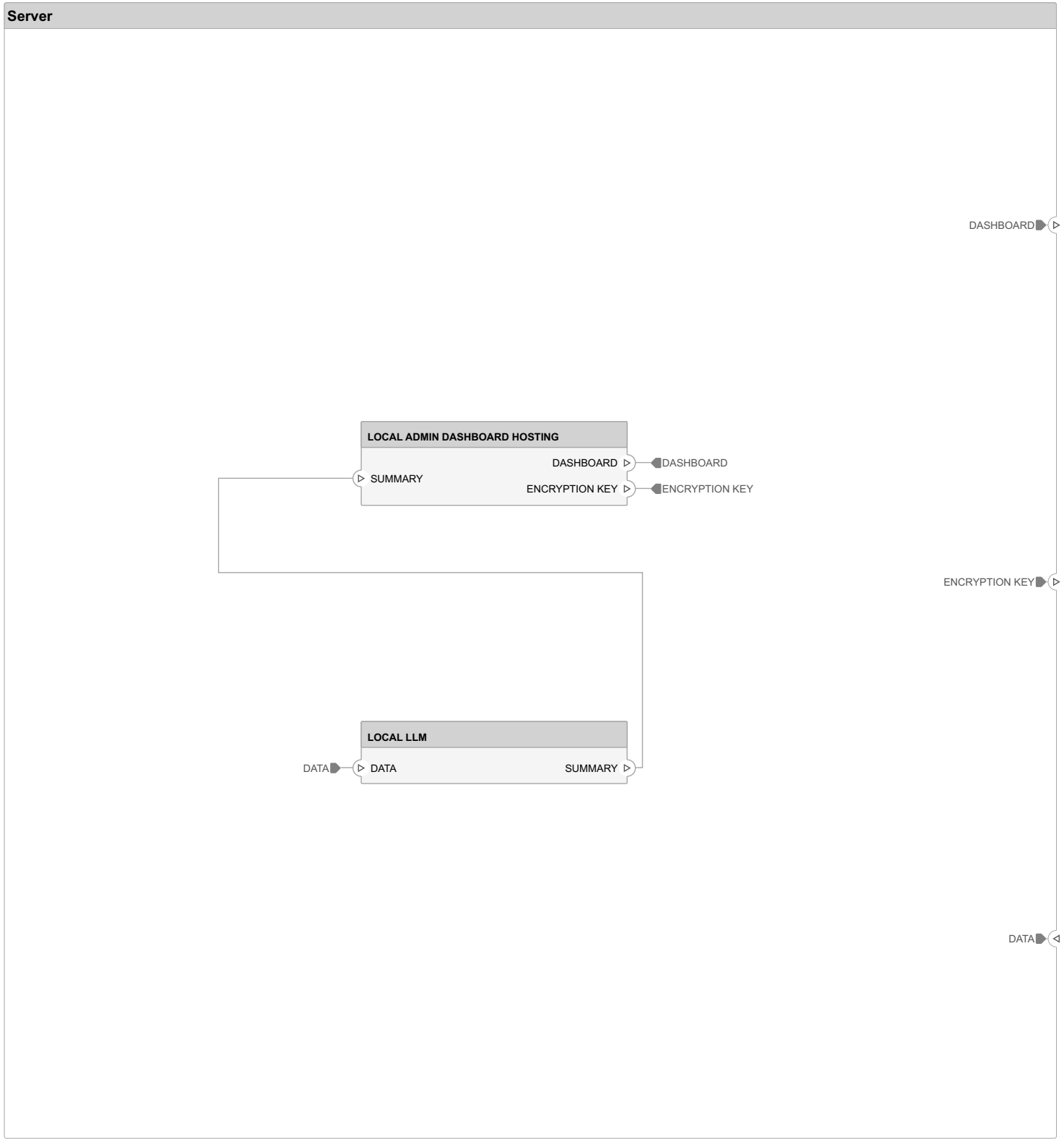
Power Supply




LOAD CELL
Wheatstone Bridge
A+
A-
GND E-
VCC E+
A+
A-
GND E-
VCC E+

Wheatstone Bridge




Server
DASHBOARD
LOCAL ADMIN DASHBOARD HOSTING
DASHBOARD
DASHBOARD
SUMMARY
ENCRYPTION KEY
ENCRYPTION KEY
ENCRYPTION KEY
LOCAL LLM
DATA
DATA
SUMMARY
DATA

LOCAL ADMIN DASHBOARD HOSTING

DASHBOARD

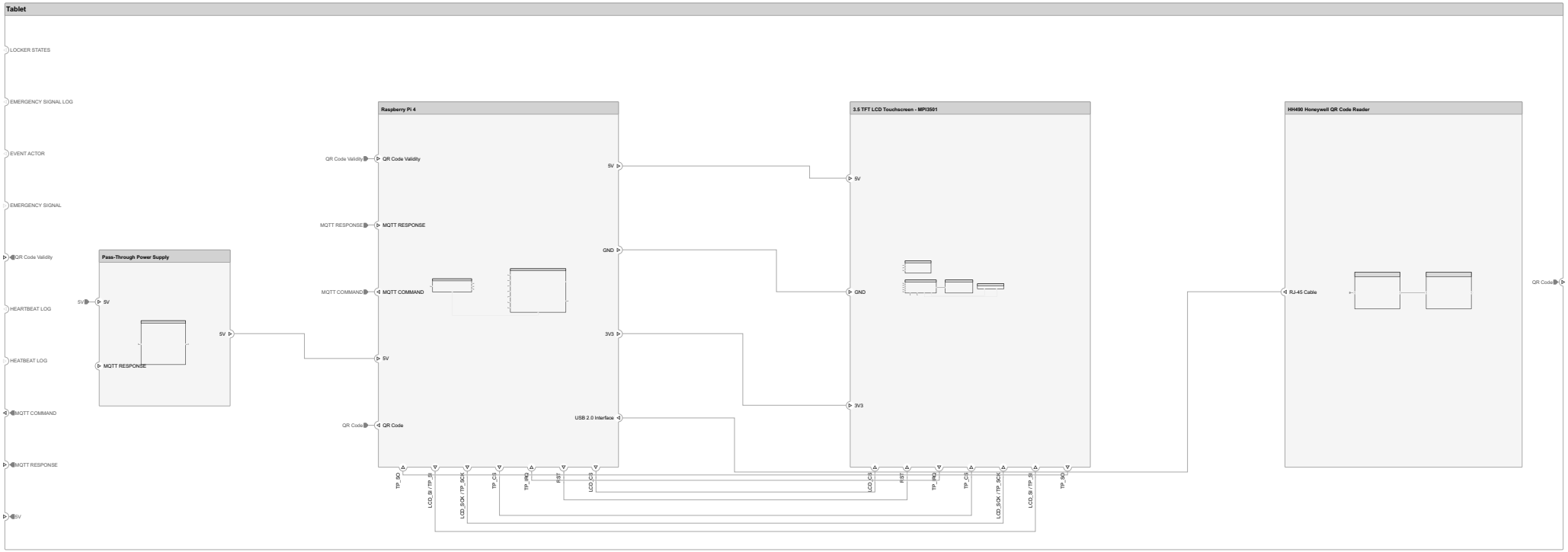
SUMMARY

ENCRYPTION KEY

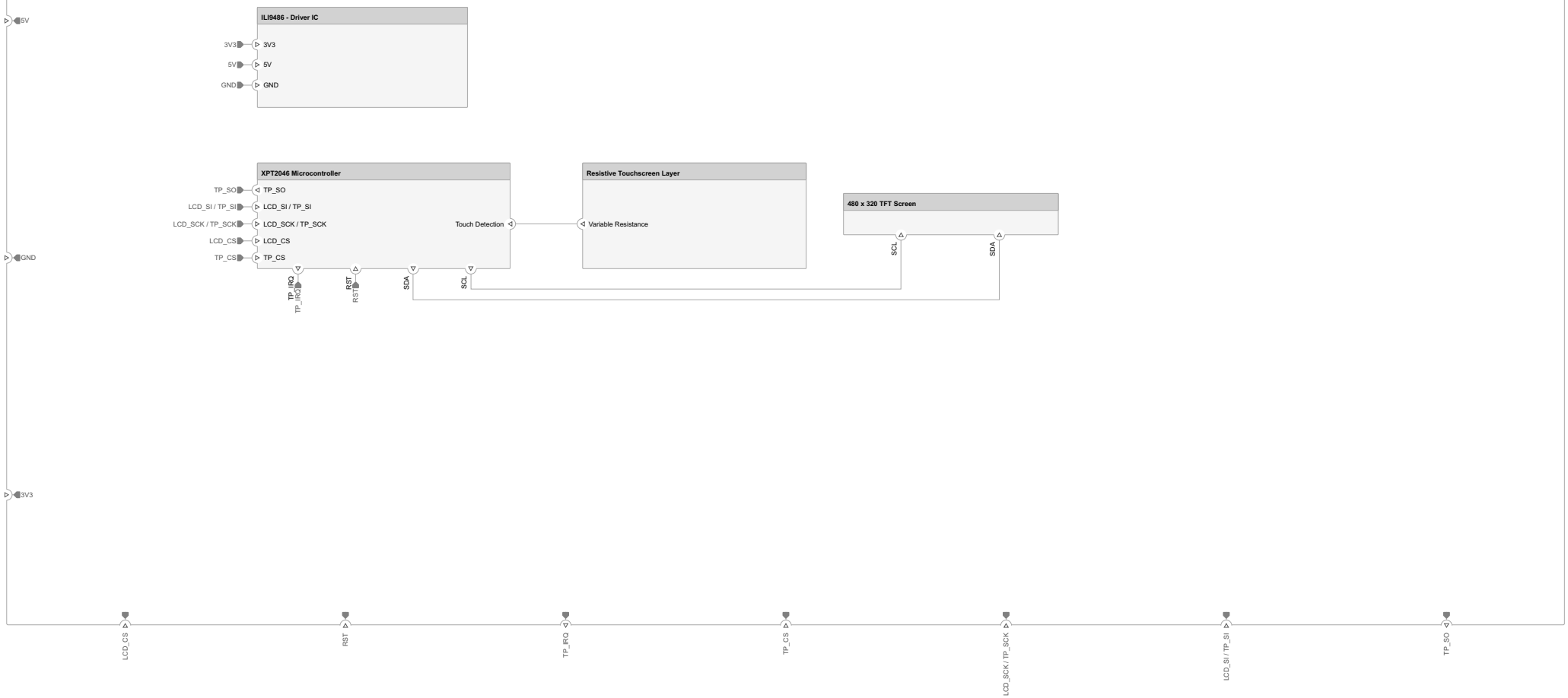
LOCAL LLM

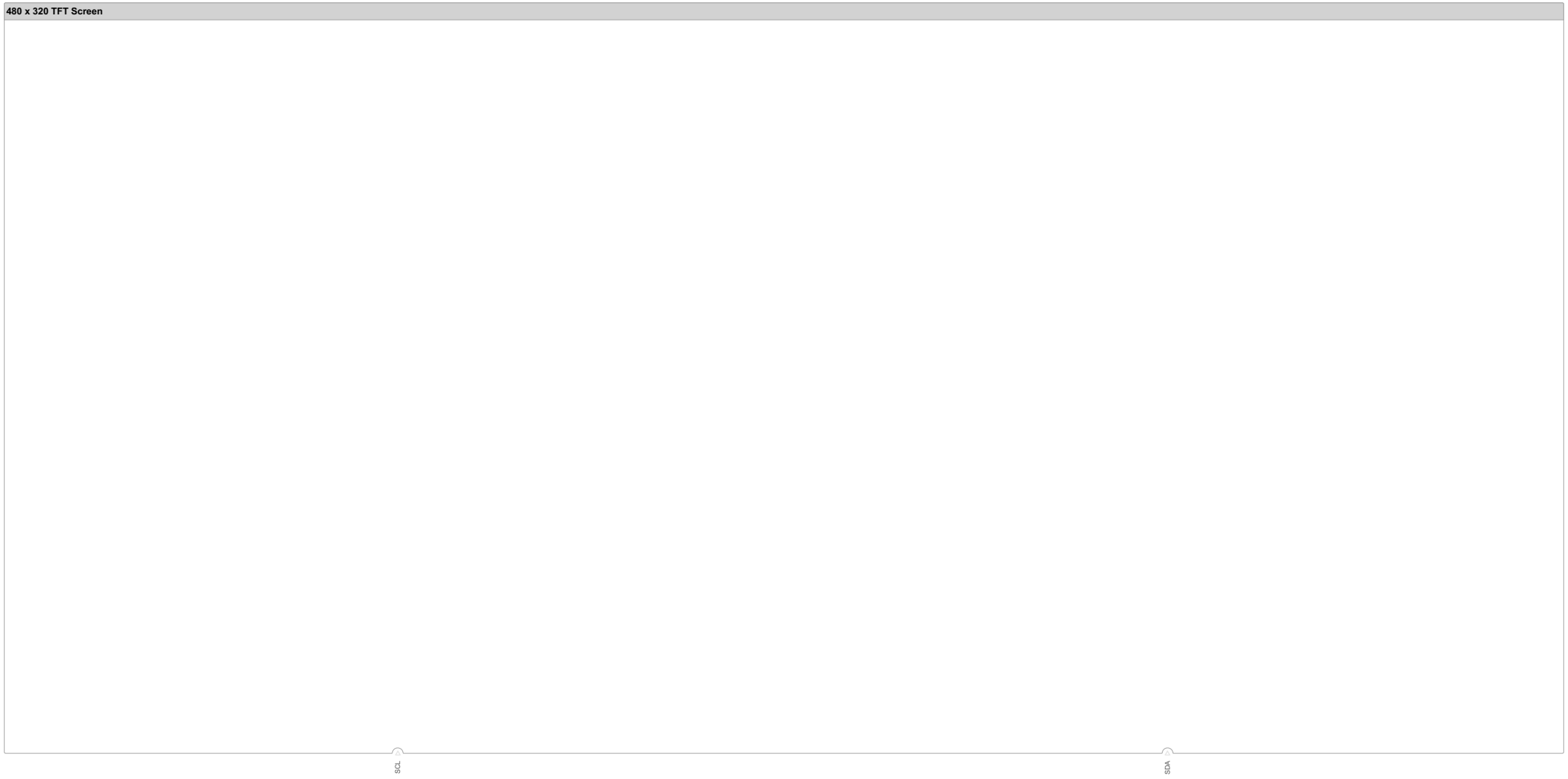
DATA

SUMMARY

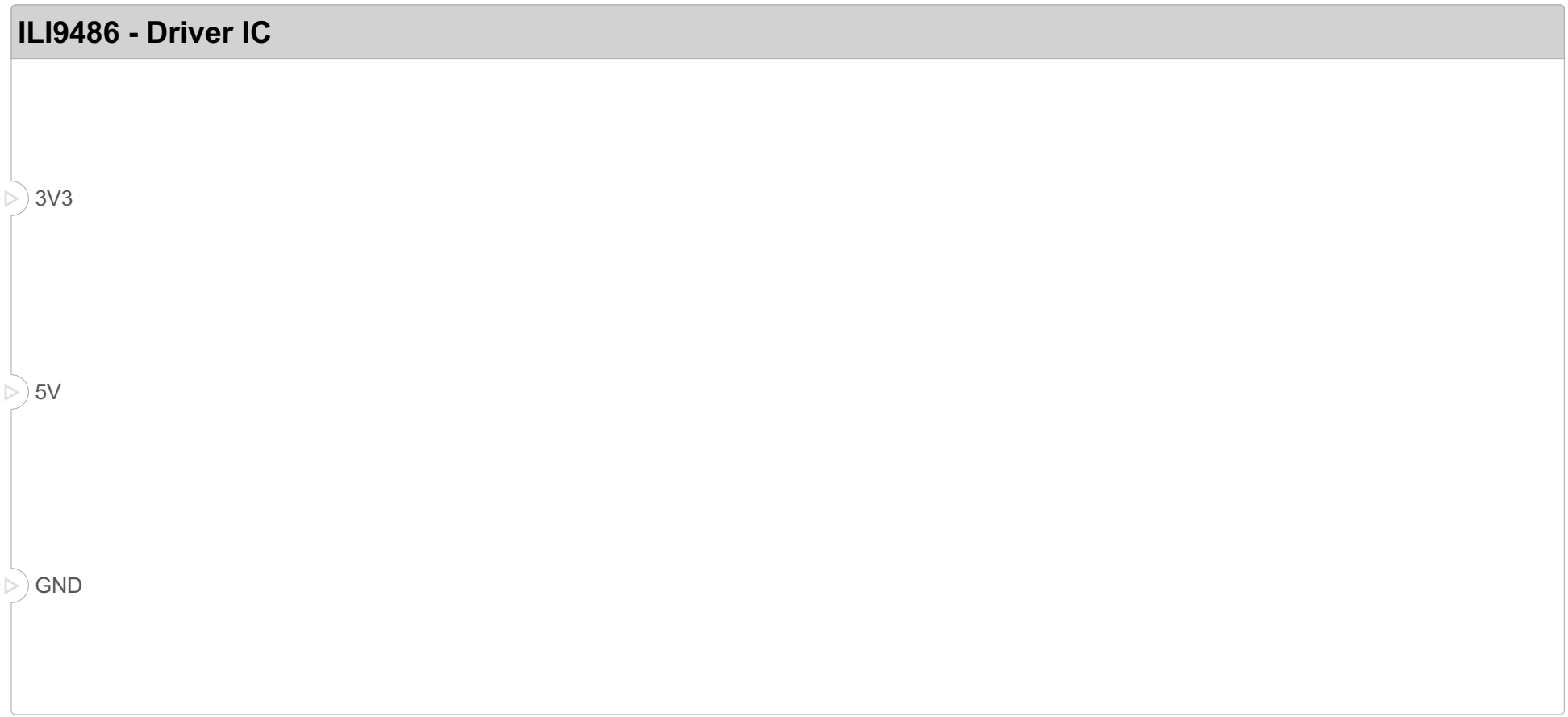

Tablet
LOCKER STATES
EMERGENCY SIGNAL LOG
EVENT ACTOR
EMERGENCY SIGNAL
QR Code Validity
HEARTBEAT LOG
HEATBEAT LOG
MQTT COMMAND
MQTT RESPONSE
5V
Pass-Through Power Supply
5V
5V
MQTT RESPONSE
Raspberry Pi 4
QR Code Validity
QR Code Validity
MQTT RESPONSE
MQTT RESPONSE
MQTT COMMAND
MQTT COMMAND
5V
QR Code
QR Code
5V
GND
3V3
USB 2.0 Interface
3.5 TFT LCD Touchscreen - MPI3501
5V
GND
3V3
TP_SCK
LCD_SI / TP_SI
LCD_SCK / TP_SCK
TP_CS
TP_IRQ
RST
LCD_CS
LCD_CS
RST
TP_IRQ
TP_CS
LCD_SCK / TP_SCK
LCD_SI / TP_SI
TP_SCK
HH490 Honeywell QR Code Reader
RJ-45 Cable
QR Code
5V

3.5 TFT LCD Touchscreen - MPI3501



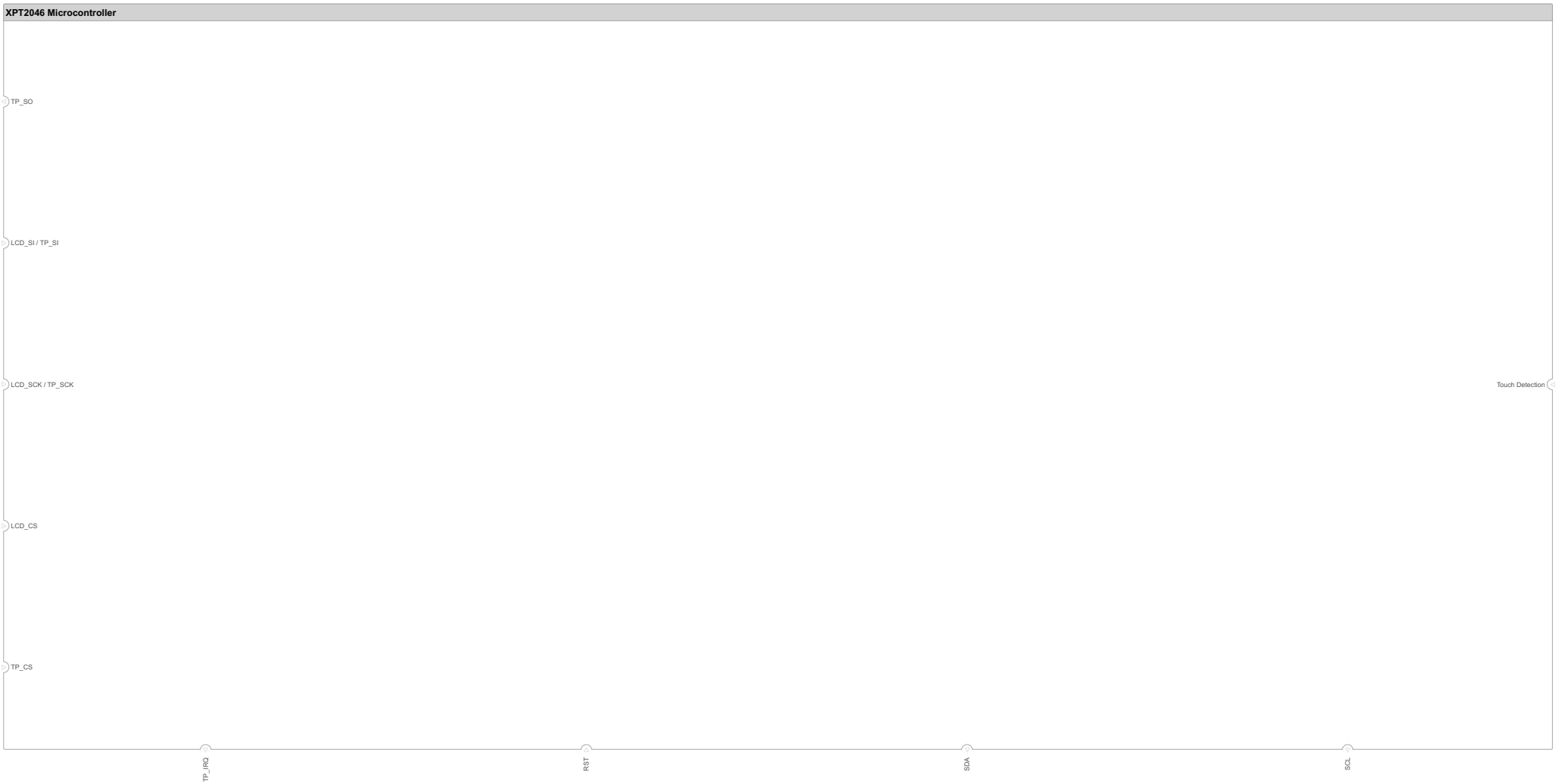

480 x 320 TFT Screen
SCL
SDA

ILI9486 - Driver IC

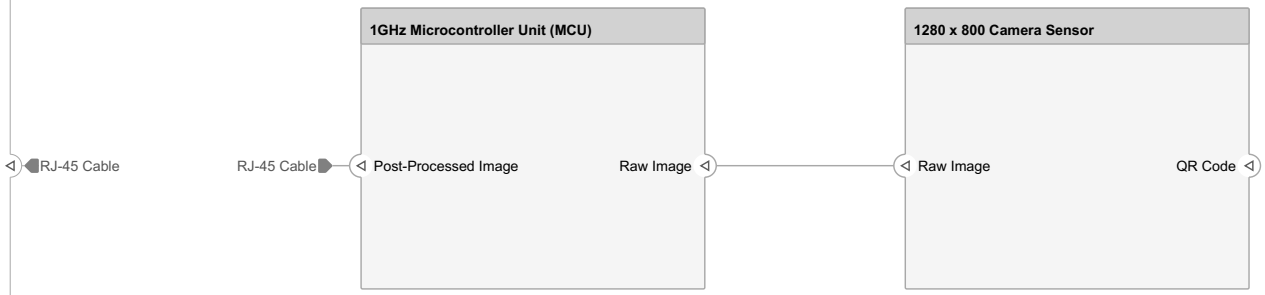


Resistive Touchscreen Layer

Variable Resistance


XPT2046 Microcontroller
TP_SO
LCD_SI / TP_SI
LCD_SCK / TP_SCK
LCD_CS
TP_CS
Touch Detection
TP_IRQ
RST
SDA
SCL

HH490 Honeywell QR Code Reader



1280 x 800 Camera Sensor

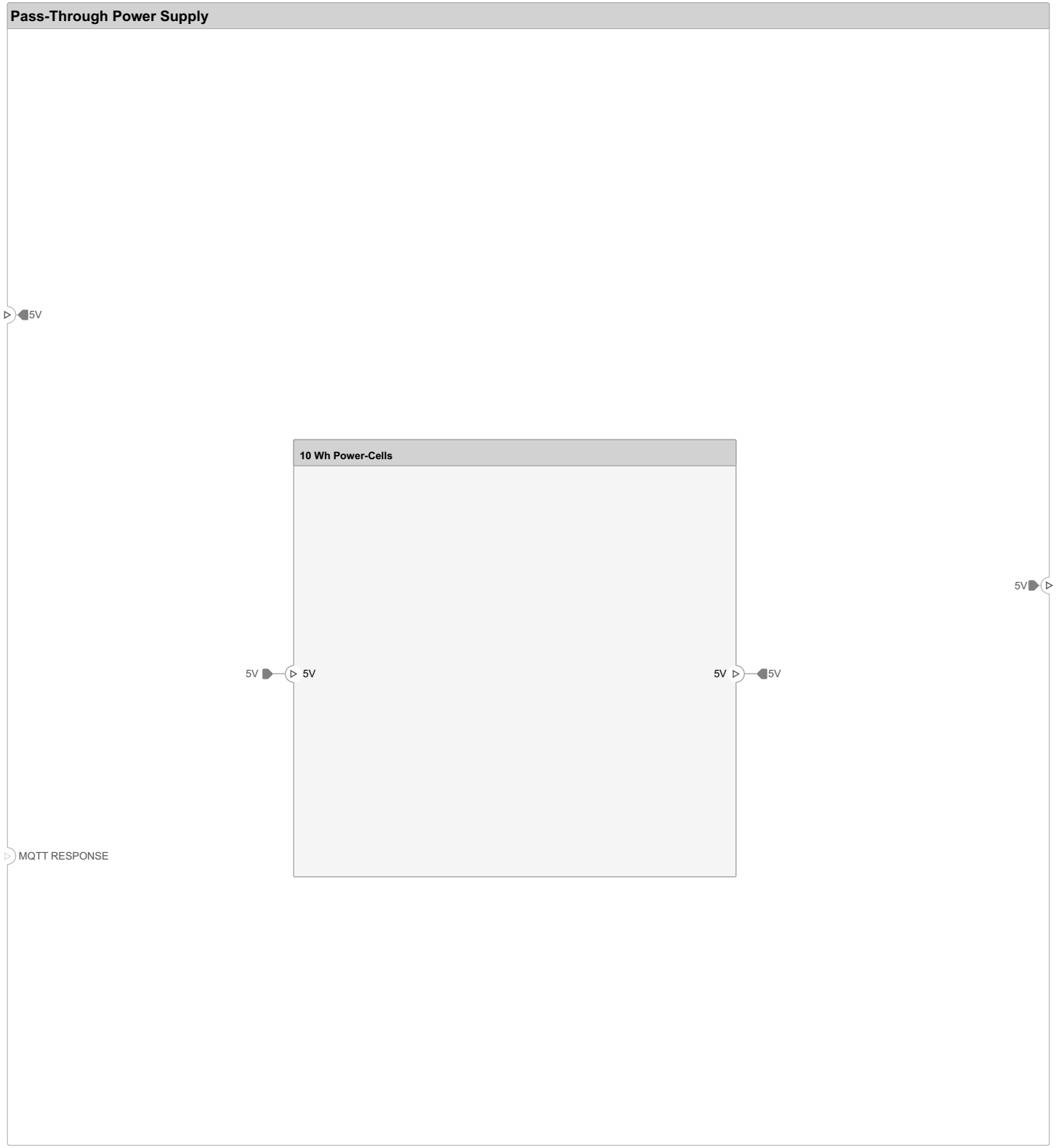
Raw Image

QR Code

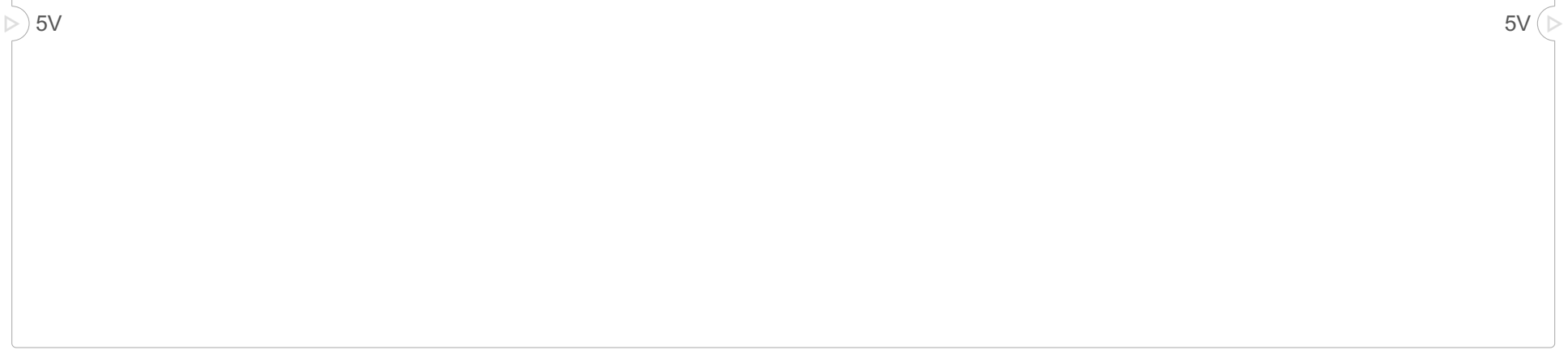
1GHz Microcontroller Unit (MCU)

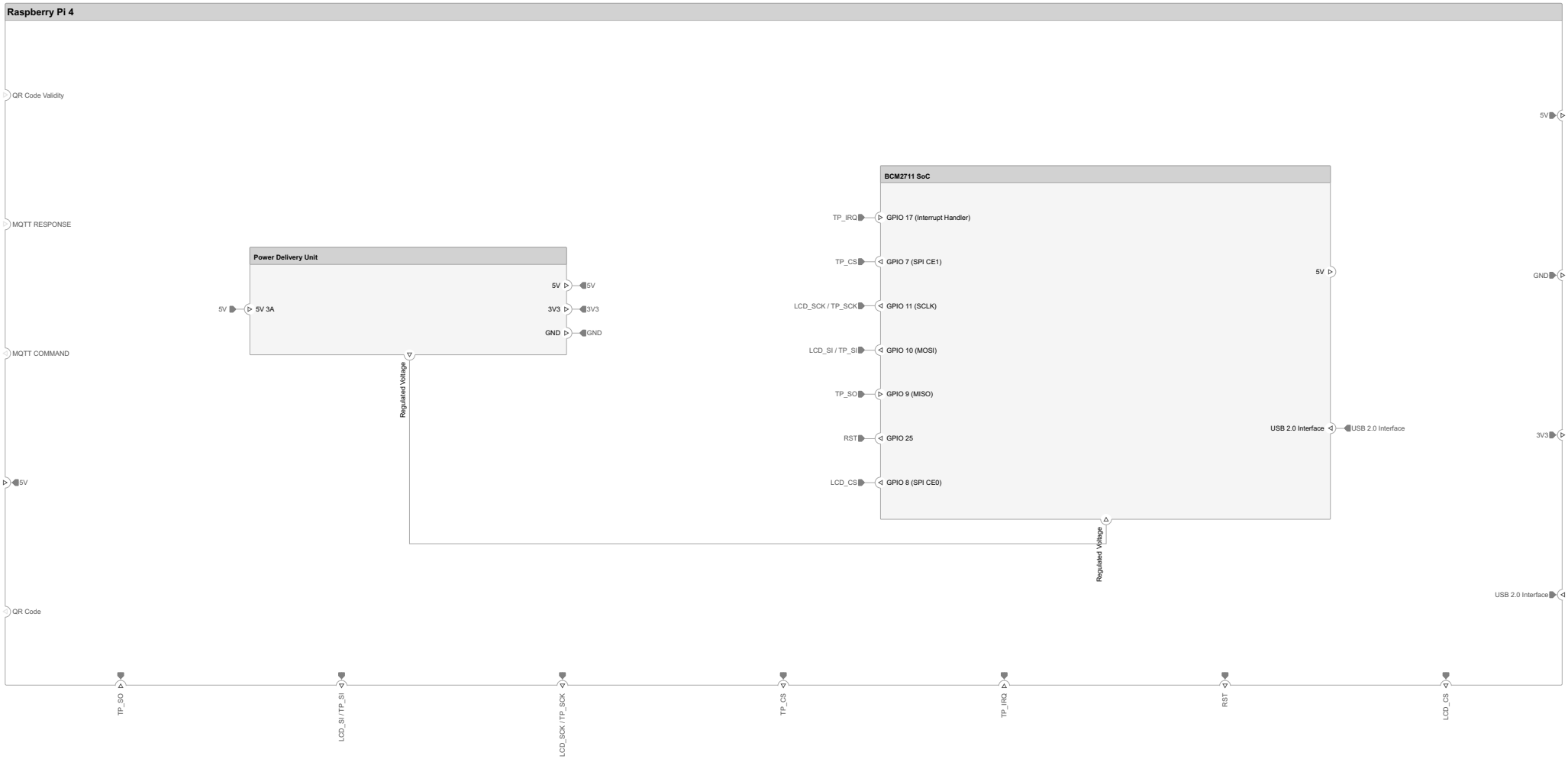
Post-Processed Image

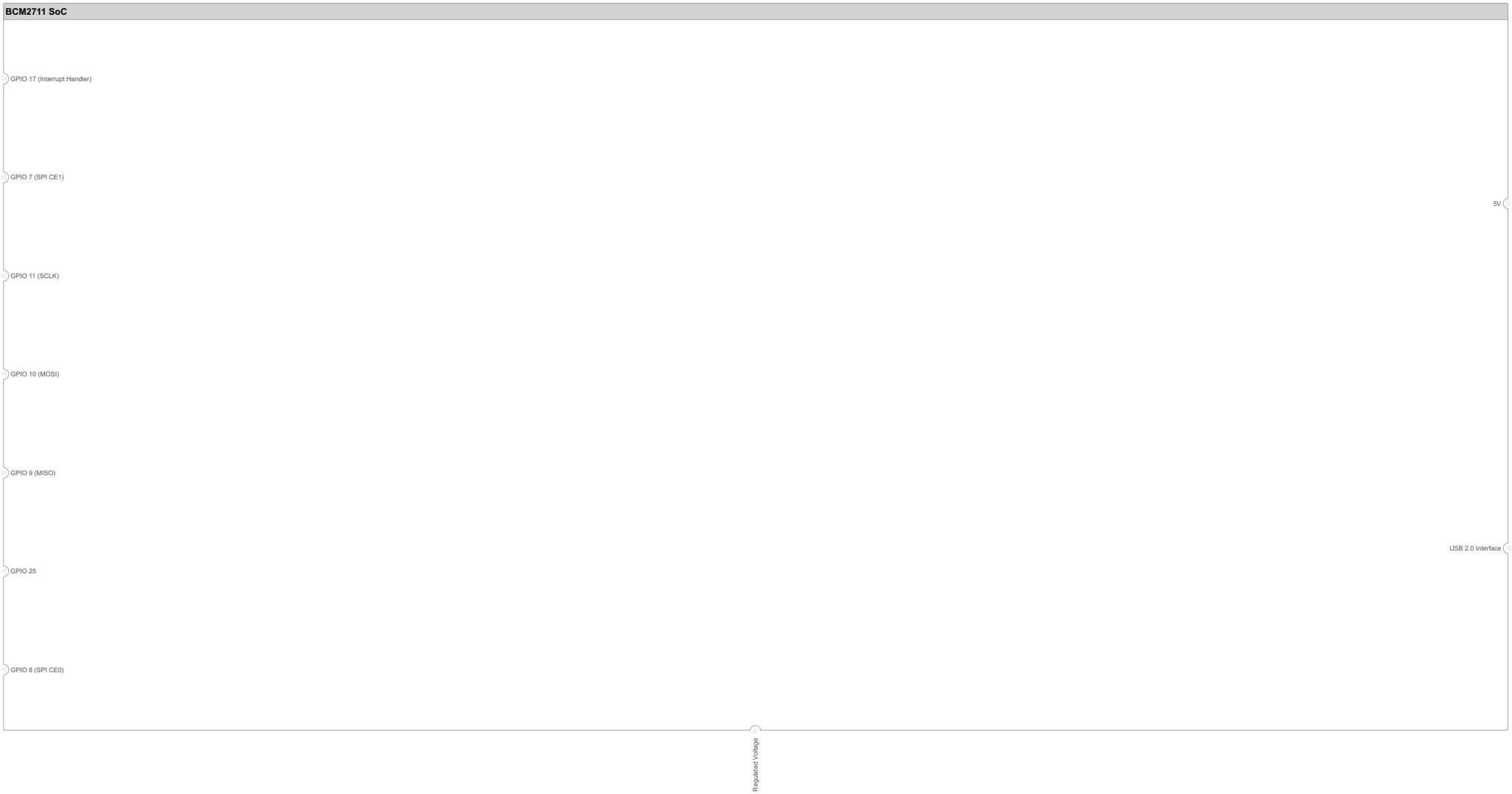
Raw Image

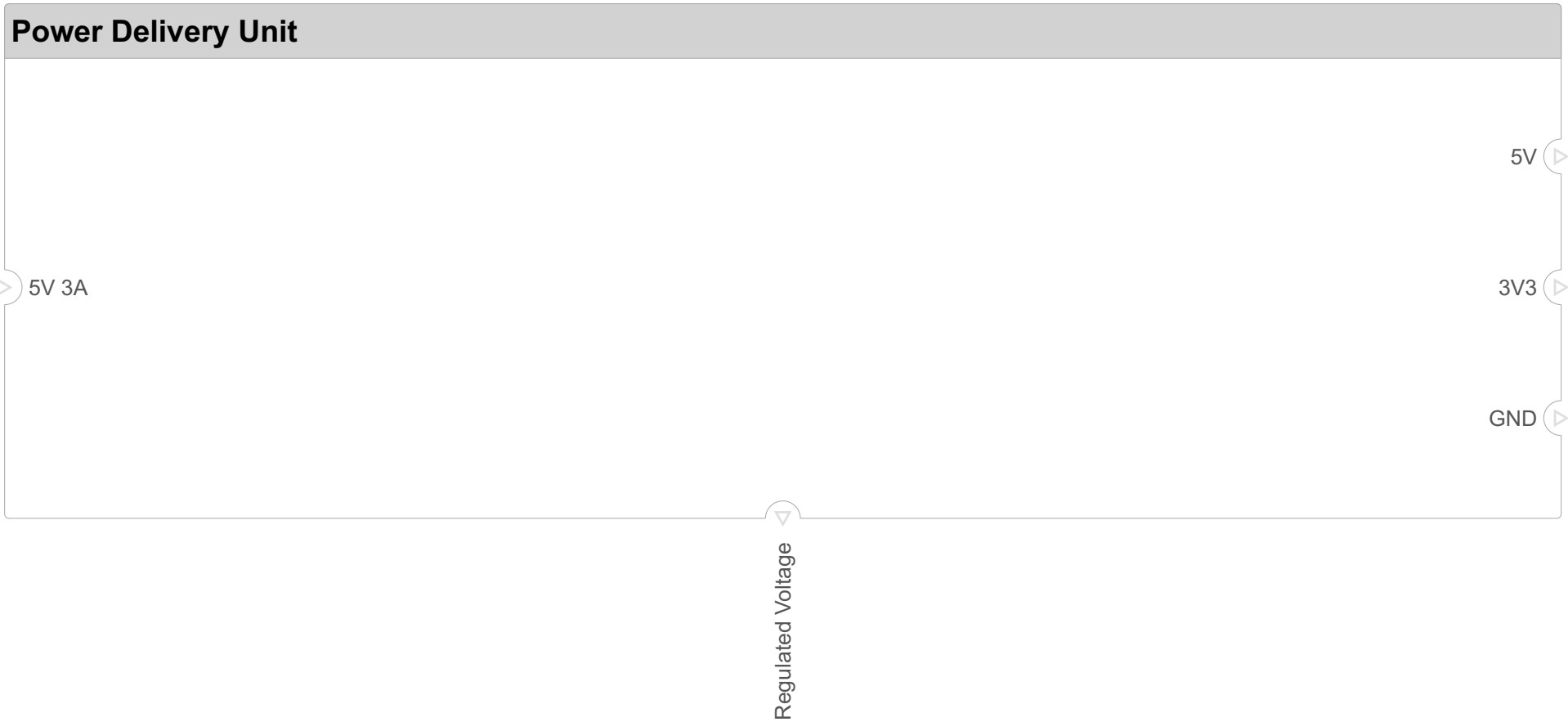

Pass-Through Power Supply
5V
10 Wh Power-Cells
5V
5V
5V
5V
5V
MQTT RESPONSE

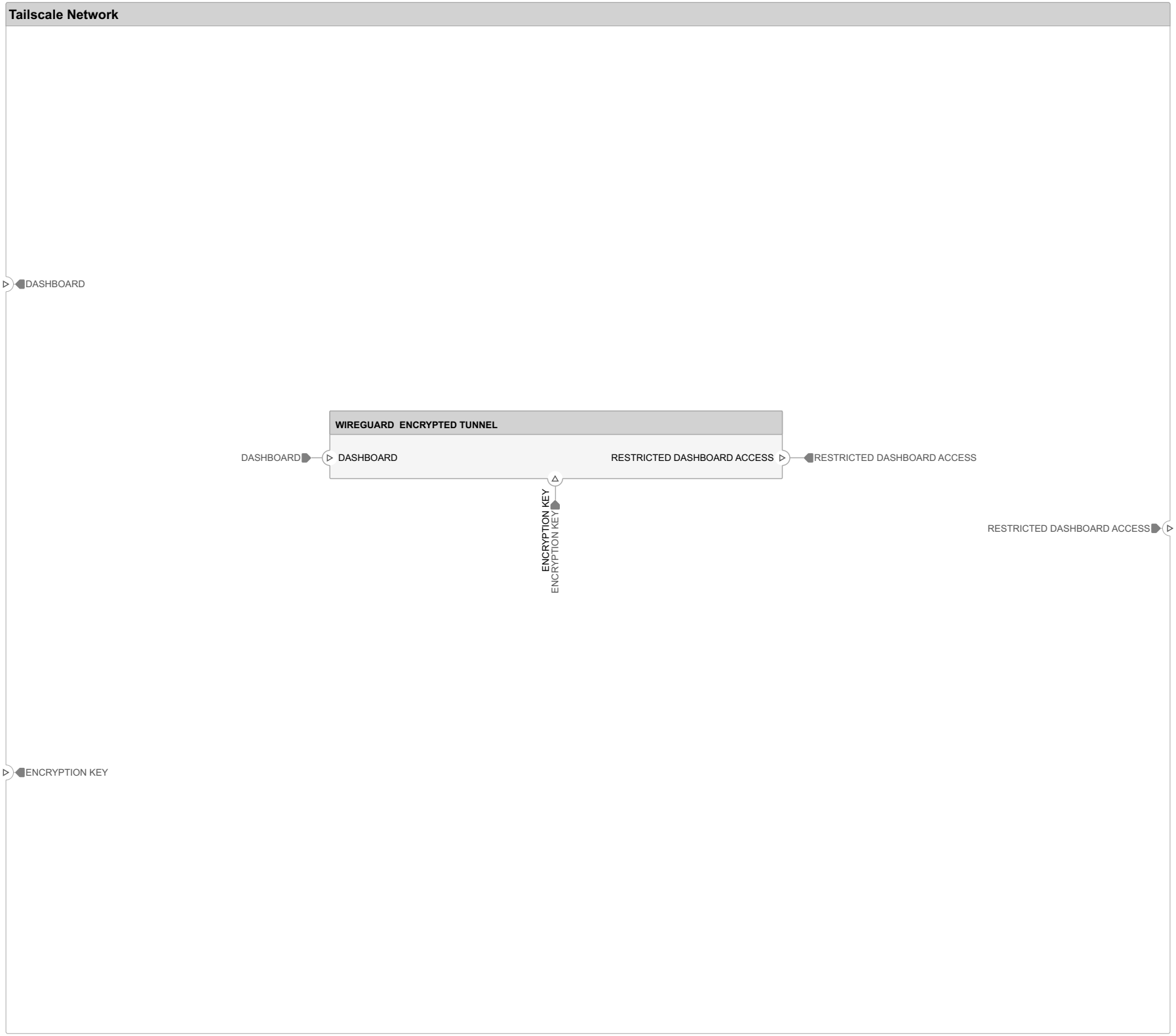
10 Wh Power-Cells




Raspberry Pi 4
QR Code Validity
MQTT RESPONSE
MQTT COMMAND
5V
QR Code
Power Delivery Unit
5V
5V 3A
5V
3V3
GND
5V
3V3
GND
Regulated Voltage
BCM2711 SoC
TP_IRQ
GPIO 17 (Interrupt Handler)
TP_CS
GPIO 7 (SPI CE1)
LCD_SCK / TP_SCK
GPIO 11 (SCLK)
LCD_SI / TP_SI
GPIO 10 (MOSI)
TP_SO
GPIO 9 (MISO)
RST
GPIO 25
LCD_CS
GPIO 8 (SPI CE0)
5V
USB 2.0 Interface
USB 2.0 Interface
Regulated Voltage
5V
GND
3V3
USB 2.0 Interface
TP_SO
LCD_SI / TP_SI
LCD_SCK / TP_SCK
TP_CS
TP_IRQ
RST
LCD_CS


BCM2711 SoC
GPIO 17 (Interrupt Handler)
GPIO 7 (SPI CE1)
GPIO 11 (SCLK)
GPIO 10 (MOSI)
GPIO 9 (MISO)
GPIO 25
GPIO 8 (SPI CE0)
5V
USB 2.0 Interface
Regulated Voltage


Power Delivery Unit
5V
5V 3A
3V3
GND
Regulated Voltage


Tailscale Network
DASHBOARD
WIREGUARD ENCRYPTED TUNNEL
DASHBOARD
DASHBOARD
RESTRICTED DASHBOARD ACCESS
RESTRICTED DASHBOARD ACCESS
ENCRYPTION KEY
ENCRYPTION KEY
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WIREGUARD ENCRYPTED TUNNEL
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