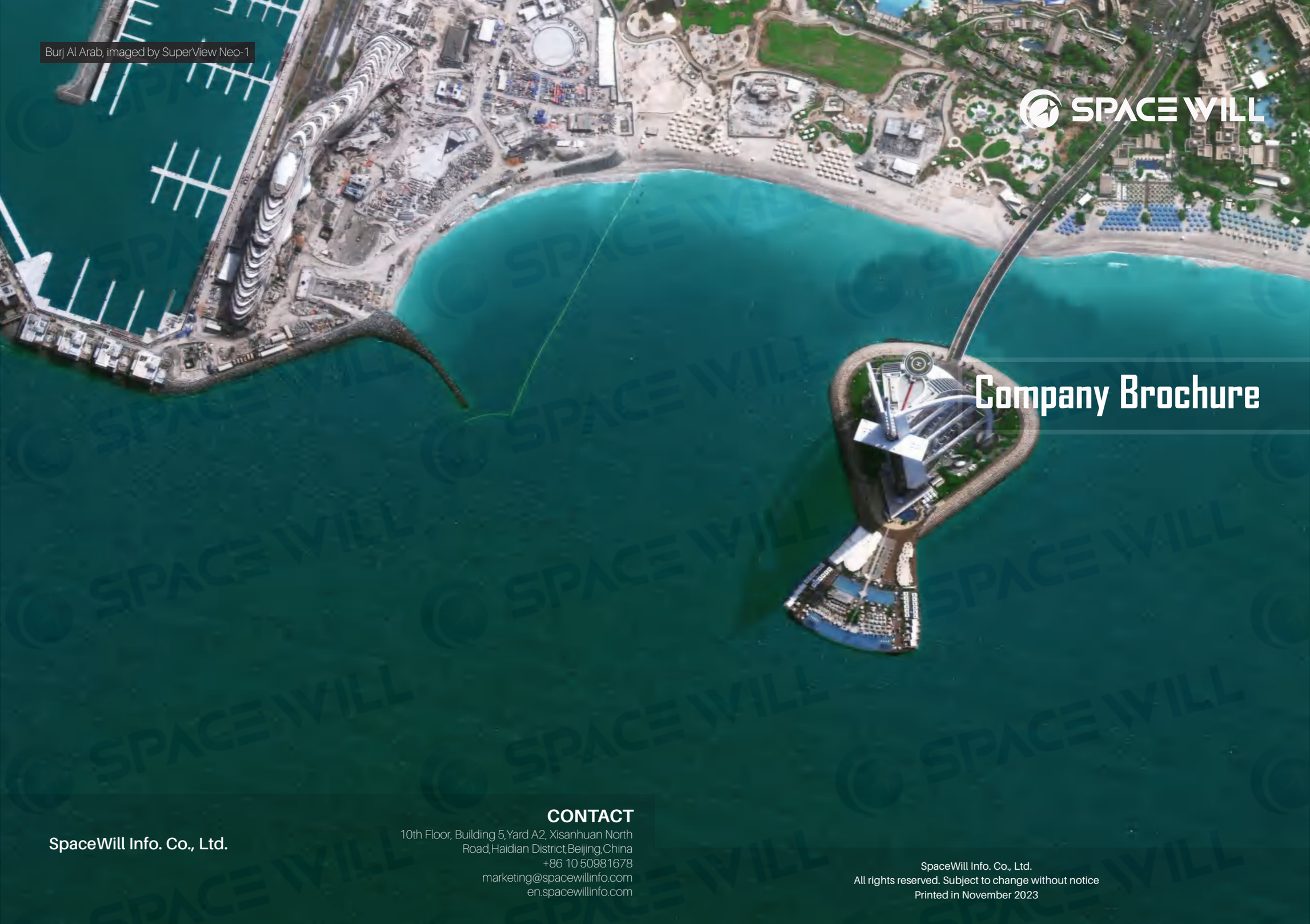

SPACE WILL

Company Brochure

SpaceWill Info. Co., Ltd.

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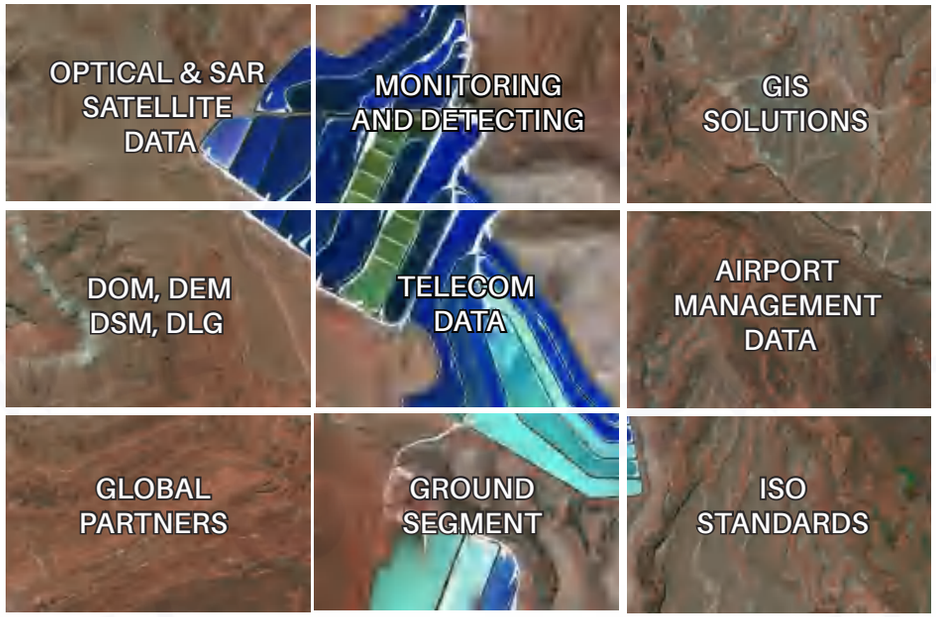
SPACEWILL

ABOUT SPACEWILL

Located in Beijing, SpaceWill Info. Co., Ltd. (short as SpaceWill) is a leading provider of EO satellite data and geospatial information services. The company business covers EO satellite data, data processing, value-added products, software, and solutions of satellite ground receiving segments.

SpaceWill is the major supplier of SuperView satellite data. SuperView are very-high-resolution commercial imaging satellites. So far there are 9 SuperView satellites in operation, and they are SuperView-1 (4 identical satellites), SuperView-2, SuperView Neo-1 (2 identical satellites) and SuperView Neo-2 (2 identical SAR satellites). The company is also authorized by Chinese government to distribute GF, ZY and HJ satellite data. These satellites include GF-1 (4 satellites), GF-2, GF-3 (3 SAR satellites), GF-4, GF-5, GF-6, GF-7, ZY-1 02 (2 satellites), ZY-3 (3 tri-camera satellites) and HJ-1.

SpaceWill has developed global partners network since 2016 when the first 2 SuperView were launched, and built partnership with over 70 companies around the world.



SV NEO-1 SATELLITES

The Pearl-Qatar, Doha, Qatar imaged by SV NEO-1

SUPERVIEW NEO-1 SATELLITES

30 cm Resolution, 4 MS bands, Stereo Imaging, High Agility

SuperView Neo-1 is a very-high-resolution optical satellite constellation, it consists of over 16 satellites with 20-30 cm resolution in the programme. SuperView Neo-1 01&02 are first two satellites of the programme, and they were launched on April 29, 2022. Combining with another 5 SuperView satellites (SuperView-1 and SuperView-2), SuperView provide the strong imaging ability to support geospatial applications and intelligent analytics for global users.

Technical Specifications

Mission life	6 years	
Launch time	April 29, 2022	
Orbit	Sun-synchronous, 10:30 am descending node 500 km altitude	
Resolution (at nadir)	Panchromatic: 30 cm; multispectral: 1.2 m	
Sensor bands	Panchromatic Blue Green	Red Near-infrared
Swath width (at nadir)	12 km	
Dynamic range at imaging	11 bits	
NIIRS Class	6.0	
Oblique viewing angle	±30° (normal), ±45° (extended)	
Revisit capacity	Daily	
Imaging modes	multi-target, multi-strip, bi/tri-stereo and corridor collection in one single pass	
Imaging capacity	1,500,000 km² (max capacity)	
Max acquisition for single target	60 km × 90 km	

SV-2 SATELLITE

Containers in Singapore Port Singapore, imaged by SV-2

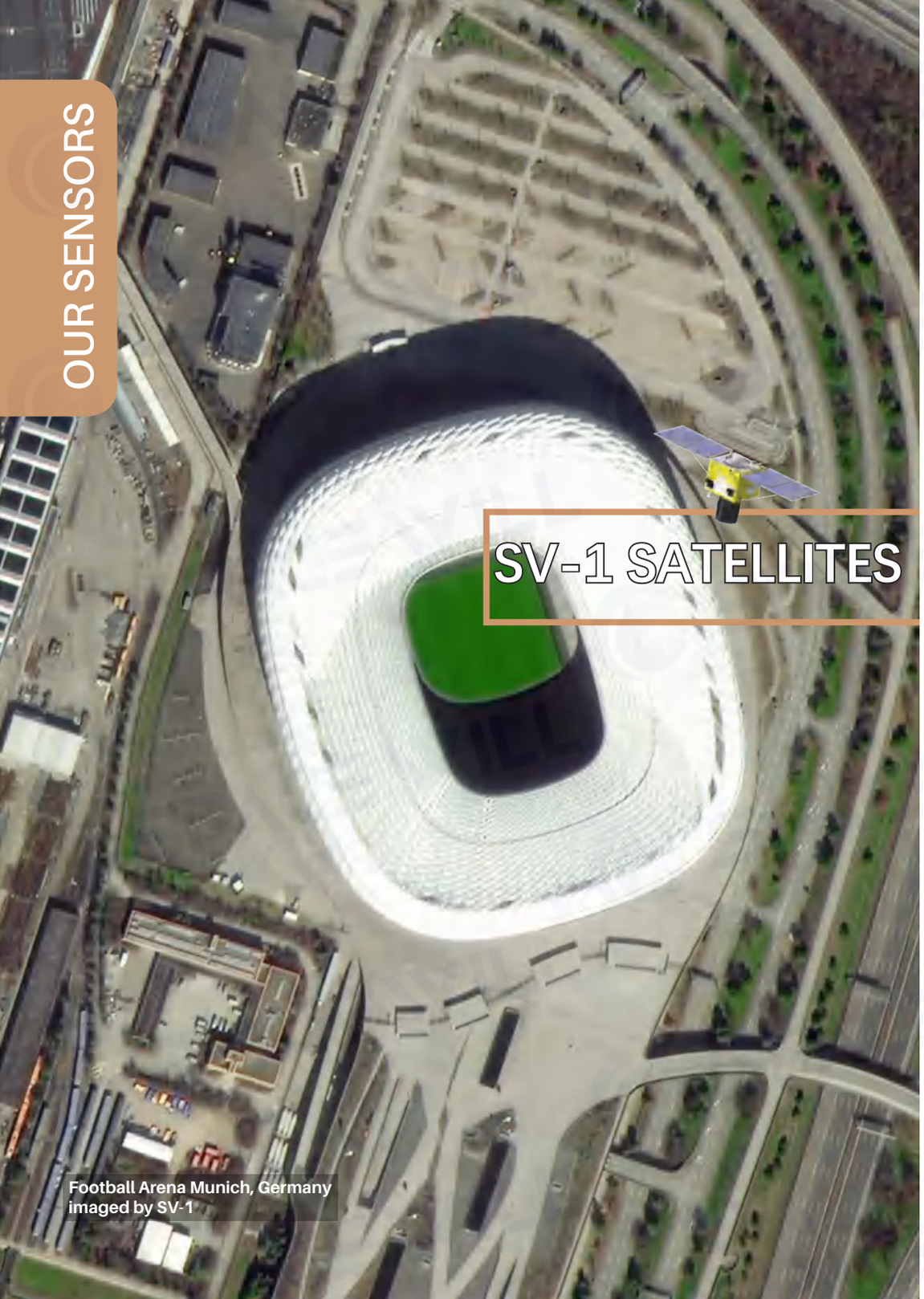
SUPERVIEW-2 SATELLITE

42 cm Resolution, 6 MS Bands, Stereo Imaging, High Agility

SV-2 (short for SuperView-2, alias GFDM, 高分多模) is a follow-on satellite of SV-1 satellite constellation. It is a very-high-resolution optical imaging satellite. Compared with SV-1 satellites, SV-2 provides higher resolution and more spectral bands. The satellite has one panchromatic band and six multispectral bands. The panchromatic resolution is 42 cm and the multi-spectral resolution is 1.68 m at nadir. The imagery collection is highly agile, as the satellite allows long-strip, multi-target, multi-angle at one target, multi-strip, bi/tri-stereo, along/not-along track collection in one single pass. The satellite is equipped with a set of synchronous monitoring atmospheric corrector to remove the effects of the atmosphere on the reflectance values of images.

Technical Specifications

Mission life	8 years	
Weight	2400 kg	
Launch time	July 3, 2020	
Orbit	Sun-synchronous, 10:30 am descending node, 643.8 km altitude, 97.96° inclination angle	
Resolution (at nadir)	Panchromatic: 42 cm; multispectral: 1.68 m	
Sensor bands	Panchromatic Blue Green Red	Red edge Near-infrared1 Near-infrared2
Swath width (at nadir)	15 km	
Dynamic range at imaging	12 bits	
Revisit capacity	1.5 days 30° off nadir	
Imaging modes	Long-strip, multi-target, multi-angle at one target, multi-strip, bi/tri-stereo, along/not-along track collection in one single pass	
Onboard storage	⩾ 5 Tb	



Football Arena Munich, Germany imaged by SV-1

SUPERVIEW-1 SATELLITE

4 Satellites, 50 cm Resolution, 4 MS bands, Stereo Imaging, Agility

SV-1(short for SuperView-1) constellation is composed of four identical satellites. The foursome team provide global coverage of Earth surface with their very-high-resolution, panchromatic and multispectral cameras. SV-1 is the first commercial Chinese optical satellite constellation with 50 cm resolution. The two pairs of SV-1 were successively launched on December 28, 2016 and January 9, 2018. The quadruplets work along the same orbital plane and revisit at any place on our planet on a daily base. SV-1 sensor consists of 5 spectral bands with each of the four satellites being totally identical to another. The raw resolution of satellite data is 50 cm for panchromatic band and 2 m for blue, green, red and near-infrared (multispectral) bands. The image swath width is 12 km at nadir pass. 2 million square kilometer's imagery can be collected on each day.

Technical Specifications

Number of Satellites	4 identical satellites: SV-1A, SV-1B, SV-1C and SV-1D
Mission life	8 years
Weight	560 kg
Launch time	SV-1A&B: Dec. 28, 2016; SV-1C&D: Jan. 9, 2018
Orbit	Sun-synchronous, 10:30 am descending node, 530 km altitude, 97.489° inclination angle
Sensor bands	Panchromatic, blue, green, red and near-infrared
Resolution (at nadir)	Panchromatic: 50 cm, multi-spectral: 2 m
Dynamic range at imaging	11 bits
Swath width	12 km
Revisit capacity	Daily
Imaging modes	Long strip, multi-target , multi-strip and stereo collection in one single pass
Imaging capacity	2 million km² daily by constellation

Debris and Structural Damage Massively in Mayfield, Kentucky, USA imaged by GF-7

GAOFEN-7 SATELLITE

65 cm Resolution, Bi-stereoscopic, Optical, Laser Altimeter

GF-7 (short for Gaofen-7) was launched on November 3, 2019. It is a very high-resolution optical imaging satellite, and collects bi-stereoscopic and panchromatic-multispectral imagery. It is also equipped one laser altimeter. The satellite collects overlap images and enables 1:10,000-scale stereoscopic mapping. Its laser altimeter provides great supports in mapping difficult geographic terrains. The satellite mainly applies in monitoring land resources, basic mapping, and investigating globally geographic features.

Technical Specifications

Mission life	8 years
Weight	2800 kg
Launch time	November. 3, 2019
Orbit	Sun-synchronous, 10:30 am descending node, 506 km altitude
Sensor bands	Panchromatic, blue, green, red and near-infrared
Resolution (at nadir)	Panchromatic: 80 cm (front camera), 65 cm (rear camera); multi-spectral: 2.6 m (rear camera)
Locational accuracy	20 m CE90 (w/o GCPs)
Dynamic range at imaging	11 bits
Swath width (at nadir)	20 km (at nadir)
Revisit capacity	5 days

Cleanup of Arecibo Observatory Telescope, Puerto Rico, USA imaged by GF-2

GAOFEN-2 SATELLITE

80 cm Resolution, 45 km Swath, Optical

GF-2(short for GaoFen-2) was launched on August 19, 2014. It is a very high-resolution optical imaging satellite with 80 cm panchromatic and 3.2 m multi-spectral resolution. It is equipped two identical cameras. The combined swath width of one pass at nadir is wider than 45 km. The imagery has been widely used for governmental services, marine monitoring, precision agriculture and forestry, emergency management, education and research.

Technical Specifications

Mission life	8 years
Weight	2100 kg
Launch time	August 19, 2014
Orbit	Sun-synchronous, 10:30 am descending node, 631 km altitude
Sensor bands	Panchromatic, blue, green, red and near-infrared
Resolution (at nadir)	Panchromatic: 80 cm, multi-spectral: 3.2 m
Locational accuracy	50 m CE90 (w/o GCPs)
Dynamic range at imaging	10 bits
Swath width (at nadir)	45 km
Revisit capacity	Less than 5 days 23° off nadir

GF-1 SATELLITES

Beijing Capital International Airport, Beijing imaged by GF-1

GAOFEN-1 SATELLITES

4 Satellites, 2 m Resolution, Optical

GF-1 (short for GaoFen-1) constellation is composed of 4 satellites. GF-1 is equipped with two 2 m panchromatic and 8 m multispectral cameras (PMC), and four wide-field imagers (WFI) with 16 m multispectral resolution and a combined swath of 800 km. The satellite allows the collection in PMC and WFI modes both simultaneously and separately. GF-1B, C and D are single-camera sensors, collecting 2 m panchromatic and 8 m multispectral resolution data. When the four satellites work as a constellation, they provide massive collection efficiently, cover the whole planet only for 11 days, and revisit at any place on the Earth on a daily base.

Technical Specifications

Number of Satellites	4 satellites: GF-1, GF-1B, GF-1C and GF-1D		
	GF-1		**GF-1B, C/D**
Mission life	8 years		
Weight	1060 kg		795 kg/satellite
Launch time	April 26, 2013		March 31, 2018
Orbit	Sun-synchronous, 10:30 am descending node, 645 km altitude, 98.0506° inclination angle		
	2 x PM Camera (PMC)	4 x Wide Field Imager (WFI)	PM Camera (PMC)
Sensor bands	Panchromatic, blue, green, red and near-infrared	Blue, green, red and near-infrared	Panchromatic, blue, green,red and near-infrared
Resolution (at nadir)	Panchromatic: 2 m, multi-spectral: 8 m	16 m	Panchromatic: 2 m, multi-spetral: 8 m
Locational accuracy	50 m CE90 (w/o GCPs)		30 m CE90 (w/o GCPs)
Swath width (at nadir)	60 km	800 km	60 km
Revisit capacity	4 days		2 days

GF-6 SATELLITE

Potash Lake, Lopnur, Taklimakan in Xinjiang, China imaged by GF-6

GAOFEN-6 SATELLITE

Large Swath, 8-band for WFI, Optical, Teamworking with GF-1 Constellation, HR

GF-6 (short for GaoFen-6) is equipped with two cameras, one is high-resolution camera with 2 m panchromatic and 8 m multispectral resolution, the other is a wide-field imager (WFI), collecting 16 m multispectral imagery. The WFI has a large view field, providing the swath of 860 km, and it is agriculture- & forest-oriented with its 8 multispectral bands. GF-6 teams with four GF-1 satellites, collecting huge amounts of data.

Technical Specifications

Mission life	8 years	
Weight	1064 kg	
Launch time	Jun 2, 2018	
Orbit	Sun-synchronous, 10:30 am descending node, 645 km altitude, 98° inclination angle	
	PM Camera (PMC)	**Wide-field Imager (WFI)**
Sensor bands	Panchromatic, blue, green, red, near-infrared	Panchromatic, blue, green, red, near-infrared, red-edge 1, red-edge 2, coastal blue and yellow
Resolution (at nadir)	Panchromatic: 2 m, multi-spectral: 8 m	Multi-spectral: 16 m
Locational accuracy	50m CE90 (w/o GCPs)	
Dynamic range at imaging	12 bit	
Swath width (at nadir)	95 km	860 km
Revisit capacity	4 days	

ZY-3 SATELLITES

Downtown of St. Petersburg, Russia imaged by ZY-3

ZIYUAN-3 SATELLITES

Hyperspectral, IRS, 8 MS bands, HR

ZY-3 (short for ZiYuan-3) constellation is composed of three tri-camera satellites. ZY-3 was launched on January 9, 2012, its panchromatic resolution of nadir-, front- and rear-camera are 2.1 m, 3.6 m and 3.6 m, and the multispectral resolution is 5.8 m. The imaging nadir swath width is wider than 50 km, and stereo imaging nadir swath width is wider than 45 km. It has been in operation over 8 years. ZY-3 02 was launched on May 30, 2016. ZY-3 03 was launched on July 25, 2020, it is equipped with a laser altimeter. When the three work as a constellation, they shorten the repeat circle from 59 days to 15 days and revisit rate from 3 days to daily, and enable 3 times imaging swath width. The main mission of the constellation is to collecting tri-stereoscopic and multispectral imagery applied in 1:50,000 scale mapping, 1:25,000 scale or higher updating and correcting maps. The products include imagery data, DSM, DEM, DLG, DRG, and customized products according to user's requirements.

Technical Specifications

Number of satellites	3 identical satellites: ZY-3, ZY-3 02 and ZY-3 03		
	ZY-3	**ZY-3 02**	**ZY-3 03**
Mission life	5 years		
Weight	2630 kg	2700 kg	2500 kg
Launch time	January 9, 2012	May 30, 2016	July 25, 2020
Orbit	Sun-synchronous, 10:30 am descending node, 505 km altitude, 97.421° inclination angle		
Sensor bands	Panchromatic, blue, green, red and near-infrared		
Resolution (at nadir)	Panchromatic: 2.1 m (nadir), 3.6 m (Front/Rear); Multispectral: 5.8 m	Panchromatic: 2.1 m (nadir), 2.5 m (Front/Rear);Multispectral: 5.8 m	Panchromatic: 2.1 m (nadir), 2.5 m(Front/Rear); Multispectral: 5.8 m
Dynamic range at imaging	10 bits		
Swath width (at nadir)	Mono: 50 km; stereo: 45 km		
Revisit capacity	5 days per satellite, 3 days bi-satellite, daily tri-satellite		

Durrat Al Bahrain, Bahrain imaged by ZY-1 02D

ZY-1 02 SATELLITES

ZIYUAN-1 02 SATELLITES

Hyperspectral, IRS, 8 MS bands, HR

ZY-1 02 (short for ZiYuan-1 02) is composed of two satellites that are almost identical. ZY-1 02D (also named ZY1E) was launched on September 12, 2019. It is equipped with two cameras, one is VNIR camera and the other is hyperspectral camera. The VNIR camera has eight multispectral bands, and it has a large view field, with 115 km swath width. The hyperspectral camera has 166 bands. Its follow-on satellite ZY-1 02E (ZY1F) was launched on December 26, 2021, apart from VNIR and hyperspectral cameras, it is also equipped IRS camera that collect 15 m resolution infrared-spectral data. The two satellites provide great supports in investigating land resources, emergent monitoring and supervising services.

Technical Specifications

Number of satellites	2 satellites: ZY-1 02D and ZY-1 02E		
Mission life	5 years		
Weight	1840 kg		
Launch time	ZY-1 02D: September 12, 2019; ZY-1 02E: December 26, 2021		
Orbit	Sun-synchronous, 10:30 am descending node, 778 km altitude, 98.5° inclination angle		
	Visible Near Infrared Camera	**Hyperspectral Camera**	**IRS Camera (ZY-1 02E only)**
Sensor bands	Panchromatic, Blue, Green, Red, NIR1 Coastal Blue, Yellow Red Edge, NIR2	Spectral Range: 0.4 μm ~ 2.5 μm VNIR: 76 bands SWIR: 90 bands	Spectral Range: 7.7 μm ~ 10.5 μm
Resolution (at nadir)	Panchromatic: 2.5 m Multispectral: 10 m	30 m	15 m
Locational accuracy	50 m CE90 (w/o GCPs)		
Dynamic range at imaging	12 bits		
Swath width (at nadir)	115 km	60 km	115 km
Onboard storage	2 Tb		
Revisit capacity	5 days		

GAOFEN-4 SATELLITE

GEO Orbit, Optical, Regional Observation, Rapid Revisit

GF-4 (short for GaoFen-4) is a geosynchronous orbit remote sensing satellite and equipped with a staring camera provided with VNIR and MWIR bands. It observes China and the surrounding area by pointing control. The satellite provides fast, reliable and stable optical data to support disaster response, forestry, earthquake and meteorology applications, and supplements an advanced technology for alerting natural disasters, monitoring wild fires or typhoons.

Technical Specifications

Mission life	8 years	
Launch time	Dec 29, 2015	
Orbit	36,000 km altitude, geosynchronous, fixed point location: 105.6° E	
	VNIR	**MWIR**
Sensor bands	Panchromatic, blue, green, red and near-infrared	MWIR
Resolution (at nadir)	50 m CE90 (w/o GCPs)	400 m CE90 (w/o GCPs)
Dynamic range at imaging	16 bits	16 bits
Imaging modes	Focal, mobile,large-area and regional viewing	Focal, mobile, large-area and regional viewing
Coverage/shot	500 x 500 km²	400 x 400 km²
Revisit capacity	Minute-class	Second-class

Dabusun Lake, Qinghai Province, China imaged by GF-4

HJ-1A&B SATELLITES

Archived Data Coverage of Land Surface of Whole Earth

Launched on 6 September 2008, HJ-1 is composed of 2 optical satellites HJ-1A and HJ-1B, HJ-1A is equipped with 1 CCD camera and 1 hyperspectral imager, and HJ-1B is equipped with 1 CCD camera and 1 infrared camera. The 2 CCD cameras adopt the same design, and placed symmetrically at nadir and split the field of view and observe in parallel and realize imagery of 700 km swath, 30 m resolution and 4 spectral bands. The hyperspectral imager enables HJ-1A 50 km swath, 100m resolution and 110~128 bands and ±30° oblique viewing angle. The infrared camera enables HJ-1B 720 km swath, 150/300 m resolution and 4 spectral bands.

Technical Specifications

Number of satellites	2 satellites: HJ-1A and HJ-1B			
Launch time	September 6, 2008			
Mission life	3 years			
Orbit	Sun-synchronous, 10:30 am, descending node, 649 km altitude, 97.95° inclination angle			
	HJ-1A		**HJ-1B**	
Operational	Operational		Retired	
Cameras	2 x CCD	Hyperspetral	2 x CCD	Infared MS
Resolution	30 m	100 m	30 m	150 m
Sensor bands	Blue, green, red and near-infrared	110th-128th bands	Blue, green, red and near-infrared	Red-edge 1, red-edge2, coastal blue and yellow
Swath Width (at nadir)	700 km	50 km	700 km	720 km
Dynamic range at imaging	8 bits	12 bits	8 bits	10 bits
Revisit capacity	4 days	4 days	4 days	4 days

GF-3 SATELLITES

Kansai International Airport, Japan
imaged by GF-3

GAOFEN-3 SATELLITES

3 Satellites, SAR, 1 m Resolution, 12 Modes, Full Polarization, C-band

GF-3 (short for Gaofen-3) is composed of three satellites. The satellite is equipped a multi-polarized C-band Synthetic Aperture (SAR) at meter-level resolution. Its Imaging modes include spot mode, strip-map mode, and scan mode. GF-3 was launched on August 10, 2016, it is the first Chinese high-resolution SAR satellite to acquire multi-polarized SAR image with resolution of 1-500 m, and the imaging swath is 10-650 km depending on the varied imaging modes. GF-3 02 and 03 were successively launched on November 23, 2021, and April 7, 2022, they are GF-3's follow-on satellites and provided with very close parameters. The three satellites work as a constellation, doubling the collection and enhancing the revisit capacity.

Technical Specifications

Number of satellites	3 satellites: GF-3, GF-3 02 and GF-3 03									
Mission life	8 years									
Weight	2800 kg									
Launch time	GF-3: August 10, 2016; GF-3 02: November 23, 2021; GF-3 03: April 7, 2022									
Orbit	631 km altitude, Sun-synchronous reapeat orbit, equatorial passing time 6:00 am (descending pass), 6:00 pm (ascending pass)									
Centre frequency	5.4GHz (C-band)									
Polarization	Single, dual and full									
Revisit capacity	Single look: ⩽ 5 days; double look, 10 m resolution and 100 km swath: 1.5 days (single satellite)									
Imaging Range	South latitude 5° ~North latitude 53° , East longitude 70° ~West longitude 150°									
Imaging modes	**Spotlight (SL)**	**Ultra fine strip (UFS)**	**Fine strip 1 (FS 1)**	**Fine strip 2 (FS 2)**	**Standard strip (SS)**	**Full polarized strip 1**	**Full polarized strip 2**	**Narrow scan (NSC)**	**Wide scan (WSC)**	**Global observation scan**
Resolution (at nadir)	1 m	3 m	5 m	10 m	25 m	8 m	25 m	50 m	100 m	500 m
Swath width (at nadir)	10*10 km²	30 km	50 km	100 km	130 km	30 km	40 km	300 km	500 km	650 km
Incidence angle	20° - 50°	20° -50°	19° -50°	19° -50°	17° -50°	20° -41°	20° -38°	17° -50°	17° -50°	17° -53°

DATA RECEIVING SOLUTIONS

SpaceWill provides two satellite data receiving solutions. One is Directly Receiving Station (short as DRS), and the other is Virtual Receiving Station (short as VRS). The DRS consists of a set of sub-products designed for satellite data from the reception to production. The VRS helps the users to get the satellite data rapidly by cable/cloud/internet.

Features & Advantages

Direct Receiving Station

- Actual station built in your specified place, composing of antenna system, control unit, receiving terminal, processing terminal, network equipment and documentation;
- Functioning as receiving data, processing data, receiving data needs, planning tasks, managing data, delivering data and controlling tasks;
- Fastest delivery, suitable for rapidly-demand tasks;
- After the user submits the demand, the instruction can be placed within 2 hours at the earliest, and the data reception can be completed within 3 hours;
- Data cost is considerably lower compared with standard images purchased from distributors or satellites operators.

Virtual Receiving Station

- Your data to be received and processed in our direct receiving stations;
- Functioning as receiving data needs, planning tasks, managing data, delivering data and controlling tasks;
- Delivering data by cable, clouds and Internet;
- Stable and fast delivery, suitable for scheduled monitoring and mapping needs;
- Allowing browsing and ordering achieved data. The delivery can be completed within 1 hour at the fastest;
- Allowing ordering new collection. The delivery can be completed within 6 hours at the fastest.

Mobile DRS

Data storage

DRS's Key Specifications

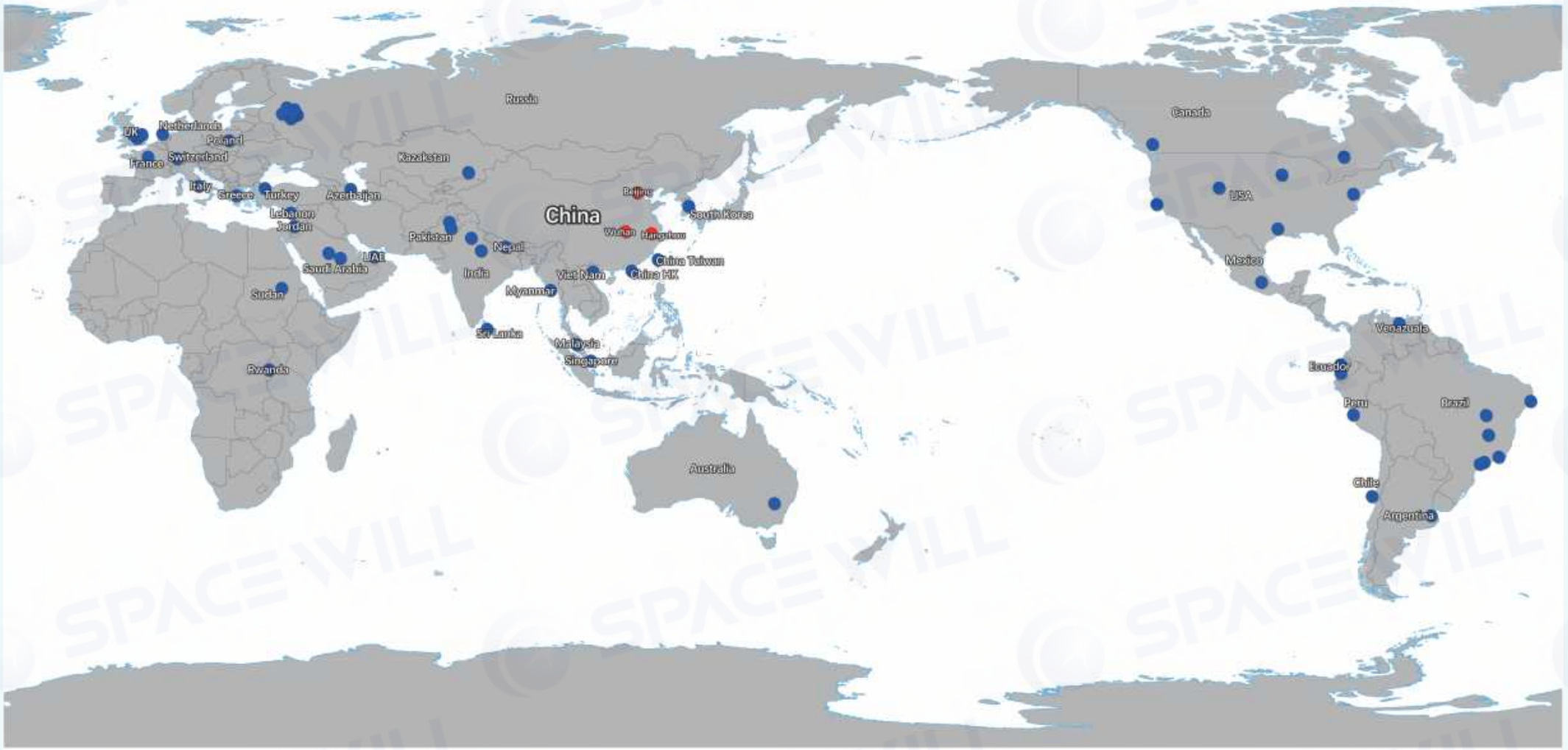
Antenna	
Frequency Bands	X Band: 7950-8950 MHz S Band Telemetry Receiving:2200-2300 MHz S Band Telecontrol: 2025-2120 MHz Ka Band: 18.0-20.0 GHz
Antenna Dish Diameter	2.4 m / 4.5 m / 7.3 m / 12 m
Acquisition and Tracking Capability	Stable tracking and receiving (Elevation: 5° / 10°)
Bit Error Rate	Better than $1x10^{-7}$
Data Receiving Rate	10 Mbps – 1.5 Gbps (continouslyl adjustable)
Transmission Rate	2 X 450 Mbps / 2×900 Mbps / 1×450 Mbps / 1×900 Mbps
Data Cabinet	
Dimension	42U / 21U
Data Storage	⩾ 40TB
Energy Consumption	20,000 W
Network Speed Rate	GB/TB
Working Voltage	220V
UPS	1 set / cabinet

Global Services

We have built direct receiving stations in Europe, Southeast, South America and Africa, the data receiving covers over 40 million square kilometers of lands and seas.

GLOBAL PARTNERS

SpaceWill's expanding network of partners covers Asia, Europe, America Africa and Oceania. We are dedicated to understanding our customers' specific needs through our global distributors and providing them with quality products and services.



HONORS & QUALIFICATIONS

China A-class Mapping Qualification

China High-tech Enterprise

Member of China's Top 100 GIS Companies

Member of CAGIS

WSBW's Newcomer EO Satellite Operator 2018

Trademark Certified by EUIPO

Certificate of GB/ T 19001-2016/ISO 9001:2015

Certificate of GB/ T22080-2016/ISO/ IEC27001:2013

Certificate of GB/ T 24001-2016/ISO 14001:2015

Thank-you Letter from Lao People's Democratic Republic

KEY USERS

EMSA

Netherlands Space Office

e-geos

Baidu 百度

高德地图

KSAT

GEO GROUP ON EARTH OBSERVATIONS

SOAR