

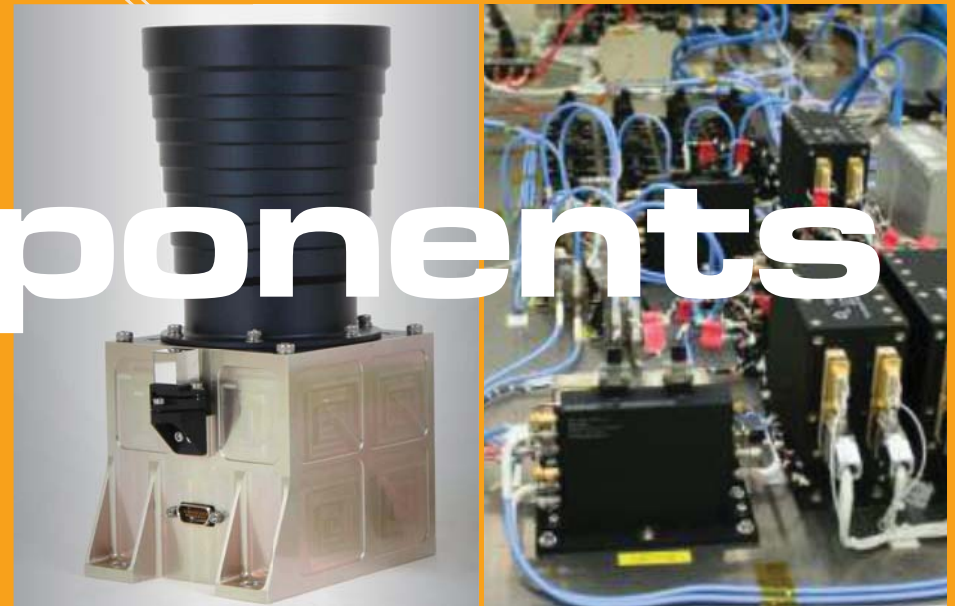
**CHALLENGING  
SPACE SMART**

SPACECRAFT

# Components

## Spacecraft Components

Satrec Initiative (SI) offers a full-line of cost-effective and qualified small satellite components. The line of components currently available includes GPS receivers, magnetometers, magnetic torque drivers/rods, S-band transponders, X-band transmitters, star trackers, and sun sensors. Specifically, SI's satellite attitude control systems are in high demand due to their quality, flight heritage, and affordability. SI also possesses powerful in-house capabilities to design, manufacture, and verify most satellite components.



SpaceWorks  
*Commercial*  
A Division of SpaceWorks Engineering, Inc. (SEI)  
Official U.S. representative of Satrec Initiative

[www.satreci-us.com](http://www.satreci-us.com)



Component	Description
<b>FSS-05 (Fine Sun Sensor)</b>	2-axis solar angle information using four solar cells. <0.5 degrees after calibration.
<b>MAG-30 (Magnetometer)</b>	Flux-gate, three-axis magnetometer. Better than +/- 30 nT accuracy after calibration.
<b>MTD-3 (Magnetic Torque Driver)</b>	Momentum dumping attitude control hardware. Drives 3-axis magnetic coils 128 steps.
<b>MTR-50 (Magnetic Torque Rod)</b>	+/- 20 Am <sup>2</sup> magnetic dipole moment with small hysteresis characteristics.
<b>SST-20S (Star Tracker)</b>	Second generation star tracker, 99% success rate in full sky search. Better 10 arcsec accuracy across the bore-sight direction.
<b>GPS-12 (GPS Receiver)</b>	Receive L1 C/A code from 12 GPS satellites at a time. Provides time, position and velocity information. Accuracy of 1 micro second, +/- 100m fro LEO operations.
<b>STR-384 (S-Band Transceiver)</b>	Includes transmitter, receiver and modem. Downlink of 1200 bps (AFSK), 9600bps (FSK), 38,400 bps (FSK). Uplink 1200 bps (AFSK), 9,600bps (FSK). Doppler frequency tracking capability. Dual redundancies. 2W transmission RF output with phase noise less than -90 dBc/Hz at 10 kHz offset. Reception sensitivity of -105 dBm at 12dB SINAD.
<b>XTX-30 (X-Band Transmitter)</b>	X-band frequency is generated using PLDRO, QPSK modulator with I-Q signal. 30 Mbps data downlink with QPSK modulation in X-Band. 5 W transmission RF output. Dual redundancy.



Based in Daejeon, Republic of Korea (South Korea), Satrec Initiative (SI) is the one of the world's leading companies in high performance Earth observation small satellite solutions. SI was founded in 1999 by engineers who had developed the first South Korean satellite and a series of advanced small satellites at the Korean Advanced Institute of Science and Technology (KAIST). SI has a successful track record serving more than 20 global customers in the Middle East, Asia and Europe. The company's portfolio of high quality satellite solutions includes integrated turnkey satellite systems, satellite components, platforms, electro-optical instruments, ground stations, satellite operations, image processing and image applications, and spin-off technologies. The company also offers training and consultancy services. SI is publicly listed on the South Korean KOSDAQ exchange.



Based in Washington, D.C., SpaceWorks Commercial, a division of SpaceWorks Engineering, Inc. (SEI), advances innovative ideas, solutions, and partnerships aimed at maturing near and far term commercial and international space ventures. The firm works with entrepreneurial ventures to enhance existing or to facilitate new business opportunities as well providing consulting and advocacy services to help bring space projects to maturation. The division's capabilities include: strategic and quantitative-based insight, technical aerospace systems analysis and design services (utilizing its sister division, SpaceWorks Engineering), financial engineering, and space media. SEI is privately held. SpaceWorks Commercial is an official representative of Satrec Initiative's product lines in the United States.



CHALLENGING SPACE SMART