USER MANUAL

I2C communication protocol - UHF Antenna II

UHF ANTENNA II

USER MANUAL – I²C COMMUNICATION PROTOCOL

This user manual is specially designed to detail the EnduroSat UHF Antenna II I²C communication protocol.

Please read carefully the manual before unpacking the antenna in order to ensure safe and proper use.

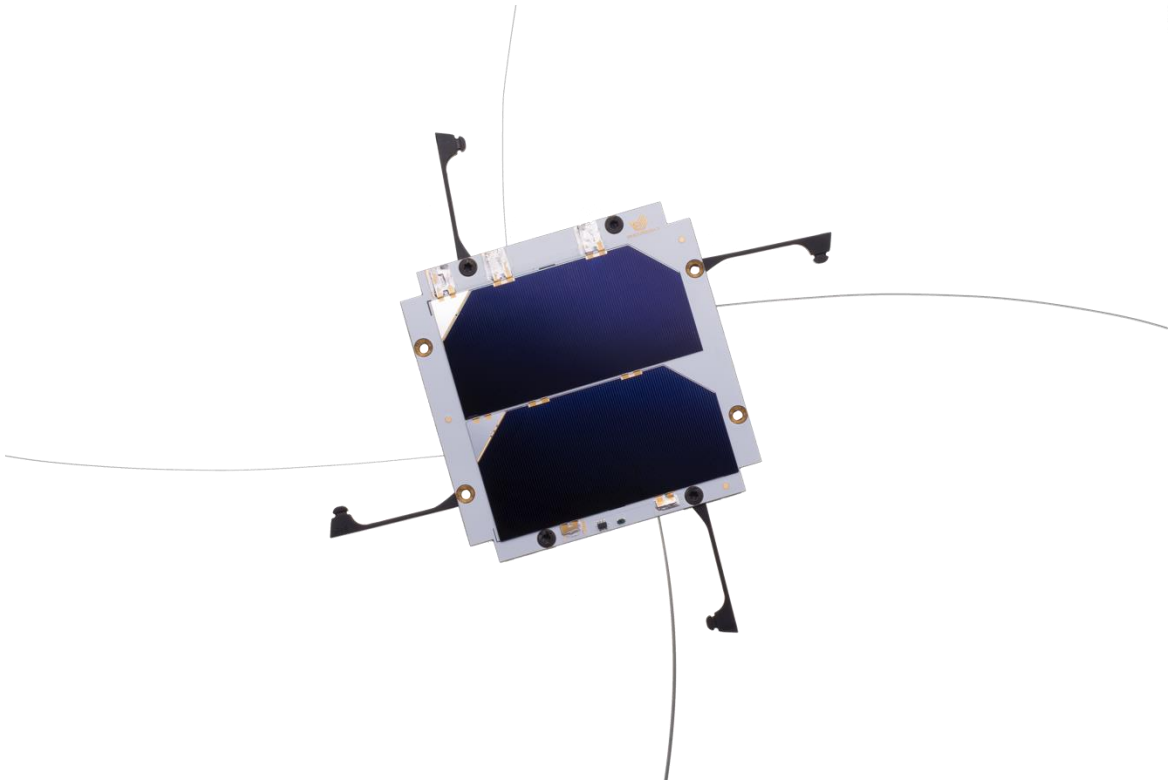


Figure 1 – EnduroSat UHF Antenna II (Solar panel is a separate product)

1 CHANGE LOG

Date	Version	Note
21/Nov/2016	Rev 1	
02/May/2017	Rev 2	New protocol revision
01/Feb/2018	Rev 2.2	Deployment algorithms clarifications added, minor text enhancements
16/Oct/2018	Rev 2.3	Modifications in READ and WRITE command

2 I²C COMMUNICATION PROTOCOL

The I²C communication with the dedicated microcontroller of the antenna enables commanding and collecting feedback from the module.

6-bit slave address of UHF Ant. is **0x33** (the address can be changed upon request).

Clock speed is 400 KHz.

Pull-up 4.7k Ohm resistors are mounted on the UHF antenna I²C interface. The resistors value can be changed upon request.

2.1 READ command return result is 3-byte and has following structure:

First byte:

MSB							LSB
D4	D3	D2	D1	0	0	S2	S1

Where:

- D1 - D4 represent the door position (the four antenna rods).
  - „0“ - door is closed / antenna rod not deployed
  - „1“ - door is opened / antenna rod deployed
- S1 and S2 show the current antenna mode = S2*2^1+S1*2^0.

States (modes – S1, S2)	Command name	Description
0x00	MODE_ALL_OFF	Clear all recent commands
0x01	MODE_ALGORITHM_1	Turn On Algorithm 1
0x02	MODE_ALGORITHM_2	Turn On Algorithm 2

Second byte:

MSB							LSB
A4	A3	A2	A1	B4	B3	B2	B1

Where:

- A1 - A4: currently engaged main heaters
- B1 - B4: currently engaged back-up heaters

Third byte:

Shows currently elapsed timer in seconds.

2.2 WRITE command format:

0	0	S2	S1	Ant4	Ant3	Ant2	Ant1

- Bits Ant1 - Ant4 select which heater to be engaged (antenna rods to be deployed).
- Bits S2 and S1 define the deployment algorithms as follows:

States (modes – S1, S2)	Command name	Description
0x00	MODE_ALL_OFF	Clear all recent commands
0x01	MODE_ALGORITHM_1	Turn On Algorithm 1
0x02	MODE_ALGORITHM_2	Turn On Algorithm 2

Examples:

0x1F - Execute Algorithm1 for all 4 antenna rods.

0x2F – Execute Algorithm2 for all 4 antenna rods.

0x21 – Execute Algorithm2 only for the first antenna rod.

0x16 – Execute Algorithm1 for the third and second antenna rod.

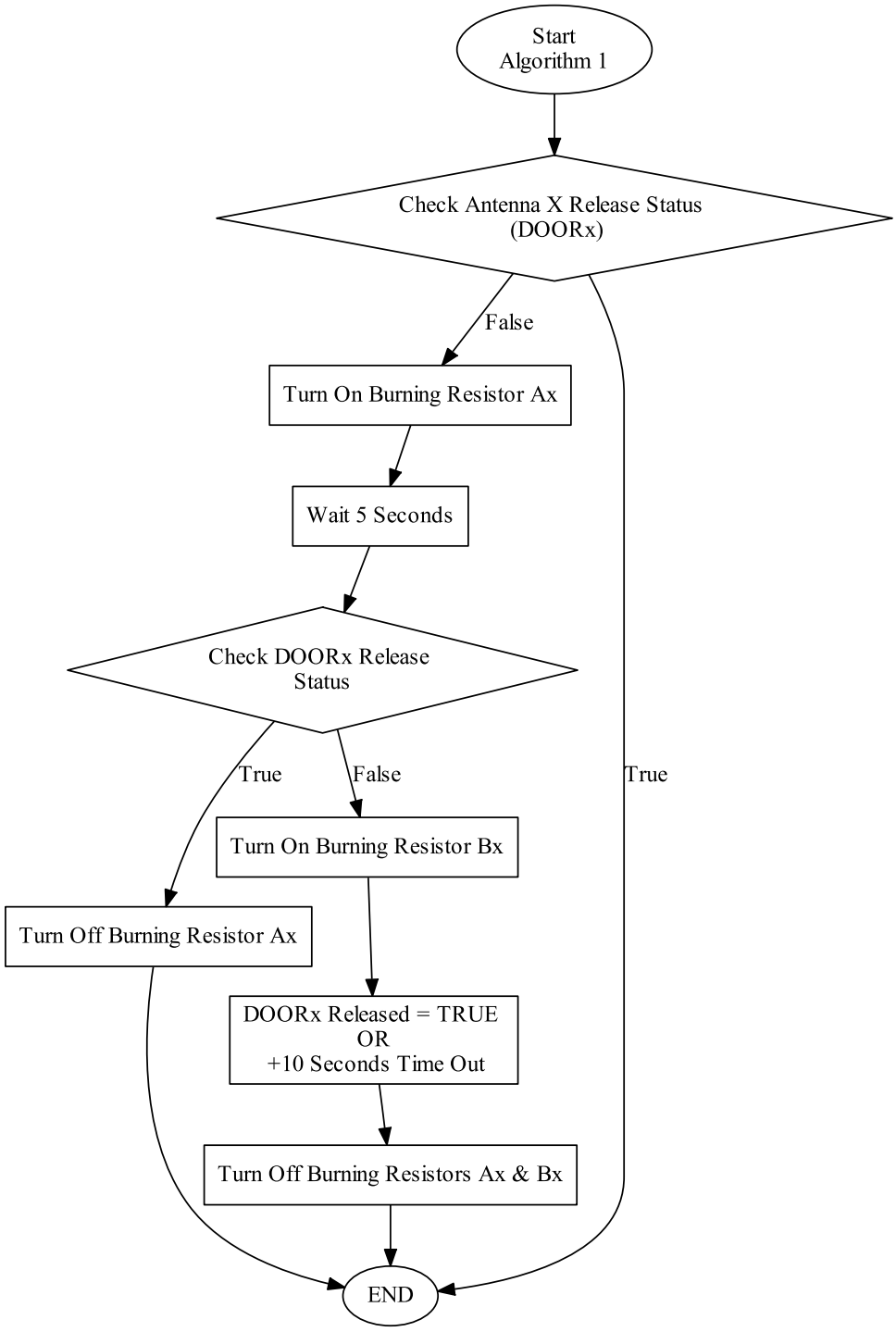
0x00 – Clear and interrupt all recent commands

3 DEPLOYMENT ALGORITHMS

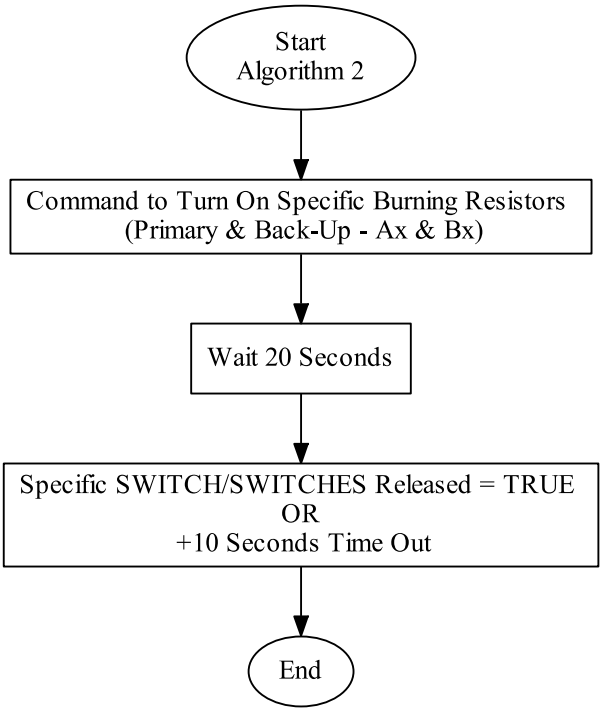
Two algorithms for deployment are implemented into the microcontroller of the antenna. They can be executed for any antenna rod and all possible combinations. When an algorithm is executed for multiple antenna rods, it is applied consecutively for the rods in numerical order.

3.1 ALGORITHM 1:

X defines the specific numbering of doors/antenna rods (antenna rods numbering is shown in figure 2)



3.2 ALGORITHMS 2:



4 ANTENNAS NUMBERING:

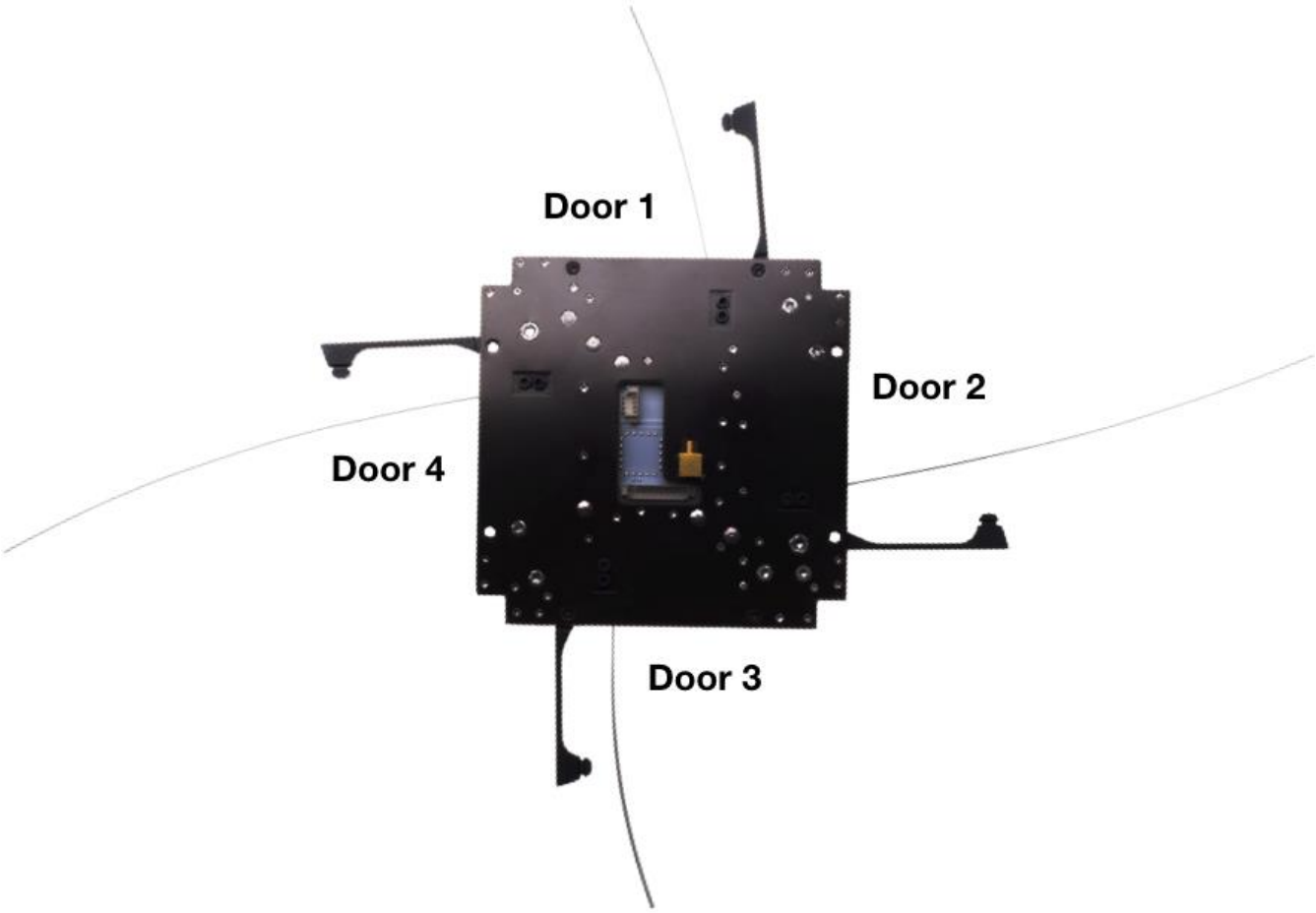


Figure 2

5 SUGGESTED MAIN SEQUENCE AFTER DEPLOYMENT