

# RESURS-P

MULTI-PURPOSE SPACE COMPLEX  
OF ELECTRO-OPTICAL EARTH OBSERVATION



STATE SPACE CORPORATION "ROSCOSMOS"



JSC "RESEARCH INSTITUTE OF PRECISION INSTRUMENTS"



JSC "SPACE ROCKET CENTRE PROGRESS"



JSC "RUSSIAN SPACE SYSTEMS"



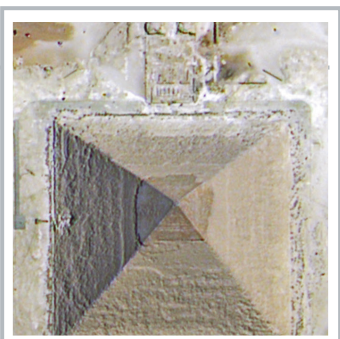
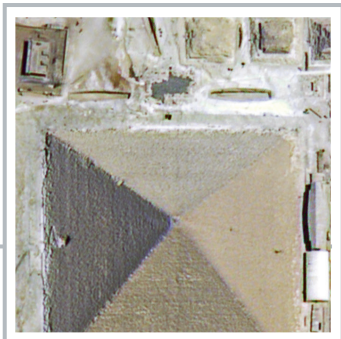
JSC "KRASNOGORSKY ZAVOD" (KMZ "ZENIT")

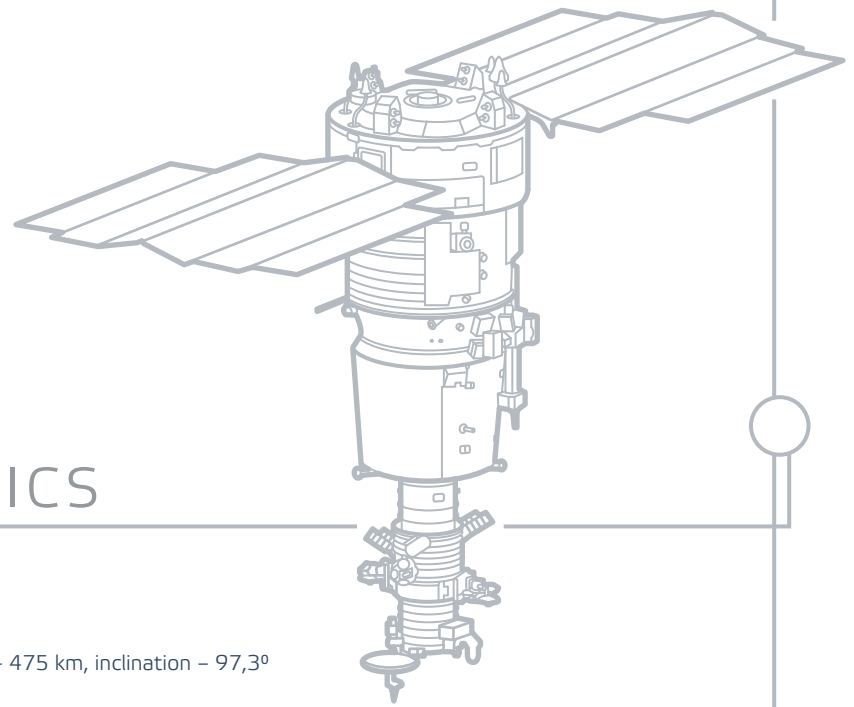


Brussels Airport, Belgium, Resurs-P satellite image

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## » MAIN CHARACTERISTICS

- Latitude range: 80°S – 80°N
- Orbit: circular sun-synchronous, height average – 475 km, inclination – 97,3°
- Revisit period: max. 3 days
- Active operational life span: min. 5 years

### LAUNCH DATE

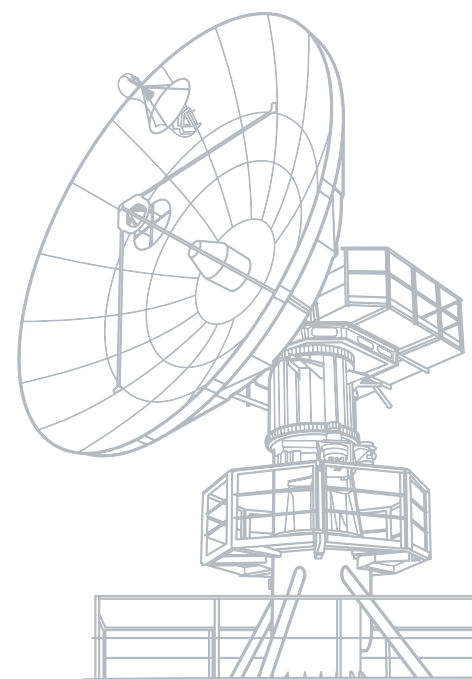
- Resurs-P1 – 25 June, 2013
- Resurs-P2 – 26 December, 2014 (decommissioned)
- Resurs-P3 – 16 March, 2016

### ACQUISITION MODES

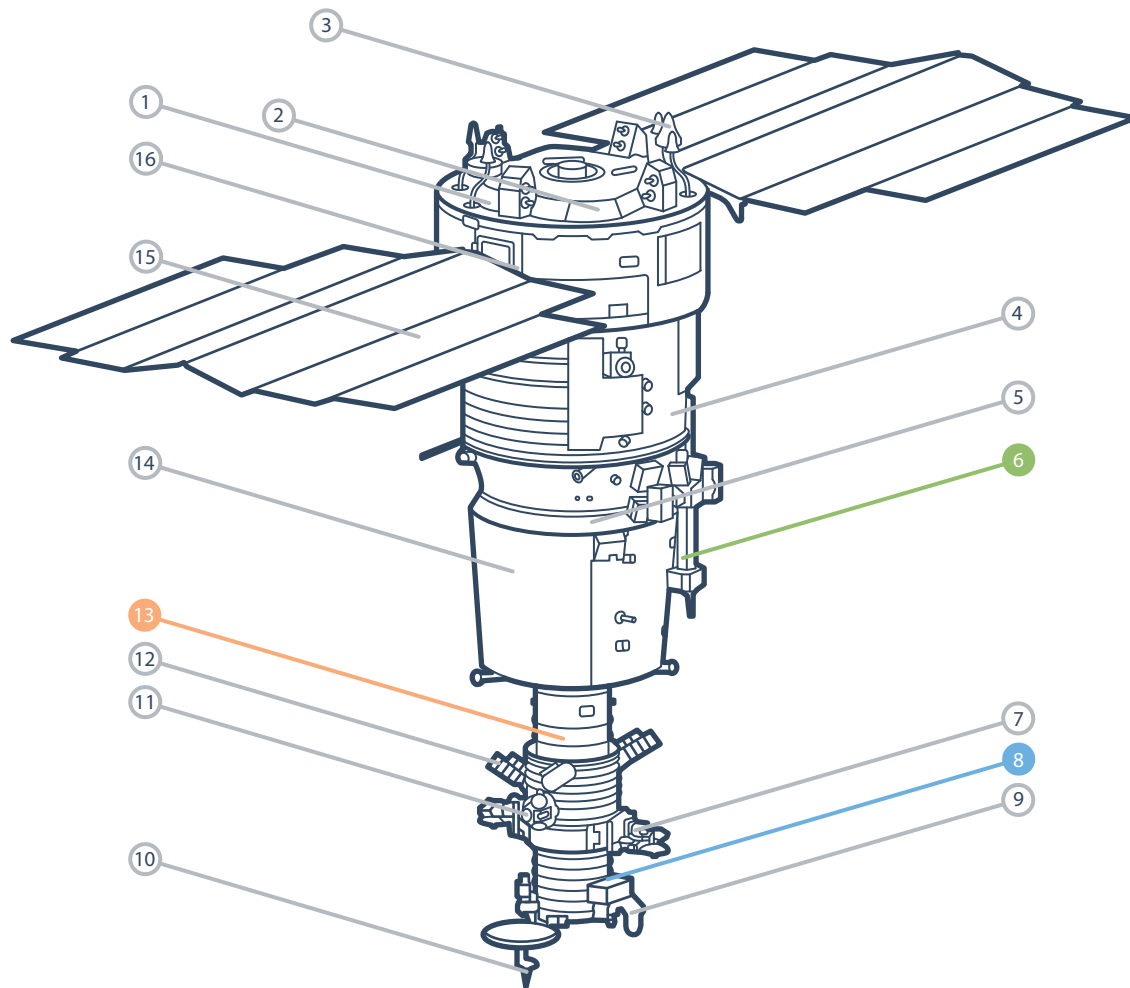
- Object
- Route
- Stereo
- Area

### MISSION PURPOSE

Near real-time acquiring of highly informative data in visible and near infrared spectral range for ecological monitoring, natural resources inventory, mineral exploration, and mapping



## » RESURS-P DESIGN

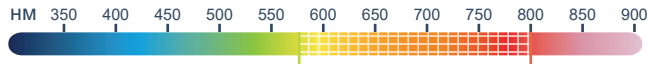


1. Antenna of onboard synchronizing coordinate-time equipment
2. Combined propulsion unit
3. Antenna of command and measurement system
4. Instrument module
5. Sensor module
6. **HYPERSPECTRAL SENSOR (GSA)**
7. High-speed radioline antenna system
8. **WIDE-COVERAGE MULTISPECTRAL SENSOR COMPLEX (SHMSA)**
9. Infrared local vertical builder
10. Antenna of command and measurement system
11. Fiberoptic rotation rate measurement unit with acceleration meters
12. Star coordinates measurement unit
13. **HIGH RESOLUTION OPTICAL-ELECTRONIC SENSOR**
14. Powered gyroscopic complex
15. Solar battery
16. Assembly module

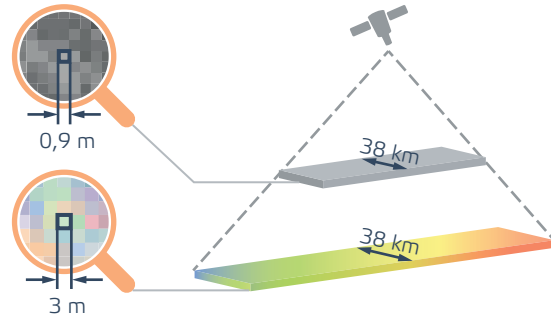
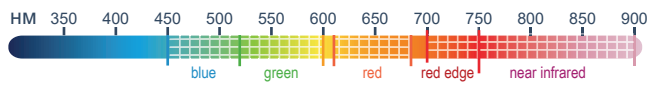
# » ACQUISITION MODES

## HIGH RESOLUTION OPTICAL-ELECTRONIC SENSOR

### PANCHROMATIC MODE

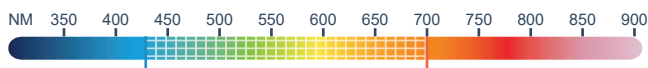


### MULTISPECTRAL MODE

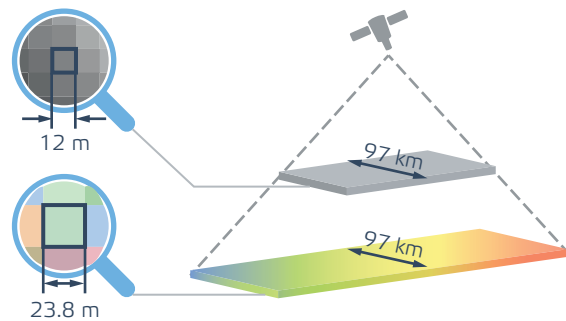
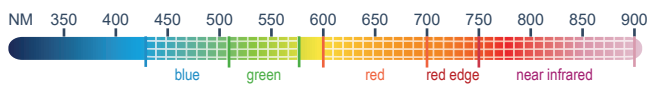


## HIGH RESOLUTION SENSOR (SHMSA-VR)

### PANCHROMATIC MODE

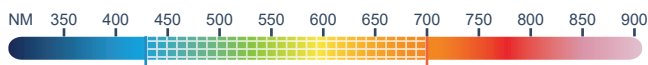


### MULTISPECTRAL MODE

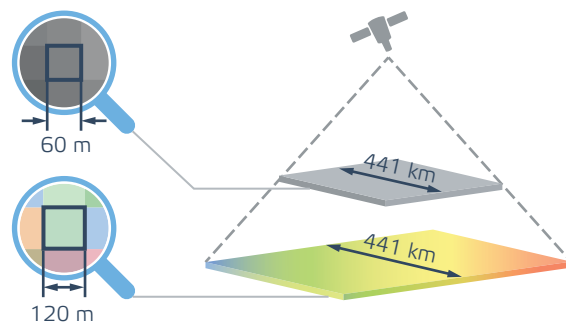
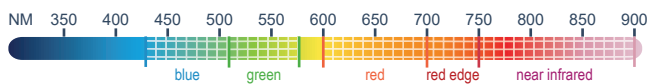


## MEDIUM RESOLUTION SENSOR (SHMSA-SR)

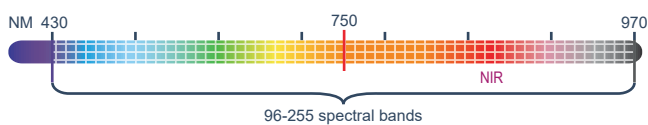
### PANCHROMATIC MODE



### MULTISPECTRAL MODE



## HYPERSPECTRAL SENSOR (GSA)



## » APPLICATION AREAS



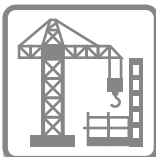
### AGRICULTURE

- Agricultural land inventory, rational use control of agricultural land, revealing of idle land;
- Monitoring of crop condition on different vegetative stages (biomass buildup, degree of wetting), also judgment of seedlings;
- Determination of unauthorized construction zones and unauthorized occupation of agricultural land;
- Resolution of cases concerning land-use



### FOREST MANAGEMENT

- Determination, control and monitoring of unauthorized forest fell;
- Examination and mapping of negative processes which can lead to degradation and destruction of woodlands (influence of pests and diseases, dehydration or over wetting of forests);
- Determination of forest ecosystem degradation areas (burnt spot, failed woodlands, windfall areas, dehydration areas, insect activity, and etc.)



### CONSTRUCTION

- Inventory of existing and projected industrial objects with generation of large-scale thematic maps and plans;
- Information support of planning and surveying for the purposes of construction;
- Monitoring of electricity infrastructure change, water sector, auto and railway infrastructure;
- Dynamic analysis of vegetation over the city area and also valuation of community landscape



### SUBSURFACE RESOURCES MANAGEMENT

- Mineral resources extraction and transport infrastructure monitoring and mapping (including surface mines, open mines, dump pits, trailing dumps);
- Locating illegal sites of resources extraction;
- Eco unfriendly objects detection (including industrial extractive objects, waste management, transport and energy production facilities);
- Oil spills detection in oil extraction and transportation areas



## » APPLICATION AREAS



### MAPPING

- Creating and updating of ground map with scale of 1:25000;
- Creating and updating of ground map with scale of 1:50000;
- Creating and updating of ground map with scale of 1:100000;
- Creating and updating of ground map with scale of 1:200000



### EMERGENCIES

- Applying Earth observation data in complex emergencies prognosis;
- Monitoring all stages of emergencies occurrence, accurate mapping of consequences;
- Short-term prognosis and modelling of occurred emergencies, modelling of floods and wildfires



### ECOLOGY

- Monitoring of existing SPNR;
- Determination of SPNR security violation – forestfell, construction, changes of landscape, dumps;
- Landscape and woodland mapping within SPNR;
- Organization and detailing of existing and constructed SPNR boundaries;
- Monitoring of existing authorized and illegal storage areas of solid domestic waste, factory waste, determination of upcoming dumps (within residential, industrial construction and also buffer zones of main settlements);
- Integrated control of domestic and industrial waste recovery activities



### ICE CONDITIONS

- Control of ice conditions in high latitudes;
- Selection of ship traffic optimal rate;
- Due ice conditions notice