

SatRevolution Pre-UniBus



Overall description and features	<p>1U, 1.5U or 2U Cubesat SatRevolution platform with flight heritage.</p> <p>Equipped with SatRevolution all necessary subsystems to provide service to payloads:</p> <ul style="list-style-type: none"> · Power system with up to 25W of peak power · Advanced attitude determination and control system with 0.2 degrees of pointing accuracy (magnetorqs and reaction wheels) · Redundant UHF for command telemetry communication system · 36 months of mission lifetime · Range of innovative payload and data services available
Structure	<p>Space-proven Pre-UniBus structure:</p> <ul style="list-style-type: none"> · CNC manufactured of Aluminium 6061, 5083, 6082 alloy · Hard anodized and oxidized · Up to 2 safety deployment switches and 1 RBF pins · Two separation springs
Interfaces	<p>Proprietary design allows for smooth payload integration process.</p> <p>Interfaces available: Possible payload interfaces: 2xI2C, 4xSPI, 3xUART. Other interfaces are available on request.</p>
Power	<p>Space proven Electrical Power System:</p> <ul style="list-style-type: none"> · Peak power 25W · Voltage at fully charge is 12,6V and 35Wh · System redundancy, autonomous fault handling and recovery · Battery supervisory circuit · Hardware protection from excessive discharge · Hardware MPPT implementation · User programable up to 6A maximum battery pack load current · Support for highly depleted battery charging · User programable 2.5A or 4.6A maximum battery pack load current · Unregulated battery voltage bus, two 3.3V bus and 1.8V bus in a redundant topology · Configurable overcurrent protection for 1.8V bus in the range of 100mA to 600mA and for · 3V bus in the range of 100mA to 2A with a soft-start for cooperation with sensitive loads · Programmable level of overvoltage and undervoltage thresholds · I2C communication for diagnostic purposes

	<ul style="list-style-type: none"> · Battery pack consists of 3 batteries (max 4,2V each and 3200mAh) connected in series
On-board computing	<p>A Space-proven Command and Data Handling module with following capabilities:</p> <ul style="list-style-type: none"> · Main processor: up to 16MHz, 256kB FRAM, Ultra Low Power Modes · Storage memory: 8MB · Payload power switches: 3.3V and Battery Voltage with adjustable current limit · Possible payload interfaces: 2xI2C, 4xSPI, 3xUART · Regulated 12V power supply · Multiple temperature sensors · Working temperatures: -30°C to 65°C · Power Supply: independent DC/DC converter <p>Over The Air update</p>
Communication	<p>Redundant Low frequency communication module include:</p> <ul style="list-style-type: none"> · Two independent radio transceiver · Low Power Consumption: 2.8W at 30dBm RF, output power on UHF · Modulations: (G)FSK, 2(G)MSK, OOK · Automatic Frequency Control: +/- 25kHz · High receiver's sensitivity: minimum -105dBm at 9.6kbps · UHF/VHF operational frequency 142 - 146 MHz, 432.5 - 438 MHz · UHF max RF power output: 29 dBm · Data interface: RS485 with configurable frequency, data rate up to 64kbps, modulation, RF connector (type, position, orientation - 60bit synchronization · Forward Error correction: Reed-Solomon 1/4 with downlink protocols APRS AX.25 1.2kbps or custom binary protocol 9.6-64kbps · Uplink protocol: custom binary protocol 9.6kbps · 128/256 hardware AES encryption/decryption with time coding and digital signature coding schemes · Safety watchdog · Single PCB radio · Single board Telemetry, Telecommand, and Beacon capabilities <p>Over The Air update</p>
Accuracy	<p>Platform is equipped with following attitude determination and control subsystems:</p> <ul style="list-style-type: none"> · Space-proven advance flight computer · Processor: up to 100MHz · Storage memory: 8MB · Actuators: 3x magnetorquers, possible 3x Reaction Wheels · Internal Measurement Unit (IMU): Gyroscope, Magnetometr, GPS Position 2.5m CEP, Velocity 0,1m/sec, Max 50Hz rate · SGP4/SGD4, IGRF12, B-DOT, EKF, GS tracking algorithms available. · Coars sun-sensors · Fine sun-sensors <p>Platform allows for the following accuracy:</p> <ul style="list-style-type: none"> · <1 degree of positioning accuracy · <1 degree of pointing accuracy