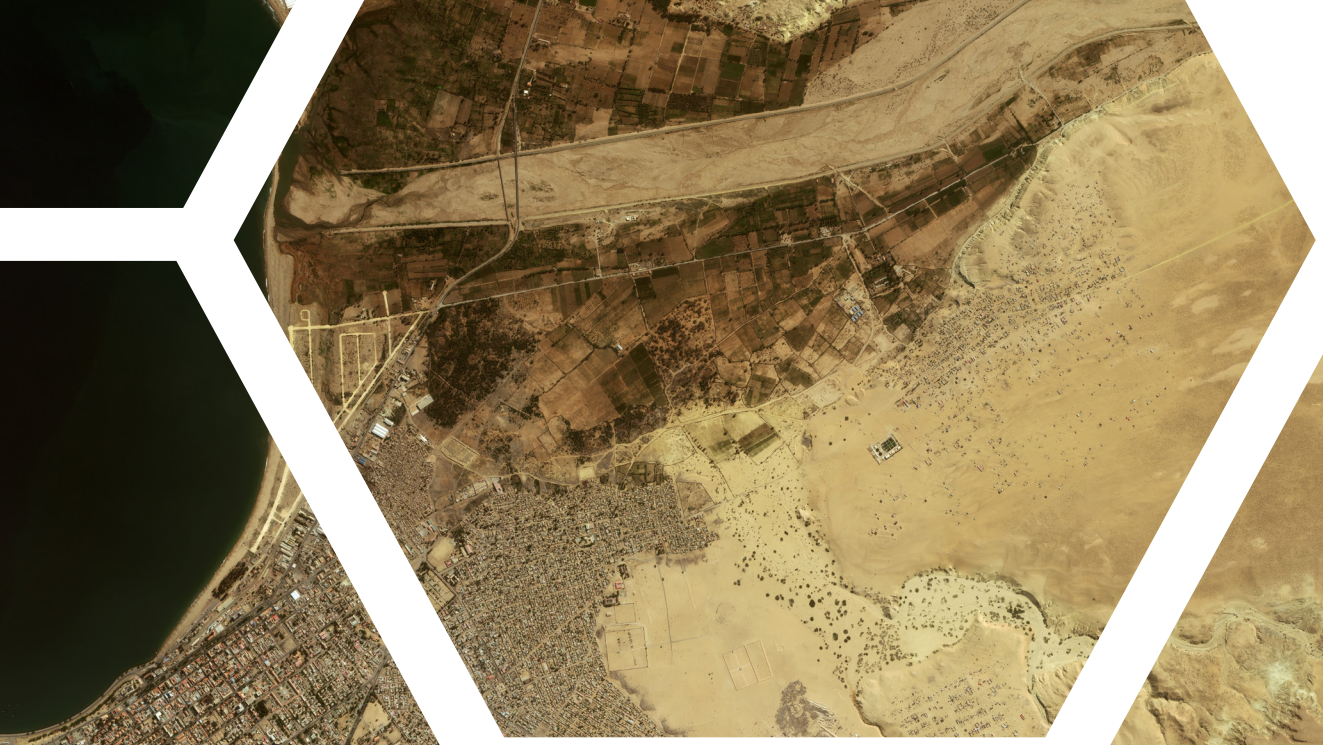
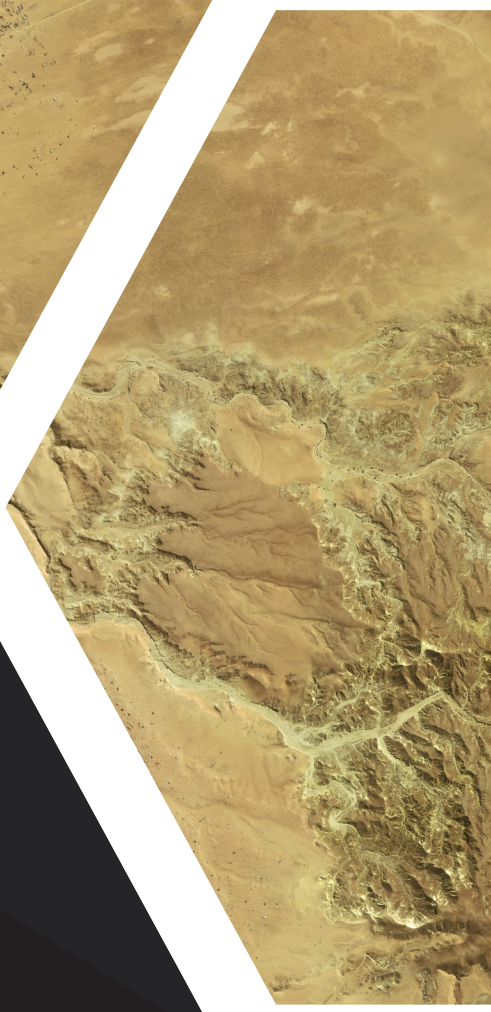




EARTH OBSERVATION

TECHNICAL BROCHURE

ONYX SPACE

WWW.ONYX-SPACE.NET

EARTHSCANNER | 0.5M | 2022 | THE REBUBLIC OF THE MALDIVES

CONTENTS

EARTHSCANNER | 0.5M | 2020 |RAMA BRIDGE, INDIAN OCEAN

ALL IN ONE SOLUTIONS

OnyX offers all-in-one solutions with integrated access from multiple Earth observation (EO) satellite constellations to complex turnkey geospatial solutions. A global network of more than **120 partners accesses the centralized geodata hub of satellite imagery collected from 98 in-orbit satellites.**

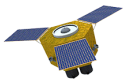
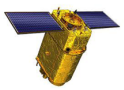
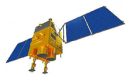
ONLY WITH ONYX

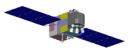
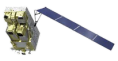
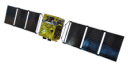
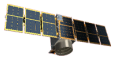
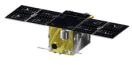
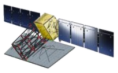
Our strategic partnerships with Chinese satellite operators enable us to supply satellite imagery all over the globe. These industry-leading satellites provide enormous capacity and monitoring capabilities thanks to frequent revisit times from the ever-growing number of sensors. A **revisit capacity of 15 minutes is possible with our submeter resolution optical satellites, 72 with image resolutions ranging from 0.3m to 1m. We also provide tri-stereo imaging, true-color night imaging, hyperspectral, video, C-Band, and L-Band SAR.** Our portfolio of satellites is constantly expanding and will reach +200 satellites by 2025.

ONYX GLOBALLY

OnyX has representation globally, with local employees on each continent. Our team speaks native or fluent **Arabic, Afrikaans, Chinese (Cantonese & Mandarin), Dutch, English, French, German, Portuguese, and Spanish.**

98 SATELLITE PORTFOLIO

	SUBMETER OPTICAL								OPTICAL HR
									
	15-30 CM	30 CM	40-50 CM	50 CM	65 CM	75 CM		80CM	
	BJ3B	SUPERLANCE	SV/TJ/BJ	EARTHSCANNER	GAOFEN-7 STEREO	DAILYVISION	DAILYVISION WIDE	GAOFEN-2	NIGHTVISION & VIDEO
SATS	1	1	7	4	1	54	4	1	3
GSD	0.30m PAN 1.2m MS OPTION: SUPER RESAMPLING AT 15cm	0.30m PAN 1.2m MS	SV2: 0.40m PAN 1.6m MS SV1/TJ3/ BJ3A: 0.50m PAN 2m MS	0.50m PAN 2m MS	0.65m PAN 2.6m MS	0.75m PAN 3m MS	0.75m PAN 3m MS	0.80m PAN 3.2m MS	1.2m
STEREO	✓	X	✓	X	✓	X	✓	X	X
SWATH	24 km	15 km	12 km (SV1/TJ3) 15 km (SV2) 24 km (BJ3A)	150 km	20 km	18 km	40 km	50 km	19 km
REVISIT	5 DAYS	5 DAYS	2 DAYS	2 DAYS	5 DAYS	18 TIMES/DAY	2 DAYS	5 DAYS	3 DAYS
	SUPER RESAMPLING AT 15CM			150 KM SWATH		18X PER DAY REVISIT			
	73 VERY HIGH RESOLUTION SUBMETER SATELLITES								

OPTICAL MR			HYPERSPECTRAL		C-BAND SAR		X-BAND SAR		L-BAND SAR
									
NATUREYE	ZY3 TRI-STEREO	HYPERSCAN	GAOFEN-5	ZY1 HYPERSPECTRAL	GAOFEN-3 SAR	C-SAT-2 & CSAT-3 SAR	SUPERVIEW SAR	TAIJING-4	LT1
5	3	2	1	2	3	2	2	1	2
2m PAN 8m MS	2.1m PAN 3.5 MS	3m RGB bands	30m 320 bands inc. SWIR	2,5m/10m/30m 166 Bands inc. SWIR	Up to 1m	Up to 1m	0.5m 2m	1m 3m	Up to 3m
X	✔	X	X	X	X	X	X	X	X
60 km	51 km	110 km	60 km	60 km	10-650 km	5-170 km	10-20 km	25 km	50-400 km
DAILY	3 DAYS	2 DAYS	5 DAYS	3 DAYS	3 DAYS	2-3 DAYS	2 DAYS	4 DAYS	4 DAYS

15-30 CM

BJ3B

Launch	2022
Orbit	Altitude: 500 km Type: Sun-synchronous
Sensor bands	Pan: 0.45um - 0.70 um B1/Blue: 0.45 - 0.52 um B2/Green: 0.52 - 0.59 um B3/Red: 0.63 - 0.69 um B4/NIR: 0.7 - 0.89 um
Ground Sampling Distance	PAN (nadir): 0.30 m MS (nadir): 1.2 m ***Option: Super resampling 0.15m***
Dynamic range	12 bits
Swath width	24 km
Onboard storage	6TB
Revisit time	3 days
Positional Accuracy (CE90)	<8.5 m
Off-pointing angle	± 45°
Imaging Mode	strip, multi strip, point target, stereo

30 CM

SUPERLANCE

Launch	2022
Orbit	Altitude: 535.35 km Type: Sun-synchronous
Sensor bands	Panchromatic: 450 nm~700 nm 4 multispectral: Blue: 430nm~520nm Green: 520nm~610nm Red: 610nm~690nm Near-IR: 770nm~900 nm
Ground Sampling Distance	PAN (nadir): 0.30 m MS (nadir): 1.2 m
Dynamic range	12 bits
Swath width	15 km
Onboard storage	14TB
Revisit time	5 days
Positional Accuracy (CE90)	<8.5 m
Off-pointing angle	± 45°
Imaging Mode	push broom imaging

40 CM

SUPERVIEW-2

Launch	SuperView-2 launched July 2020
Orbit	Altitude: 643.8 km Type: Sun-synchronous Period: 97 minutes Descending node time at 10:30am
Design life	8 years
Mass	2400 kg
Sensor bands	Panchromatic 6 Multispectral bands: RBG, NIR
Ground Sampling Distance	PAN: 0.42 m MS: 1.60 m
Dynamic range	12 bits
Swath width	15 km
Onboard storage	5 TB
Revisit time	2 Days
Positioning accuracy	<8.5 m (CE90)
Data transmission	2 * 800 Mbps
Daily Capacity	850,000 km²

✔ SuperView: One 0.4m and four 0.5m GSD agile satellites for stereo imaging, urban mapping and monitoring

50 CM

STEREO IMAGING

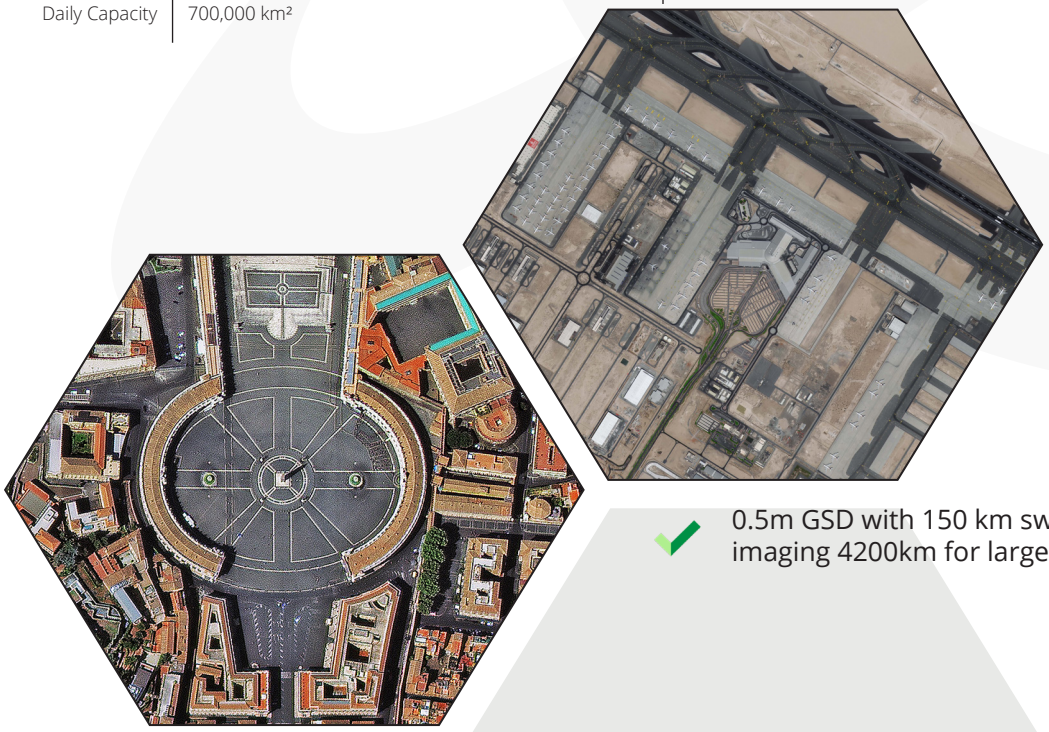
SUPERVIEW-1 CONSTELLATION

Launch	SuperView-1-1/1-2 launched December 2016 Superview -1-3/1-3 launched January 2018
Orbit	Altitude: 530 km
	Type: Sun-synchronous
	Period: 97 minutes Descending node time at 10:30am
Design life	8 years
Mass	560 kg
Sensor bands	Panchromatic
	4 Multispectral: RGB, NIR
Ground Sampling Distance	PAN: 0.5 m
	MS: 2 m (4 bands)
Dynamic range	11 bits
Swath width	12 km
Onboard storage	2.0 TB
Revisit time	Daily with 4 satellites
Positioning accuracy	<8.5 m (CE90)
Data transmission	2 * 450 Mbps
Daily Capacity	700,000 km²

50 CM

EARTHSCANNER

Launch	2020-2023
Weight	1.25 T
Orbit	Altitude: 481 km
	Type: Sun-synchronous
Sensor bands	Panchromatic: 450-800nm
	4 multispectral: Blue: 450-510 nm Green: 510-580 nm Red: 630-690 nm
	Near-IR: 770-895 nm
Ground Sampling Distance	PAN (nadir): 0.50 m MS (nadir): 2.00 m
Dynamic range	12 bits
Swath width	150 km
Onboard storage	16TB
Revisit time	1-2 Days
GEO location	<8.5m (CE90)
Off-pointing angle	± 45°
Imaging Mode	push broom imaging



✔ 0.5m GSD with 150 km swath capable of continuous imaging 4200km for large-area coverage

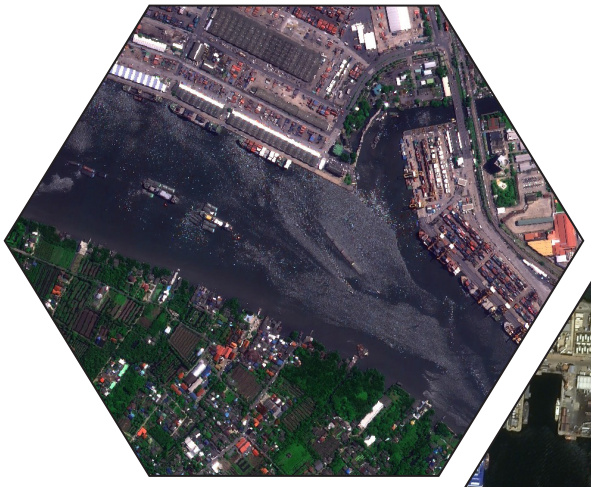
65 CM

STEREO IMAGING

GAOFEN-7 STEREO

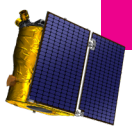
Launch	November 2019
Weight	2400 kg
Orbit	Altitude: 506 km Type: Sun-synchronous
Ground Sampling Distance	PAN (nadir): 0.65 m FWD / BWD (forward and backward viewing): 0.8m
Sensor bands	MS: 2.6 m 4 Multispectral: RGB, NIR
Swath width	20 km
GEO location	<8 m (CE90)
Spatial range	P: 0.45-0.90 B1: 0.45-0.52 B2: 0.52-0.59 B3: 063-0.69 B4: 0.77-0.8
Onboard storage	4 TB
Revisit time	Within 5 days

GF-7: Dual Camera stereo imaging for 1:10,000 mapping



75 CM

HIGH REVISIT

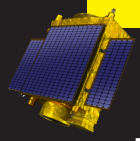


DAILYVISION

Launch	2019-2023
Orbit	Altitude: 535 km Type: sun-synchronous orbit
Sensor bands	Panchromatic: 450-700nm 4 multispectral: Blue: 450-510 nm Green: 510-580 nm Red: 630-690 nm Near-IR: 770-895 nm
Ground Sampling Distance	PAN (nadir): 0.75m MS (nadir): 3m
Dynamic range	12 bits
Swath width	18 km
Onboard storage	400GB
Revisit time	15 times/day
GEO location	<8 m (CE90)
Off-pointing angle	± 45°
Imaging Mode	push broom imaging, multiple target push broom imaging

Every 15 minutes targeting capability anywhere from 9:00 am to 12:30 pm

1.2M **VIDEO**



NIGHTVISION & VIDEO CONSTELLATION

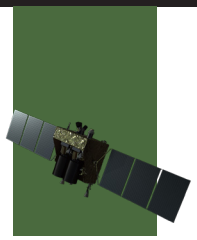
Launch	2020
Weight	210 KG
Orbit	Altitude: 535 km
	Type: Sun-synchronous
Sensor bands	Video Mode: RGB
Ground Sampling Distance	1.2m Color Video 1.2m (night-time images)
Dynamic range	8 bits
Swath width	11 km*4.5 km
Revisit time	Three times per day
GEO location	<8.5m (CE90)
Off-pointing angle	± 45°

NIGHT & VIDEO

- 1.2 m resolution of day/nighttime images and video captures

HIGH RESOLUTION (HR)

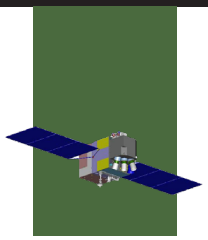
NATUREYE
GF-1/GF-6



Launch	GF-1, 2013 & 2018	
Orbit	Altitude: 645 km	
	Type: Sun-synchronous	
Design life	8 years	
Sensor bands	2 * PMC	4 * WFI
	Panchromatic: 450-900 nm	
	4 Multispectral: RGB, NIR	4 Multispectral: RGB, NIR
Ground Sampling Distance	(GF-1 b,c,d) PAN (nadir): 2 m MS (nadir): 8 m	(GF-1 a) PAN: 2 m MS: 16 m
Dynamic range	10 bits	
Swath width	60 km with 2 cams (nadir)	830 km with 4 cams (nadir)
Revisit time	Daily	

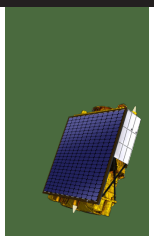
Orbit	Altitude: 634 km
	Type: Sun-synchronous
Design life	8 years
	High-resolution camera
Ground Sampling Distance	PAN (nadir): 2 m, MS (nadir): 16 m
Spectral bands	PAN: 450-900 nm
	4 Multispectral: RGB, NIR
Swath width	90 km
Revisit time	4 days
	Wide-format camera
Ground Sampling Distance	MS: 16 m
Spectral bands	Multispectral: RGB, NIR Red-edge band 1:450-520 nm Red-edge band 2:520-590 nm
Swath width	850 km
Revisit time	4 days

ZY TRI-STEREO
ZY-3 01/02/03

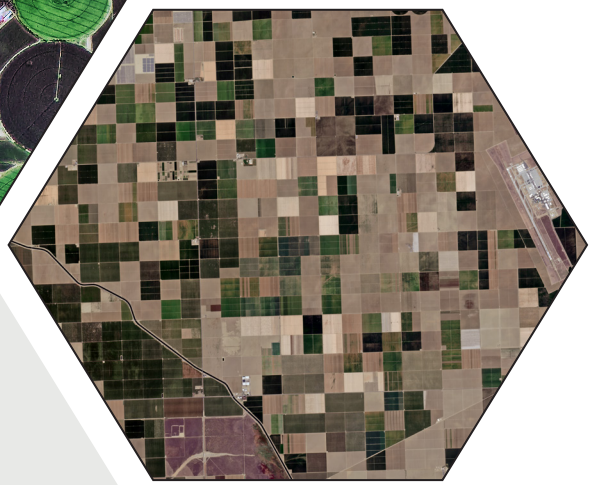


Launch	ZY-3-01 launched January 2012 ZY-3-02 launched in 2016 ZY-3-03 launched 2020
Orbit	Altitude: 509 km
	Type: Sun-synchronous
Design life	5 years
Sensor bands	Panchromatic: 500-800 nm
	4 Multispectral: RGB, NIR
Ground Sampling Distance	Vertical viewing: 2.1 m
	Front/Rear Viewing: 3.5 m (ZY-3 01), 2.5 m (ZY-3 02)
	MS cam: 5.8 m
Dynamic range	10 bits
Swath width	Vertical viewing cam: 51 km
	Front/Rear viewing cam: 52 km; MS cam: 51 km
Onboard storage	3.75TB
Revisit time	5 days

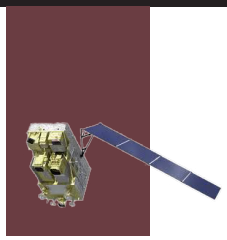
HYPERSCAN



Launch	January 2019
Orbit	Altitude: 528 km
	Type: Sun-synchronous
Design life	>5 years
Sensor bands	B0-B19: 450-1040nm
	SW1:1195-1225nm; SW2:1360-1390nm; SW3:1550-1590nm; SW4:1610-1690nm;
Ground Sampling Distance	B0~B6 (nadir): 5 m; B7~B12 (nadir): 10 m; B13~B19 (nadir): 20 m B3~B5 (nadir): 3 m
	SW1~SW4,
Dynamic range	B0~B19: 12 bits; SW1~4
Swath width	110 km
Revisit time	2 days
GEO location	<8.5m (CE90)
Off-pointing angle	± 45°
Imaging mode	push broom imaging

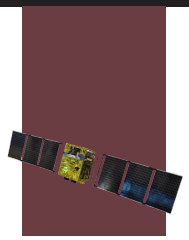


GAOFEN-5
GF05-02



Launch	September 7, 2021
Orbit	Altitude: 705 km Type: sun synchronous Period: 98.723 minutes vertexes position: 105.6°E
Design life	8 years
Advanced Hyperspectral Imager (AHSI)	Swath width: 60 km Spatial Resolution: 30 m Spectral resolution: VNIR: 5 nm SWIR: 10 nm
Visual and Infrared Multispectral Sensor (VIMS)	Swath width: 60 km Spatial Resolution: 20m(VIS/SWIR) / 40m (MWIR/LWIR)
Environment Monitoring Instrument (EMI)	Spectral Range: 240-710 nm Resolution: 24km (across the pass) ×13 km (along the pass) Spectral resolution: 0.3nm~0.6 nm
Directional Polarization Camera (DPC)	Spectral Range: 433-920 nm Resolution: better than 3.5 km
Particulate Observing Scanning polarimeter (POSP)	Spectral Range: 370-2290 nm Resolution: better than 10 km
Absorbent Aerosol Detector	Spectral Range: 339-389 nm Resolution: better than 4 km

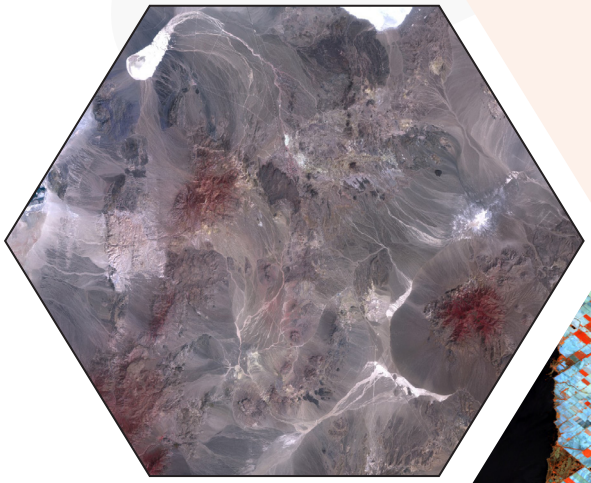
ZY HYPERSPECTRAL
ZY-1 02D/ZY-1 02E

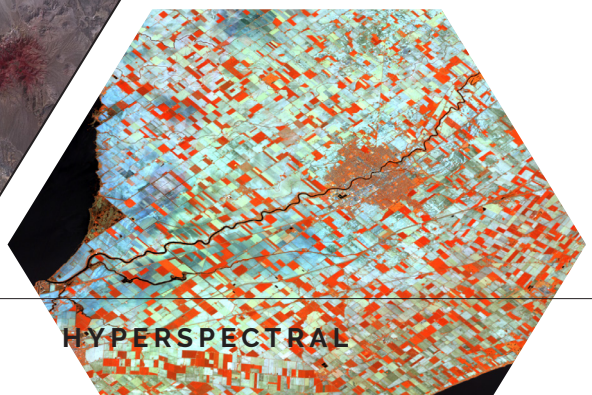


Launch	September 12, 2019 and December 26, 2021		
Orbit	Altitude: 778 km Type: sun-synchronous frozen orbit		
Design life	8 years		
Advanced Hyperspectral Imager (AHSI)	Sensors Band range: 0.4-2.5nm VNIR band channels: 76 SWIR band channels: 90	Spectral resolution: 10 nm 20 nm	Spatial Resolution: 30 m
	Swath width: 60 m		
	Mid-wave infrared: 35000-41000 nm		
MUX camera (VNIC)	PAN: 2.5 m		
	MS: 10 m		
	Swath Width: 115 km		

	ZY-1 02D	ZY-1 02E
P	0.45-0.902	0.447-0.893
B01	0.452-0.521	0.448-0.518
B02	0.522-0.607	0.521-0.589
B03	0.635-0.694	0.632-0.690
B04	0.776-0.895	0.771-0.888
B05	0.416-0.452	0.404-0.453
B06	0.591-0.633	0.595-0.633
B07	0.708-0.752	0.705-0.747
B08	0.871-1.047	0.866-1.050

HYPER SPECTRAL



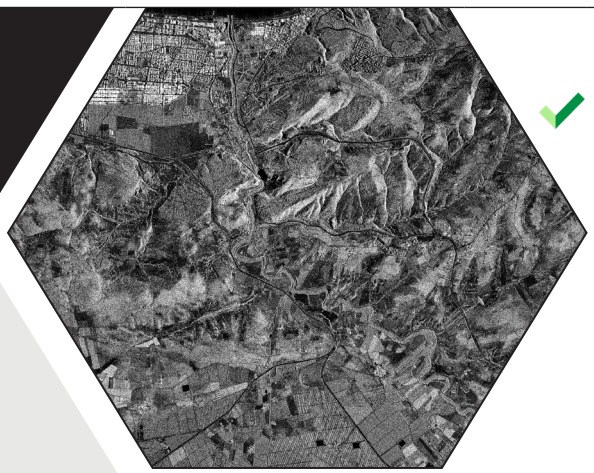


RADAR

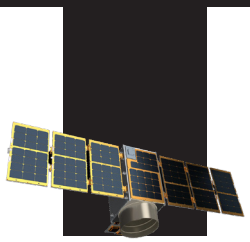
GAOFEN-3

HIGH RESOLUTION C-BAND RADAR GF-3 LAUNCHED IN AUGUST 2016 & NOVEMBER 2021

No.	Image mode		Resolution (meters)			Swath (km)		Number of look(4)	Polarization
			Nominal	Azimuth	Range(1)	Nominal	Range		
1	SL (2)		1	1.0-1.5	0.9-2.5	10*10	≥10*10	1*1	HH VV HV VH
2	UFS		3	3	2.5-5	30	≥30	1*1	HH VV HV VH
3	FSI		5	5	4-6	50	≥50	1*1	(HH HV) (VV VH)
4	FSII		10	10	8-12	100	95-110	1*1	(HH HV) (VV VH)
5	SS		25	25	15*30	130	95-150	1*2	(HH HV) (VV VH)
6	NSC		50	50-60	30-60	300	≥300	2*3	(HH HV) (VV VH)
7	WSC		100	100	50-110	500	≥500	2*4	(HH HV) (VV VH)
8	QPSI		8	8	6-9	30	20-35	1*1	Full
9	QPSII		25	25	15-30	40	35-50	3*2	Full
10	WAV (3)		10	10	8-12	5*5	≥5*5	4*2	Full
11	GLO		500	500	350-700	650	≥650	4*2	(HH HV) (VV VH)
12	EXT	High Incident	25	25	15-30	130	120-150	3*2	(HH HV) (VV VH)
		Low incident	25	25	20-30	80	70-90	3*2	(HH HV) (VV VH)
Dynamic range			8 bits						
BAQ compress			8:3 or 8:4						
Incidence angle range(look range)			20°-50° (Nominal) 10°-20° or 50°-60° (Extended)						
Revisit			3 days (single side-looking) Less than 1.5 days (double side-looking with 10m resolution and 100km swath)						



✔ C-band SAR up to 1m GSD for full weather and day & night imaging

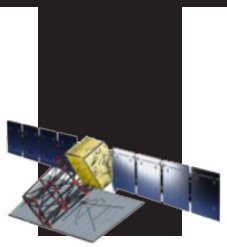


C-SAT-2 & C-SAT-3

HIGH RESOLUTION C-BAND SAR

Parameters	C-SAT-2	C-SAT-3
Orbit	Sun-synchronous orbit	
Satellite mass	185 kg	285 kg
Revisit	15 days	12 days
Ascending node crossing time	12:00 (±25 min)	10:30 (±25 min)
Inclination	97.45°	97.56°
Altitude at the equator	512 km	535 km
Antenna type	Active Phased Array	
Antenna size	4.00 m × 0.64 m	4.56 m × 0.8 m
Center frequency	5.4 GHz, C-band	
Maximum chip bandwidth	300 MHz	
Spatial resolution	Up to 1 m	Up to 0.5 m
Nominal acquisition direction	Both right and left side applicable	
Polarization	VV	

		Spotlight	StripMap	ScanSAR	
BC-1	Standard Scene Size [km]	4.0 x 5.0	20 x 20	**NS** 50 x 50	**ES** 100 x 100
	Maximum acquisition length [km]	/	840		
	Slant Range Resolution [m]	1.0	3.0	10.0	20.0
	Azimuth Resolution [m]	1.0	3.0	10.0	20.0
	Incidence Angle Range [°]	20°~35°			
BC-2					
	Standard Scene Size [km]	7.0 x 7.0	25 x 25	100 x 100	170 x 170
	Maximum acquisition length [km]	/	2100		
	Slant Range Resolution [m]	1.0	3.0	12.0	20.0
	Azimuth Resolution [m]	0.5	3.0	12.0	20.0
	Incidence Angle Range [°]	15°~41°			



LT1

HIGH RESOLUTION L-BAND SAR

Launch	January 30, 2022
Orbit	Altitude: 607.05 km
	Type: sun synchronous
Coverage	85° S – 85°N
Imaging modes	6
Polarization	Full Polarization
Orbit repeat time	8 days for single satellite, 4 days for two
DEM accuracy	1:50000 measurement scale
Orbital determination	10 cm
Baseline accuracy	1.2 cm
Data transfer rate	2×450 Mbps

Imaging Mode	Polarization	Resolution	Swath Width
Stripmap 1	HH or VV	3m	50 km
Stripmap 1	HH or VV	12 m	100 km
Stripmap 1	HH + HV or VV + VH	3 m	50 km
Stripmap 1	HH + HV + VV + VH	6 m	30 km
Stripmap 1	HH or VV	24 m	160 km
ScanSAR	HH or VV	30 m	400 km

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