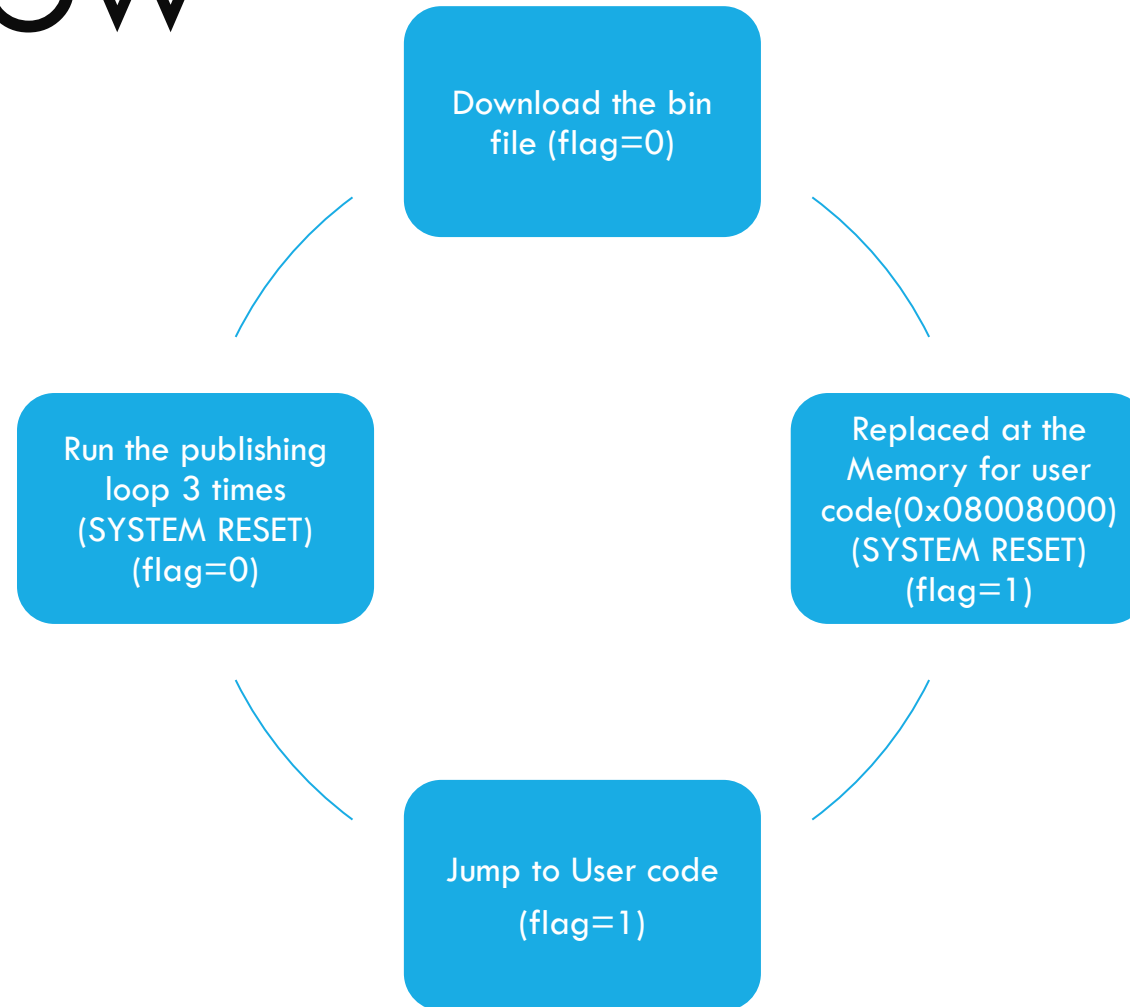




OTA BOOTLOADER

UP-TO 02/08/2022 (SPRINT 32)

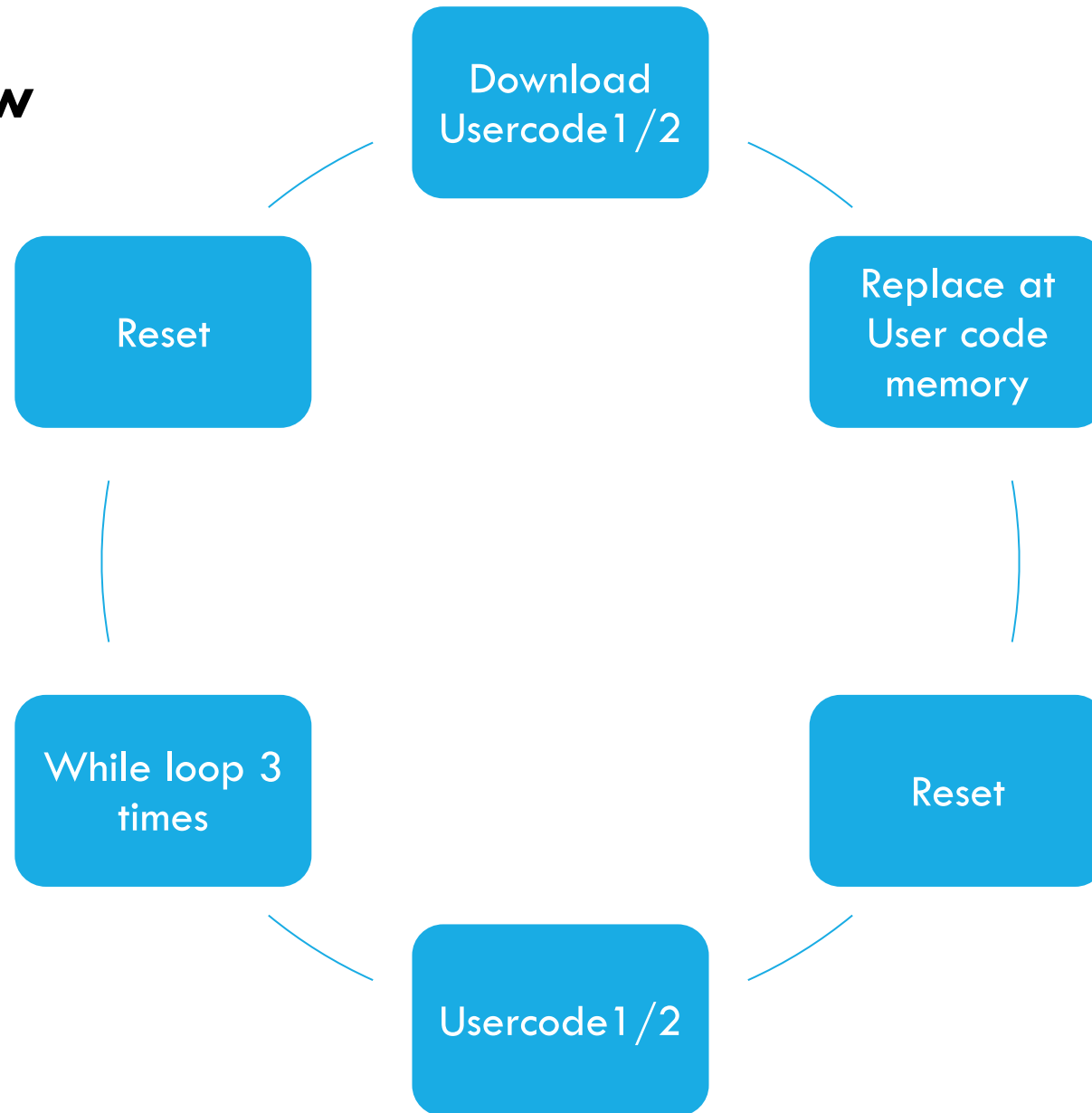
WORKING FLOW IMPLEMENTED UP-TO NOW

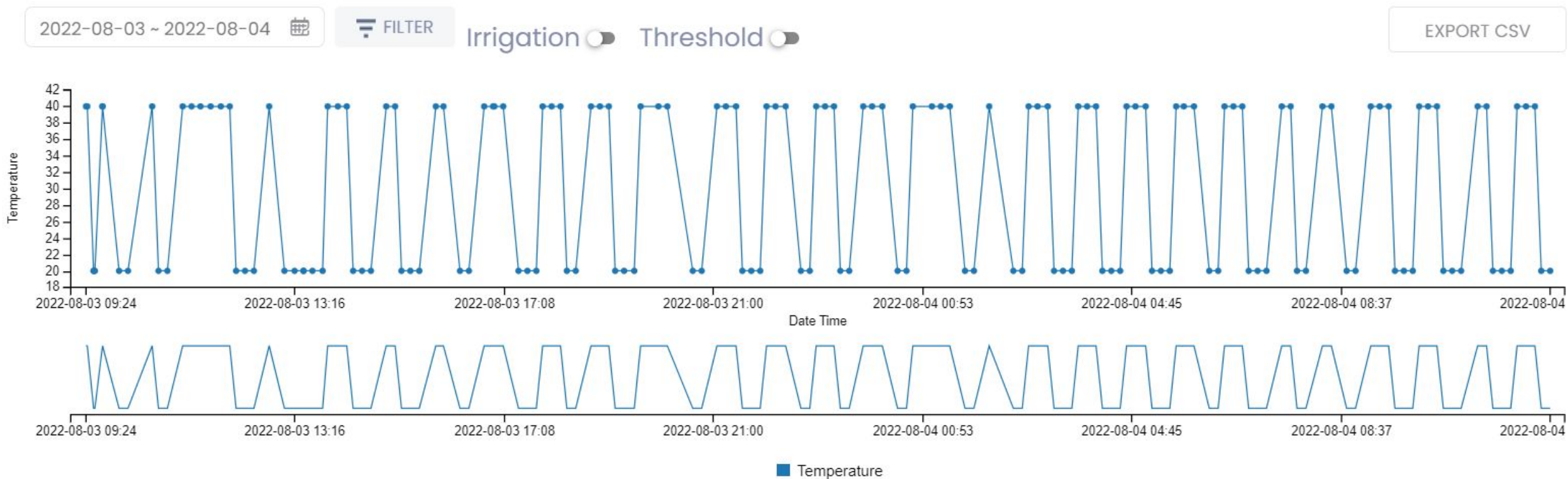


NOW ON TESTING

With two URLs implemented. (check the downloading in normal room environment)

Testing flow





RESULTS

Total time= 24h 5min (9.25-9.30)

Download had to be =53.5

Downloads occurred=50

Missed=3

Error =5.6%

TESTING PLANS

- Low signal area- Oven
- With no sim card
- Various battery powers
- With Solar panel

ISSUES HAVE TO BE SHORTED OUT

Increasing downloading size (Now working on...):-

7 mins-downloading and replacing.

5 mins- Just for connecting to server and downloading the file

Signal have to be smooth. But, can't ensure on low signal areas.

Increasing Downloading size per loop ☐ decrease the time

OTA validation check:- Just assuming - Validation flag = 1(Hardcoded).

Handling error codes:- Error in downloading –Just system resetting.

Have to add organized loopings to handle the errors. (process not planed yet)

Subscribe part have to be added:- Flag control in user code through MQTT subscribed message (Process not planed yet)

A background graphic featuring a complex network of interconnected nodes and lines. The nodes are represented by circles of various sizes and colors, including dark blue, light blue, and grey. The lines are thin and grey, creating a web-like structure. Some nodes are highlighted with larger, semi-transparent circles in the background.

OTA BOOTLOADER

UP-TO 18/08/2022 (SPRINT 33)

PROGRESS

Increasing download size and time optimization :-

Previously.....

7 mins-downloading and replacing.

5 mins- Just for connecting to server and downloading the file

Now.....

- Downloading as 16kb -Buffer size changed(Due to RAM size - 20kb)
- Writing and erasing as 8 pages (also RAM over flowed)
- RX_READ_TIMEOUT= 20 s

Output:-

Total time for download:- around 6 min (00:05:48)

For downloading and writing only:- nearly 00:02:42

Connection establishment:- 00:03:45

OTA validation check (Working on.....)

Handling error codes:- Error in downloading –Just system resetting.

Have to add organized loops to handle the errors. (process not planned yet)

Subscribe part have to be added:- Flag control in user code through MQTT subscribed message
(Process not planned yet)

Error throw flag- Tried

But failed. trying to short-out.

TESTING PROGRESSES

- 1) **Previous continuous testing**
Continued for 1 week- worked perfectly
OTA download continuous testing (3/8/2022-9/8/2022).....
(9.24 am to 9.24 am)
 $8640 \text{ min} / 27 \text{ min} = 320 \text{ downloads}$
Actually happened = 294
Error = 8.1%
- 2) **Increased downloading size and time optimization**
03:09:38 -03:14:54 (2d 5min)-2885 mins
Downloads...
Have to be - $2885 / 26 = 110$
Occurred - 98
Error rate - 11%

Temperature
40.0 °C

Humidity
0.0 %

Moisture
104.55 %

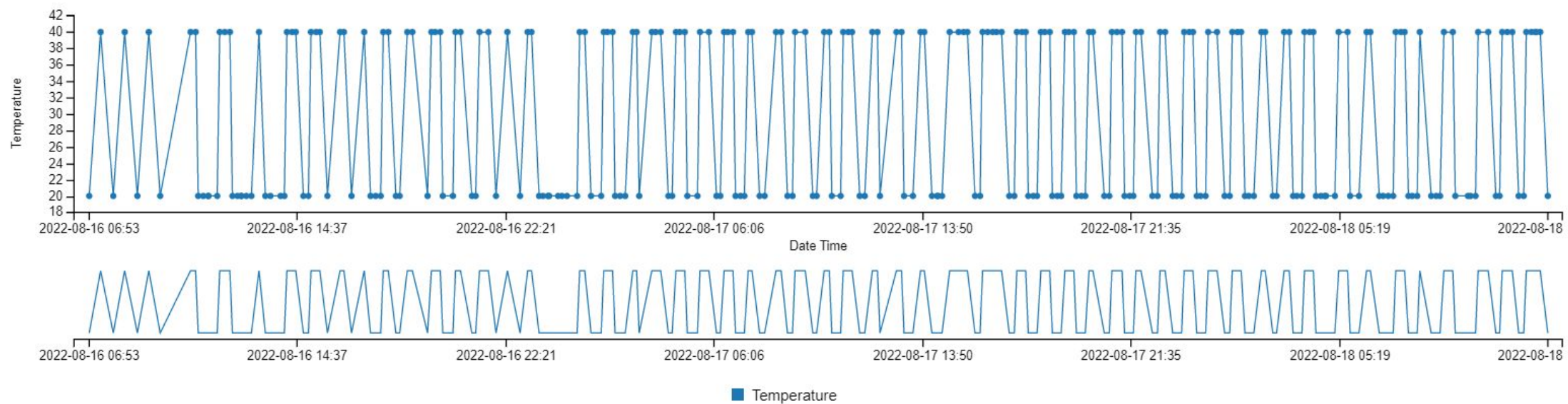
Soil conductivity
142.29 $\mu\text{S}/\text{cm}$

2022-08-16 ~ 2022-08-18

FILTER

Irrigation ☐ Threshold ☐

EXPORT CSV



A complex network diagram with various sized nodes (circles) in blue, black, and grey, connected by thin grey lines. Some nodes are highlighted with larger concentric circles. The background is white with faint grey circular patterns.

OTA BOOTLOADER

UP-TO 29/09/2022 (up-to SPRINT 37)

PROGRESS

Error throw flag- Tried
But failed. trying to short-out.
(Sorted out and implemented)

Increasing download size and time optimization :-

Previously.....

7 mins-downloading and replacing.

5 mins- Just for connecting to server and downloading the file

Now.....

- Downloading as 16kb -Buffer size changed(Due to RAM size - 20kb)
- Writing and erasing as 8 pages (also RAM over flowed)
- RX_READ_TIMEOUT= 20 s

Output:-

Total time for download:- around 6 min (00:05:48)

For downloading and writing only:- nearly 00:02:42

Connection establishment:- 00:03:45

OTA validation check :-

Checking the error throw value to detect the error happened when downloading stopped.

Subscribe part (In progress...):-

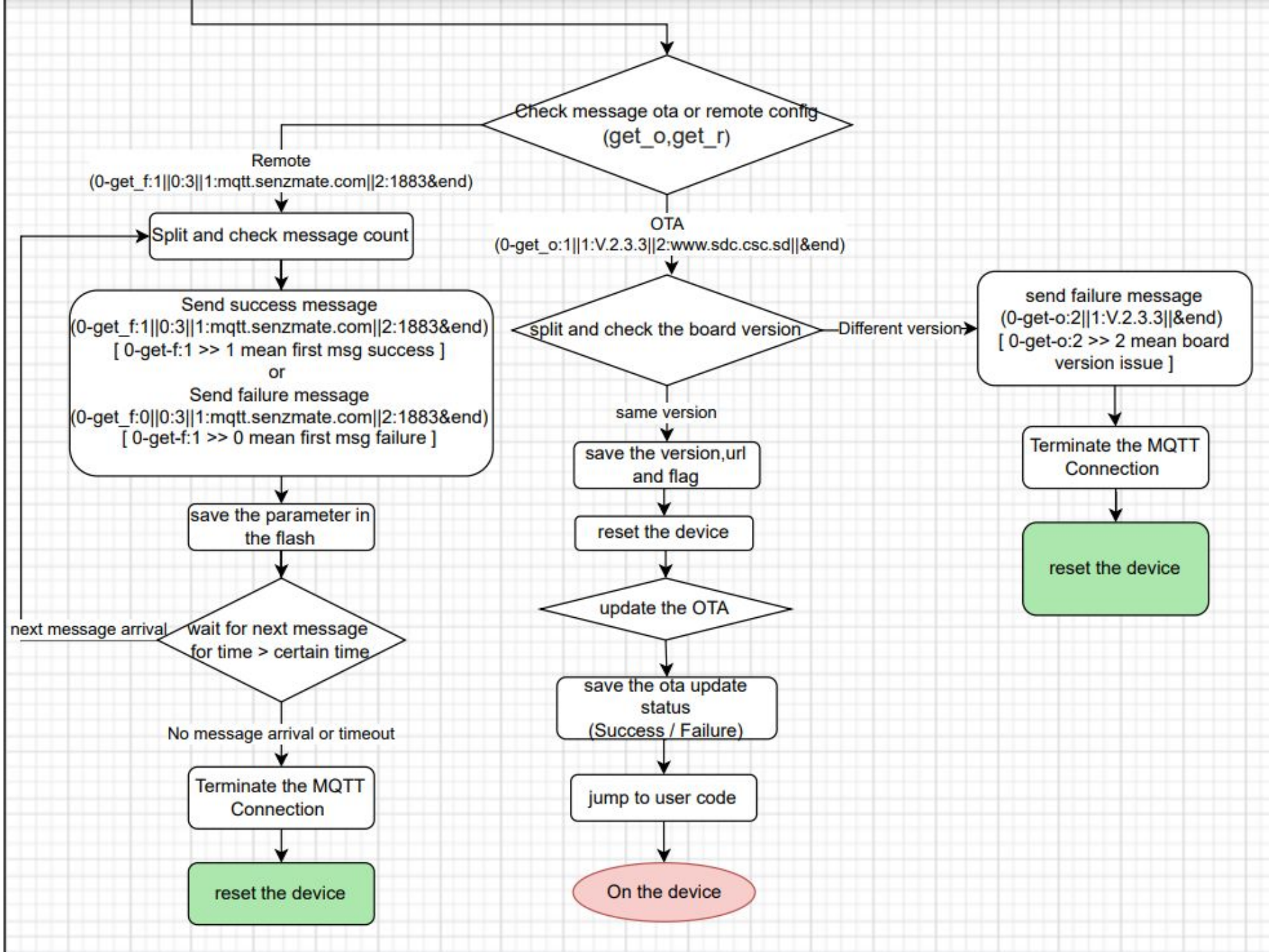
URL, version, and flag control through the MQTT subscribed message.

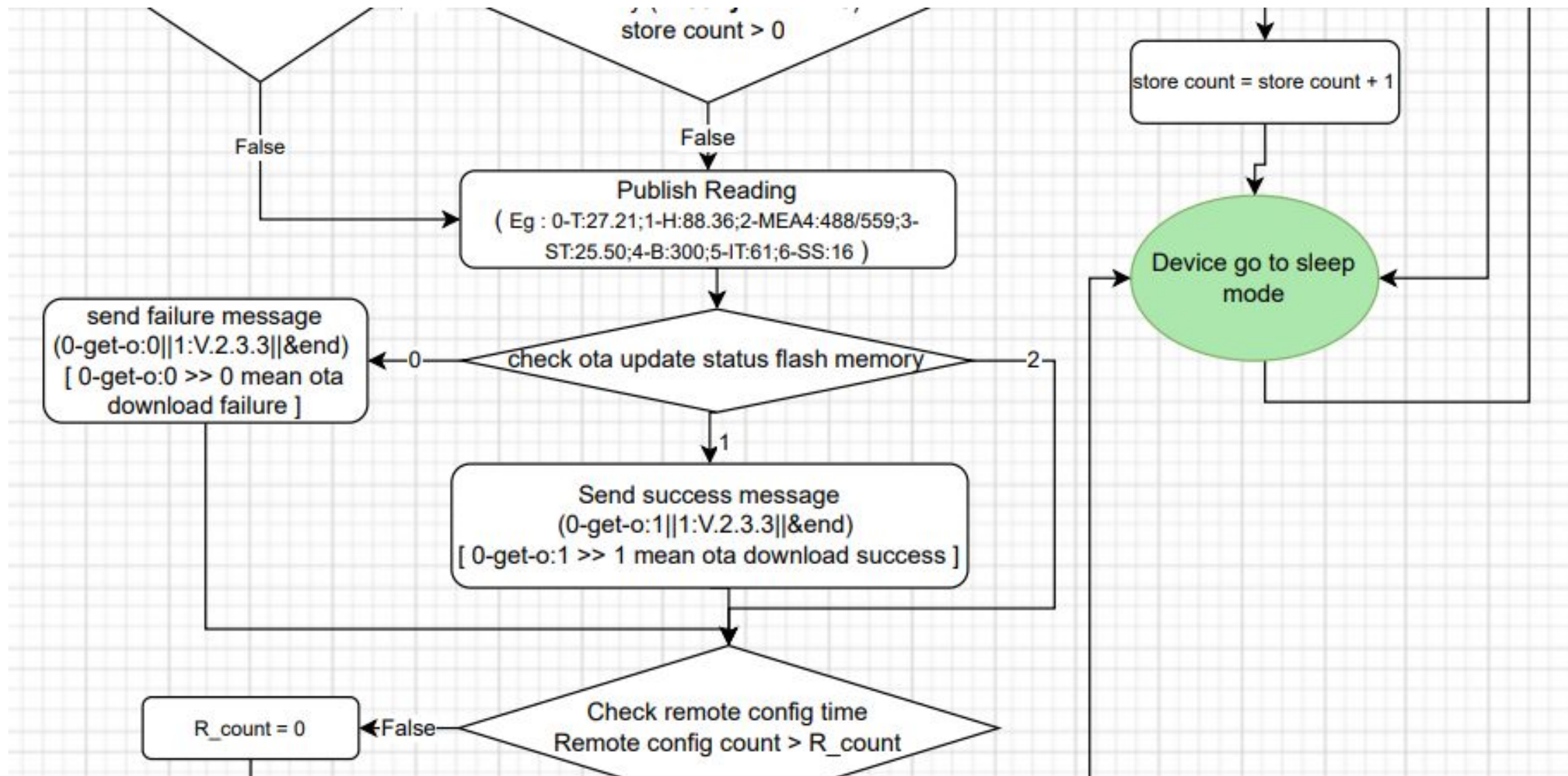
Handling error codes:- Error in downloading –Just system resetting.

Have to add organized loops to handle the errors. (process not planned yet)

Subscribe part (In progress...):-

- URL reading and writing functions added to the both OTA Bootloader and Usercode.
- Memory overflowed= have to clean the code of Bootloader and Usercode
- Splitting MQTT message
- Version check
- Flag and URL Writing.
- OTA update status
- Publishing update status





Continuous test results of Error throw implemented code.

ERROR RATE=20% each day
ERR-1=7=7/month (**AT COMMAND INITIALIZATION**)
ERR-3 =50+56+46+56+17+24=249/month (**APN CONNECTION**)
ERR-4=1+2+1=4/month (**OPEN CONNECTION**)
ERR-5=1+1=2/month (**HTTP CONNECTION ENITIALIZATION**)
HTTPREAD()-2+4+3+6+5+2+3+1+2+2+2=32/month

On 4,5,6/9/2022 dates -downloading is collapsed most.

average signal strength is 19.

On other days signal strength > 20 & the average is around 21.

Moreover, the error percentage is around 20%. Previously while the error percentage was 11%; signal strength is in the range between 25 and 30

Temperature
20.0 °C

Humidity
0.0 %

Moisture
0.0 %

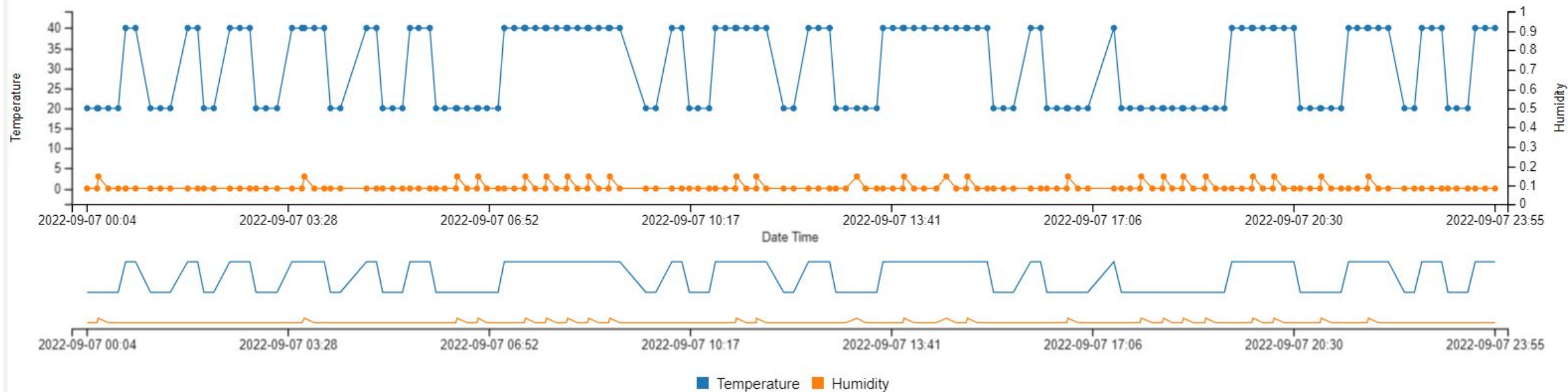
Soil conductivity
150.67 $\mu\text{S}/\text{cm}$

2022-09-07 ~ 2022-09-07



FILTER

Irrigation ☐



A background graphic featuring a complex network of interconnected nodes and lines. The nodes are represented by circles of various sizes and colors, including dark blue, light blue, and grey. The lines are thin and grey, creating a web-like structure. Some nodes are highlighted with larger, semi-transparent circles in the background.

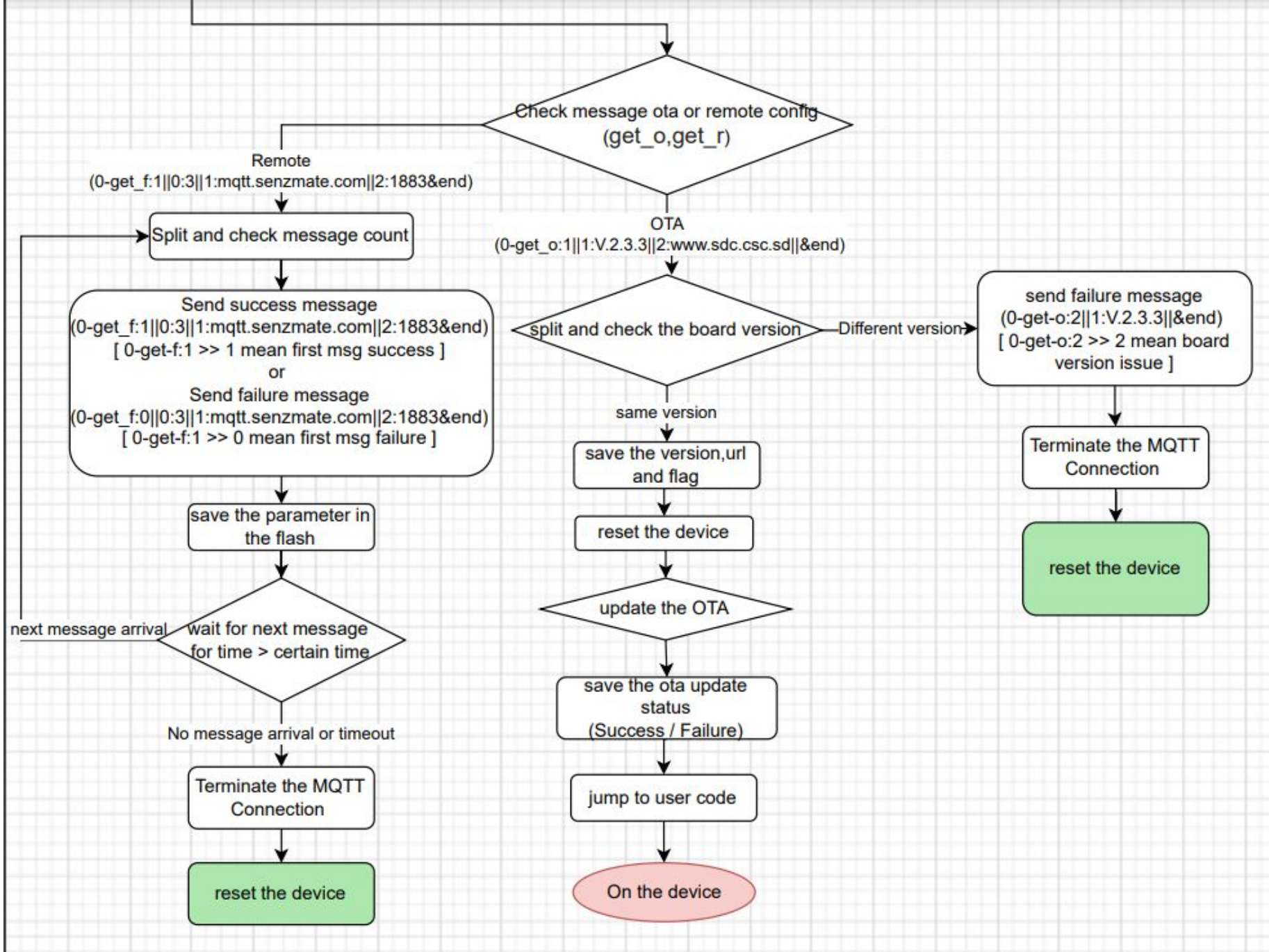
OTA BOOTLOADER

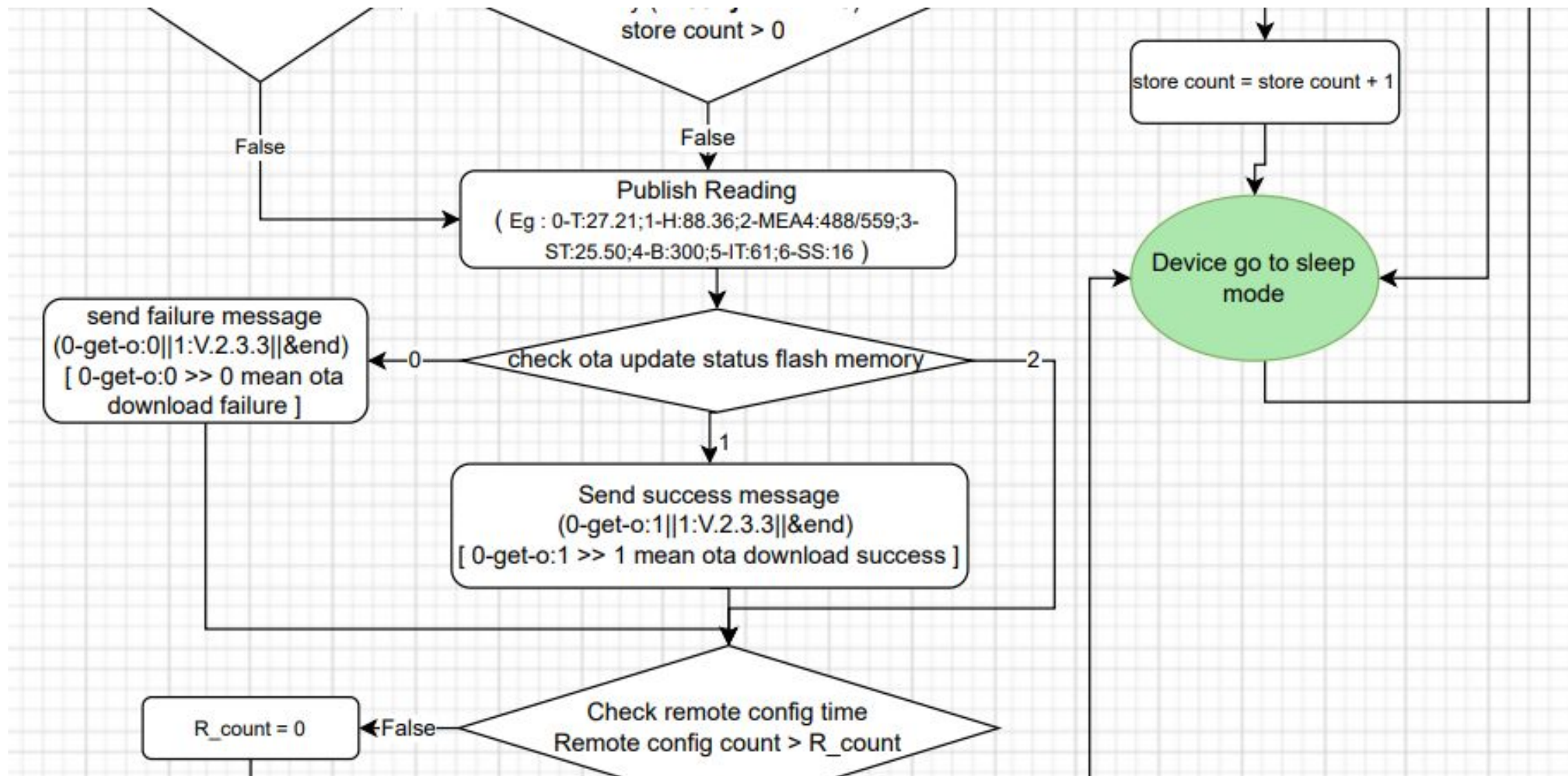
UP-TO 13/10/2022 (up-to SPRINT 38)

UP to now.....

- Splitting MQTT message
- Version check
- Flag and URL Writing.
- OTA update status writing and reading
- Publishing update status


FOLLOWING FLOW HAS IMPLEMENTED.....





Future plans

- Align with Remote configuration code(in progress...)
- All parameters writing to one page(in progress....)
- Memory have to be reduced to 79kB-(To run with OTA bootloader)
- Loop test with OTA bootloader

A complex network diagram with numerous nodes of varying sizes (black, blue, and grey) connected by thin grey lines. Some nodes are highlighted with larger concentric circles. The background is white with faint grey circular patterns.

OTA BOOTLOADER

UP-TO 27/10/2022 (SPRINT 39)

Up to now.....

1. Align with Remote configuration code
2. All parameters writing to one page
3. Error solved while version check with writing function
4. Error solved while reading the memory
5. Issue that erasing remote config parameters while writing the OTA parameters through subscribed message was sorted out.
6. problem that always publishing signal strength as 11 was solved.
7. Error while publishing flash saved reading sorted out.
8. Bootloader code is edited according to the changes made on user code.

Future plans

1. OTA bootloader and User code have to be checked in a looping format(OTA check)
2. Message format have to be changed
3. User code have to be checked with different remote configuration messages.
4. documentation for OTA

THANK YOU