

176 IMS -2 Bus (Indian Mini Satellite - 2 Bus)

U R Rao Satellite Centre (URSC) of Indian Space Research Organisation (ISRO) has developed IMS-2 mainframe bus technology to provide a platform for satellites with user defined payload. These satellites are envisaged to be launched on-board PSLV into a LEO sun-synchronous orbit with a design life of around 5 years.

176.1 Salient Features and Applications

1. This satellite is of weight class 450 kg with Mainframe bus weight of 300 ± 10 kg and Payload weight up to 150 ± 10 kg.
2. Single bus system with redundancy for all subsystems.
3. This class of satellite has attained high importance in various fields of applications with user defined payloads like remote sensing, space science, defence, technology demonstration for space application, Earth Observation Missions (EOM) for agriculture, forestry, geology, ocean & atmospheric monitoring, Hyper Spectral Imaging etc.

176.2 Major Specifications

Sub-System	Specifications
Structure	<ol style="list-style-type: none"> 1. Spacecraft Mass: 450 kg (Main frame cuboid ~ 300 ± 10 kg, Payload: ~ 150 ± 10 kg). 2. Main frame Bus: 1098 mm x 1118 mm x 615 mm. 3. Payload Module: User defined. 4. Compatible for PSLV load specifications
Propulsion	<ol style="list-style-type: none"> 1. Active Mono-propellant system with 25 kg fuel tank
Mechanism	<ol style="list-style-type: none"> 1. HOP actuator/Frangi bolt-based Deployment mechanism.
Thermal	<ol style="list-style-type: none"> 1. Passive thermal control with Augmented Heaters
BDH & SSR	<ol style="list-style-type: none"> 1. Integrated Baseband Data Handling (BDH) & Solid-State Recorder (SSR) system. 2. Maximum input peak rate (raw mode) from payload - 3.2 Gbps. 3. Maximum storage capacity of 2.8 Tbits with Flash based memory modules for payload.
OBC	<ol style="list-style-type: none"> 1. On Board Computer with HX 1750 Processor. 2. 8 MB on-board memory.
RF systems	<ol style="list-style-type: none"> 1. S-band TM transmitter & TC Receiver <ol style="list-style-type: none"> a. 64 Kbps/ 128 Kbps (Tx) b. 4Kbps, PCM/PSK/FM (Rx)

	<ol style="list-style-type: none"> 2. X-Band Data Transmitter <ol style="list-style-type: none"> a. Data rate up to 960 Mbps with 8PSK modulation 3. SPS Receiver <ol style="list-style-type: none"> a. 12-channel Multi GNSS Receiver (MGR) at L1 and L5 frequencies b. Data Transmitting antenna is Dual-Gimballed Antenna.
AOCS	<ol style="list-style-type: none"> 1. Pointing accuracy: $\pm 0.1^\circ$ (3σ) on all 3 axes. 2. Drift Rate: $\pm 5.0 \times 10^{-4}^\circ/\text{s}$ (3σ). 3. Three axes stabilized with high-torque reaction wheels with 15Nms and 0.3Nm torque capability. 20 A-m2 Magnetic torquers for attitude control & momentum dumping. 4. Sun & Star sensors / Magnetometers for sun pointing and for safe attitude control.
Power Systems	<ol style="list-style-type: none"> 1. SA Power generation of 700 W at EOL, with 2 panels on each side of size 1.2 m x 0.81 m. 2. Single Li-ion Battery (67 Ah) tied bus system with Raw bus voltage of 30 to 42V. 3. Mainframe load: ~ 300W. 4. MIL1553B based TMTC Interface
Payload	<ol style="list-style-type: none"> 1. Payload Mass: 150 ± 10 kg. 2. Payload Power support upto 300W. 3. Payload module is mechanically independent.

176.3 Technology Transfer from ISRO

URSC-ISRO offers to transfer IMS-2 BUS technology to industries in India with adequate experience and facilities. Industries interested in obtaining knowhow may write giving details of their present activities, infrastructure and facilities. Enterprises interested in obtaining knowhow may register and submit their proposal to IN-SPACE, Ahmedabad at www.inspace.gov.in