STM Implement Communication Protocol

The STM communication protocol defines the structure of messages exchanged with the microcontroller.

Message Structure

START	CMD	LEN	DATA	CRC
0xAA				XOR

1. START — Indicates the beginning of a new message.

   Value: 0xAA.

2. CMD — Defines the type of command or request.

   Value: Operation code to be executed by the microcontroller.

3. LEN — Specifies the number of bytes in the DATA field.

4. DATA —Contains the payload data required for the command.

5. CRC (checksum) — Used to verify data integrity.

   Calculation: CRC = CMD ⊕ LEN ⊕ DATA[0] ⊕ DATA[1] ⊕ DATA[2] ⊕ ...

XOR truth table:

A	B	A ⊕ B
0	0	0
0	1	1
1	0	1
1	1	0

If the CRC verification fails, the message must be discarded and an error response should be returned.