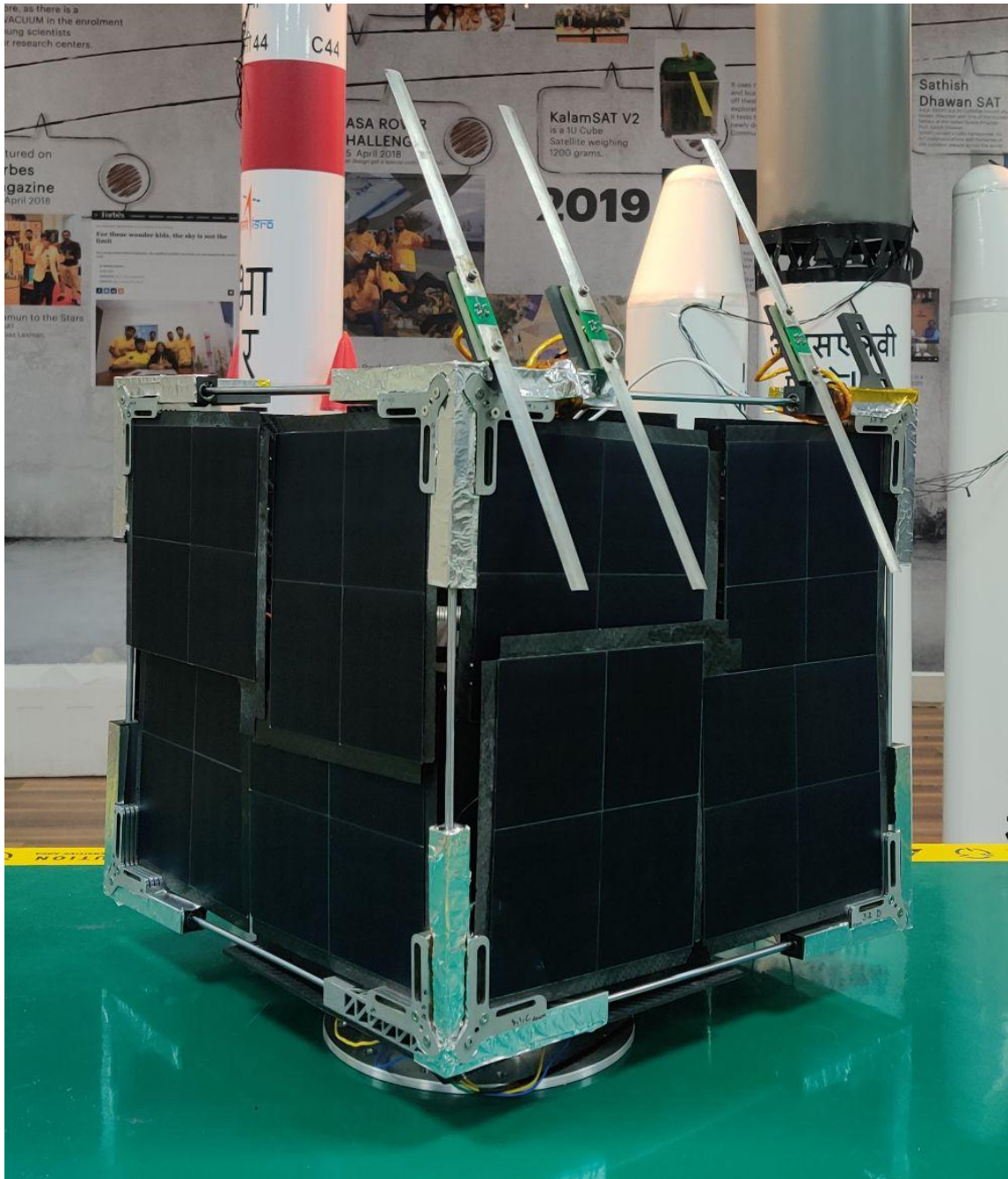


AzaadiSAT-2

Celebrating Azaadi ka Amrit Mahotsav



RF Parameters



AzaadiSAT-2 Satellite in fully expanded configuration - 400 x 400 x 400 mm - equivalent to 64U Cubesat

AzaadiSAT-2 - LoRa Parameters:

Carrier Frequency: 437.4 Mhz
Bandwidth: 125.0 kHz
Spreading Factor: 9
Coding Rate: 7
Output Power: 22 dBm / 30 dBm
Preamble Length: 8 Symbols
Sync Word: 0x12
Gain: 0

AzaadiSAT-2 - AX.25 Parameters:

Frequency: 437.4 Mhz
Output Power: 22 dBm / 30 dBm
Frequency Shift: 425 Hz
Baud Rate: 1k2 Baud
Stop Bits: 1

Transmitter_type

0 : TRANSMITTER_100mW
1 : TRANSMITTER_1W

Message_type

1: SATELLITE_INFO
2 : STORE_AND_FORWARD_MESSAGE

Health Beacon Frame Structure:

```
typedef struct satellite_info {  
  
    char call_sign[6];  
  
    uint8_t frame_number;  
  
    uint8_t message_type;  
  
    uint8_t transmitted_on;  
  
    uint16_t boot_counter;  
  
    uint8_t deployment_status;  
  
    float obc_temperature;  
  
    float bus_voltage;  
  
    float bus_current;  
  
    float battery_temperature;  
  
    float radiation;  
  
    uint8_t checksum;  
  
} satellite_info;
```

Store and Forward Message:

```
typedef struct store_and_forward_message {  
  
    char call_sign[6];  
  
    uint8_t frame_number;  
  
    uint8_t message_type;  
  
    uint8_t transmitted_on;  
  
    uint8_t message_slot;  
  
    uint8_t size;  
  
    char message[size];  
  
    uint8_t checksum;  
  
} store_and_forward_message;
```

Uplink Command for Store and Forward Message:

>10,0,[SLOT NUMBER],[MESSAGE]

Example:- >10,0,00,Namaste World

Stores "Namaste World" in slot 00

The default slot is zero(00) which will be transmitted in every transmission cycle. 01-99 slots will be transmitted on request.

Note: The maximum length of the beacon message should be at most 70 characters. Should only contain A-Z, a-z, 0-9, !, @ \$ % ^ () ? ; : <SPACE>

The slot number should always be a two-digit representation number, for example, 5th slot should be requested as 05 the case is applicable for numbers between 0 to 9.

Transmission Cycle:

Start → Receive Mode (45 sec) → LoRa Health Packet → AX.25 Health Packet → CW Beacon → Store and Forward Message (LoRa) → End (Loop)

This entire transmission takes 15 seconds to happen and there will be 45 seconds in receive mode, so there will be one transmission loop every minute.