Resurs-P. Capabilities. Standard Products

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Resurs-P is the Russian remote sensing spacecraftdeveloped by JSC "RSC Progress". The operating organization is the Research Center for Earth Operative Monitoring (JSCRussian Space Systems). It is planned to create the group of threespacecrafts Resurs – P.

The first spacecraft was placed into orbit on

The Sensors

Electrooptical equipment of Geoton - L1 with Sangur - 1 U data-acquisition and conversion system.

Main characteristics:

Focal length, mm	4000
Entrance pupil diameter, mm	500
Aperture	1:8
Fieldofview, deg.	5°18'
Pixel size, µm	
panchromatic	6x6
spectral	18x18
GSD:	
panchromatic, m	1.0
multispectral, m	3.0-4.0
Span width, km	38
Spectral bands, µm:	
panchromatic	0.62-0.79
blue	0.48-0.53
green	0.54-0.59
red	0.62-0.68
red edge	0.72-0.80
NIR	0.81-0.88
Number of simultaneously	1-5
used bands	
Bitperpix	10

Orbit Parameters

Main characteristics:

Туре	Circularsun-synchronous
Height, km	470-480
Inclination, deg.	97.28
Revisit time, days	3

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The spacecraft is designed to update the maps, to support economic activity of MNR of Russia, the Russian Emergency Ministry etc., as well as to receive information for the purpose of control and protection of the environmentand other purposes and consumers.

Hyperspectral sensor

Main characteristics:

Span width, km	30
GSD, m	25-30
Spectral bands, µm	0.4-1.1
Number of bands	more than 96
Spectralresolution, nm	5-10

Complex of wide-span multispectral sensors

Main characteristics:

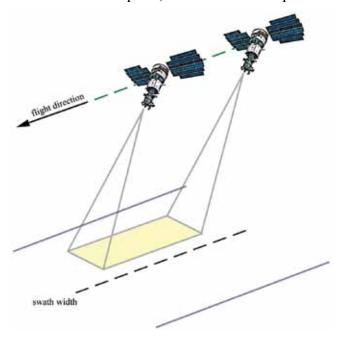
main characteristics.	Va	lues
Characteristics	Medium	High
Characteristics	resolution	resolution
Opticsystem:	resolution	resolution
Focallength, mm	40	200
Aperture	1:4	1:3
Fieldofview, deg.	54°30' 11°70'	
Span width, km	441.7	97.2
GSD:		
panchromatic, m	59	12
spectral, m	118	23.8
Spectral bands, µm:		·
panchromatic	0.43-0.7	
blue	0.43-0.51	
green	0.51-0.58	
red	0.60-0.70	
NIR 1	0.7-0.9	
NIR 2	0.8-0.9	
Pixel size, μm		
panchromatic	5x5	
multispectral	10x10	
bitperpix	12	

Surveying modes

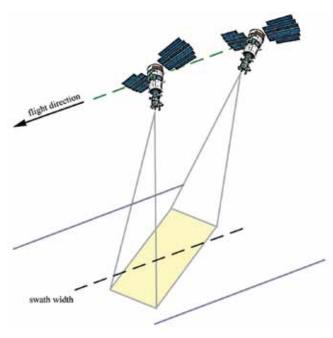
Route surveying

Route surveying can be performed with a constant roll and pitch, as well as with specified

azimuth.Possible spacecraft roll and pitch deviation from the nadir is up to \pm 45 °, by yaw is up to \pm 60 °. Duration of routes is from 2 to 300 seconds.

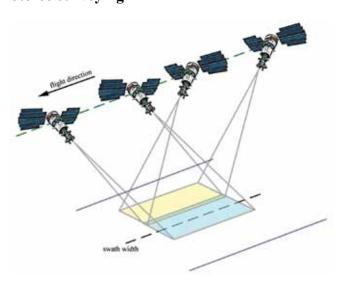


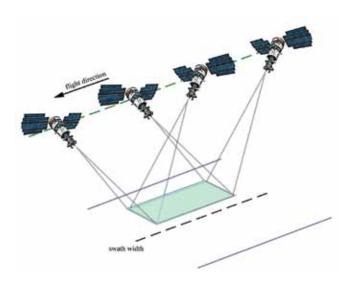
Constant roll and pitch



Specified azimuth

Areal surveying Stereo surveying





Stereoimaging is performed at single turn with a deviation by pitch.

Length of routes is up to 115 km.

Standard products.
Sensor Geoton-L1

		2B level + MSS 2B1 level)	Pansharpened image (PAN 2B level + MSS 2B1 level)	4B 4B
		2A level + MSS 2A1 level)	Pansharpened image (PAN 2A level + MSS 2A1 level)	4A
		Mosaic image of the images 2B1 level.	Mosaic image of the images 2B level.	3B
		Mosaic image of the images 2A1 level.	Mosaic image of the images 2A level.	3A
		RGB image with radiometric and geometric correction, georeferencedtoacartographic projecti on, transformed by using GCP and DTM. Accuracy dependent on the reference data and DTM.		2B1
GCP and DTM. Accura	rtographic projection, transformed by using	Images by bands with radiometric and geometric correction, georeferenced to a cartographic projection, transformed by using GCP and DTM. Accuracy dependent on the reference data and DTM.	Images by bands with radiomet on the reference data and DTM	2B
	on 1	RGB image with radiometric and geometric correction + RPC,georeferenced to a cartographic projection, transformed by the average height, accuracy 30-50 m		2A1
the average height.	l to a cartographic projection, transformed b	Images by bands with radiometric and geometric correction + RPC, georeferenced to a cartographic projection, transformed by the average height. Accuracy 30-50 m.	Images by bands with radion Accuracy 30-50 m.	2A
	on	RGB image with radiometric and geometric correction + RPC		IAI
		$Images\ by\ bands\ with radiometric and geometric correction + RPC.$	Images by bands withradion	1A
NIR GSD3 m, spectralband: 0.81-0.88 μm	Reb bands GSD3 m, spectralbands: 0.66-0.69 μm 0.70-0.75 μm	Multispectral GSD3 m, spectralbands: 0.48-0.53 μm 0.54-0.59 μm 0.62-0.68 μm 0.72-0.80 μm	Panchromatic GSD 1m, spectralband 0.62-0.79 μm	Product level
	-		-	

Wide field multispectral sensor (high resolution)

Inages by bands withradiometricandgeometric correction. RGB image with radiome 2A Images by bands with radiometric and geometric correction, georeferenced to by the average height. Accuracy 50 mforPANand 100 mforMSS. RGB image with radiome georeferenced to a cartog average height accuracy by using GCP and DTM. Accuracy dependent on the reference data and DTM. Accuracy dependent on the reference data and DTM. Accuracy according georeferenced to a cartog GCP and DTM. Accuracy CPP and DTM. Accuracy GCP and GCP an	PanchromaticMultispectralGSD 1m,GSD3 m,spectralband: 0.62-0.79 μmspectralbands: 0.48-0.53 μm0.54-0.59 μm0.62-0.68 μm0.62-0.68 μm0.72-0.80 μm	File format
Images by bands with radiometric and geometric corby the average height. Accuracy 50 mforPANand 100 Images by bands with radiometric and geometric corby using GCP and DTM. Accuracy dependent on the Mosaic image of the images 2A level. Mosaic image of the images 2B level. Pansharpened image (PAN 2A level + MSS 2A1 level bancharpened image (PAN 2A level + MSS 2A1 level bancharpened image (PAN 2D lavel + MSS 2D1 lavel		TIFF, BMP, IMG
Images by bands with radiometric and geometric corby the average height. Accuracy 50 mforPANand 100 Images by bands with radiometric and geometric corby using GCP and DTM. Accuracy dependent on the Mosaic image of the images 2A level. Mosaic image of the images 2B level. Pansharpened image (PAN 2A level + MSS 2A1 level).	RGB image with radiometric and geometric correction.	TIFF, BMP, IMG
Images by bands with radiometric and geometric corby using GCP and DTM. Accuracy dependent on the by using GCP and DTM. Accuracy dependent on the Mosaic image of the images 2A level. Mosaic image of the images 2B level. Pansharpened image (PAN 2A level + MSS 2A1 level bancharpened image (PAN 2D layed + MSS 2A1 level bancharpened image).	metric and geometric correction, georeferenced to a cartographic projection, transformed racy 50 mforPAN and 100 mforMSS.	GeoTIFF, IMG
Images by bands with radiometric and geometric corby using GCP and DTM. Accuracy dependent on the by using GCP and DTM. Accuracy dependent on the Mosaic image of the images 2A level. Mosaic image of the images 2B level. Pansharpened image (PAN 2A level + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS 2A1 level Dancharoned image (PAN 2D layed + MSS	RGB image with radiometric and geometric correction, georeferenced to a cartographic projection, transformed by the average height. accuracy 100 m.	GeoTIFF, IMG
Mosaic image of the images 2A level. Mosaic image of the images 2B level. Pansharpened image (PAN 2A level + MSS 2A1 level	a cartographic projection, transformed	GeoTIFF, IMG
Mosaic image of the images 2A level. Mosaic image of the images 2B level. Pansharpened image (PAN 2A level + MSS 2A1 level to the image (PAN 2A level + MSS 2A level to the image (PAN 2A level to the im	image with radiometric and geometric correction, ferenced to a cartographic projection, transformed by using and DTM. Accuracy dependent on the reference data and	GeoTIFF, IMG
Mosaic image of the images 2B level. Pansharpened image (PAN 2A level + MSS 2A1 level	Mosaic image of the images 2A1 level.	GeoTIFF, IMG
	Mosaic image of the images 2B1 level.	GeoTIFF, IMG
		GeoTIFF, IMG
	Pansharpened image (PAN 2B level + MSS 2B1 level)	GeoTIFF, IMG

Wide field multispectral sensor (high resolution)

GeoTIFF, IMG		Pansharpened image (PAN 2B level + MSS 2B1 level)	4B
GeoTIFF, IMG		Pansharpened image (PAN 2A level + MSS 2A1 level)	4A
GeoTIFF, IMG	Mosaic image of the images 2B1 level.	Mosaic image of the images 2B level.	3B
GeoTIFF, IMG	Mosaic image of the images 2A1 level.	Mosaic image of the images 2A level.	3A
GeoTIFF, IMG	RGB image with radiometric and geometric correction, georeferenced to a cartographic projection, transformed by using GCP and DTM.Accuracy dependent on the reference data and DTM.		2B1
GeoTIFF, IMG	Images by bands with radiometric and geometric correction, georeferenced to a cartographic projection, transformed by using GCP and DTM. Accuracy dependent on the reference data and DTM.	Images by bands with radiometric and geometric correction Accuracy dependent on the reference data and DTM.	2В
GeoTIFF, IMG	RGB image with radiometric and geometric correction, georeferenced to a cartographic projection, transformed by the average height. accuracy200 m.		2A1
GeoTIFF, IMG	on, georeferenced to a cartographic projection, transformed by the average height.	Images by bands with radiometric and geometric correction, georeferenced to a cartographic projection, transf Accuracy100 m for PAN and 200 m for MSS.	2A
TIFF, BMP, IMG	RGB image with radiometric and geometric correction.		1A1
TIFF, BMP, IMG		Images by bands withradiometricandgeometriccorrection.	1A
File format	Multispectral GSD120 m Spectralbands: 0.43-0.51 µm 0.51-0.58 µm 0.60-0.70 µm 0.70-0.90 µm 0.80-0.90 µm	Panchromatic GSD60 m Spectralband: 0.43-0.70 μm	Product level

Hyperspectral sensor

Product level	Surveying by main sensor GSD 30 m Spectral range 0,4-1,1 nm (130 bands)	File format
1A	Hyperspectral image with radiometric and geometric correction, with color value at entrance pupil.	TIF, IMG,BMP,
2A	Hyperspectral image with radiometric and geometric correction, with color value at entrance pupil,georeferenced to a cartographic projection, transformed by the average height. Accuracy100 m.	GeoTIFF, IMG
2B	Hyperspectral image with radiometric and geometric correction, with color value at entrance pupil, georeferenced to a cartographic projection, transformed by using GCP and DTM. Accuracy dependent on the reference data and DTM.	GeoTIFF, IMG