WorldView-1

WorldView-1, launched September 2007, is the first of our next-generation satellites—the most agile satellites ever flown commercially. The high-capacity, panchromatic imaging system features half-meter resolution imagery. Operating at an altitude of 496 km, WorldView-1 has an average revisit time of 1.7 days and is capable of collecting over one million sq km per day of half-meter imagery. The satellite is also equipped with state-of-the-art geolocation accuracy capabilities and exhibits stunning agility with rapid targeting and efficient in-track stereo collection. WorldView-1 is currently on the move. Over the course of two years the orbit will be adjusted to achieve a descending node of 1:30pm.

Features

» Very high resolution

» Industry-leading geolocation accuracy
   » Ultra-stable platform, high-precision attitude sensors and GPS

» Highest capacity over a broad range of collection types (wider than any competitor)

» Bi-directional scanning

» Rapid retargeting using Control Moment Gyros (>2x faster than any competitor)

» Direct downlink to customer sites available

» World-class telescope
   » High contrast (MTF) and signal-to-noise ratio
   » Selectable Time Delay Integration (TDI) levels

» Frequent revisits at high resolution

Benefits

» Provides highly detailed imagery for precise map creation, change detection, and in-depth image analysis

» Geolocate features to less than 5 m to create maps in remote areas, maximizing the utility of available resources.

» Collects, stores, and downlinks a greater supply of frequently updated global imagery products than competitive systems

» Stereoscopic collection on a single pass, ensures image continuity and consistency of quality

» Extends the range of suitable imaging collection targets and enhances image interpretability
Design and specifications

Launch Information
Date: September 18, 2007
Launch Vehicle: Delta 7920 (9 strap-ons)
Launch Site: Vandenberg Air Force Base, California

Orbit
Altitude: 496 km
Type: Sun synchronous, 10:30 am descending node
Period: 95 min.
Altitude: 496 km
Type: Sun synchronous, 1:30 pm descending node
Period: 95 min.

Mission Life
10-12 years, including all consumables and degradables (e.g. propellant)

Spacecraft Size, Mass and Power
3.6 m (12 ft) tall x 2.5 m (8 ft) across
7.1 m (23 ft) across the deployed solar arrays
2290 kg (5038 lbs)
3.2 kW solar array, 100 Ahr battery

Sensor Bands
Panchromatic: 400 - 900 nm

Sensor Resolution
50 cm Ground Sample Distance (GSD) at nadir
55 cm GSD at 20° off-nadir

Dynamic Range
11-bits per pixel

Swath Width
17.7 km at nadir

Attitude Determination and Control
3-axis stabilized
Actuators: Control Moment Gyros (CMGs)
Sensors: Star trackers, solid state IRU, GPS

Pointing Accuracy and Knowledge
Accuracy: <500 m at image start and stop
Knowledge: Supports geolocation accuracy below

Retargeting Agility
Time to Slew 200 km: 10 sec

Onboard Storage
2199 Gb solid state with EDAC

Communications
Image and Ancillary Data: 800 Mbps X-band
Housekeeping: 4, 16 or 32 kbps real-time, 524 kbps stored, X-band
Command: 2 or 64 kbps S-band

Max Contiguous Area Collected in a Single Pass (30° off-nadir angle)
Mono: 111 x 112 km (6 strips)
Stereo: 51 x 112 km (3 pairs)

Revisit Frequency (at 40°N Latitude)
1.7 days at 1 m GSD or less
5.4 days at 20° off-nadir or less (0.55 m GSD)

Geolocation Accuracy (CE90)
Demonstrated <4.0 m CE90 without ground control

Capacity
1.3 million km² per day

All imagery complies with U.S. regulation.

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