WorldView-3

Introducing WorldView-3, the first multi-payload, super-spectral, high-resolution commercial satellite. Operating at an expected altitude of 617 km, WorldView-3 provides 31 cm panchromatic resolution, 1.24 m multispectral resolution, 3.7 m short-wave infrared resolution, and 30 m CAVIS resolution. WorldView-3 has an average revisit time of <1 day and is capable of collecting up to 680,000 km² per day, further enhancing the DigitalGlobe collection capacity for more rapid and reliable collection. Launching in 2014, the WorldView-3 system will allow DigitalGlobe to further expand its imagery product offerings.

Features

» Very high-resolution*
  - Panchromatic 31 cm
  - Visible & near-infrared 1.24 m
  - Short-wave infrared 3.7 m
  - CAVIS 30 m
  *Will be resampled for commercial distribution

» The most spectral diversity commercially available
  - Panchromatic band
  - 4 standard VNIR colors: blue, green, red, near-IR1
  - 4 added VNIR colors: coastal, yellow, red edge, and near-IR2
  - 8 SWIR bands: Penetrates haze, fog, smog, dust, and smoke
  - 12 CAVIS bands: Maps clouds, ice and snow, corrects for aerosol and water vapor

» Industry-leading geolocation accuracy

» High capacity in various collection modes

» Bi-directional scanning

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

» Direct Access tasking from and image transmission to customer sites

» Daily revisits

Benefits

» Simultaneous, high resolution, super-spectral imagery

» Large area mono and stereoscopic collection eliminates temporal variations

» Precision geo-location possible without ground control points

» Global capacity of 680,000 km² per day

» New and enhanced applications, including:
  - Mapping
  - Land Classifications
  - Disaster Preparedness/Response
  - Feature Extraction/Change Detection
  - Soil/Vegetative Analysis
  - Geology: Oil & Gas, Mining
  - Environmental Monitoring
  - Bathymetry/Coastal Applications
  - Identification of Man-made Materials

» Superior Haze Penetration
### Design and specifications

**Orbit**
- Altitude: 617 km
- Type: SunSync, 1:30 pm descending Node
- Period: 97 min.

**Life**
- Spec Mission Life: 7.25 years
- Estimated Service Life: 10 to 12 years

**Spacecraft Size, Mass and Power**
- Size: 5.7 m (18.7 ft) tall x 2.5 m (8 ft) across
- Mass: 2800 kg (6200 lbs)
- Power: 3.1 kW solar array, 100 Ahr battery

**Sensor Bands**
- Panchromatic: 450 - 800 nm
- 8 Multispectral:
  - Coastal: 400 - 450 nm
  - Blue: 450 - 510 nm
  - Green: 510 - 580 nm
  - Yellow: 585 - 625 nm
- 8 SWIR Bands:
  - SWIR-1: 1195 - 1225 nm
  - SWIR-2: 1550 - 1590 nm
  - SWIR-3: 1640 - 1680 nm
  - SWIR-4: 1710 - 1750 nm
- 12 CAVIS Bands:
  - Desert Clouds: 405 - 420 nm
  - Aerosol-1: 459 - 509 nm
  - Green: 525 - 585 nm
  - Aerosol-2: 635 - 685 nm
  - Water-1: 845 - 885 nm
  - Water-2: 897 - 927 nm

**Sensor Resolution**

<table>
<thead>
<tr>
<th>Band Type</th>
<th>Resolution (or GSD, Ground Sample Distance; off-nadir is geometric mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panchromatic</td>
<td>0.31 m</td>
</tr>
<tr>
<td>20° Off-Nadir</td>
<td>0.34 m</td>
</tr>
<tr>
<td>Multispectral Nadir</td>
<td>1.24 m</td>
</tr>
<tr>
<td>20° Off-Nadir</td>
<td>1.38 m</td>
</tr>
<tr>
<td>SWIR Nadir</td>
<td>3.70 m</td>
</tr>
<tr>
<td>20° Off-Nadir</td>
<td>4.10 m</td>
</tr>
<tr>
<td>CAVIS Nadir</td>
<td>30.00 m</td>
</tr>
</tbody>
</table>

**Dynamic Range**
- 11-bits per pixel Pan and MS; 14-bits per pixel SWIR

**Swath Width**
- At nadir: 13.1 km

**Attitude Determination and Control**
- Type: 3-axis Stabilized
- Actuators: Control Moment Gyros (CMGs)
- Sensors: Star trackers, precision IRU, GPS

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

**Retargeting Agility**
- Time to Slew 200 km: 12 sec

**Onboard Storage**
- 2199 Gb solid state with EDAC

**Communications**
- Image: 8
- Ancillary Data: 800 and 1200 Mbps X-band
- Housekeeping: 4, 16, 32, or 64 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: 68.5 km x 112 km (5 strips)
- Stereo: 26.6 km x 112 km (2 pairs)

**Revisit Frequency (at 40°N Latitude)**
- 1 m GSD: <1.0 day
- 4.5 days at 20° off-nadir or less

**Geolocation Accuracy (CE90)**
- Predicted <3.5 m CE90 without ground control

**Capacity**
- 680,000 km² per day

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### Collection scenarios

**Sensor bands**
- Panchromatic
- Multispectral
- 4 additional multispectral bands
- 8 SWIR bands
- 12 CAVIS bands