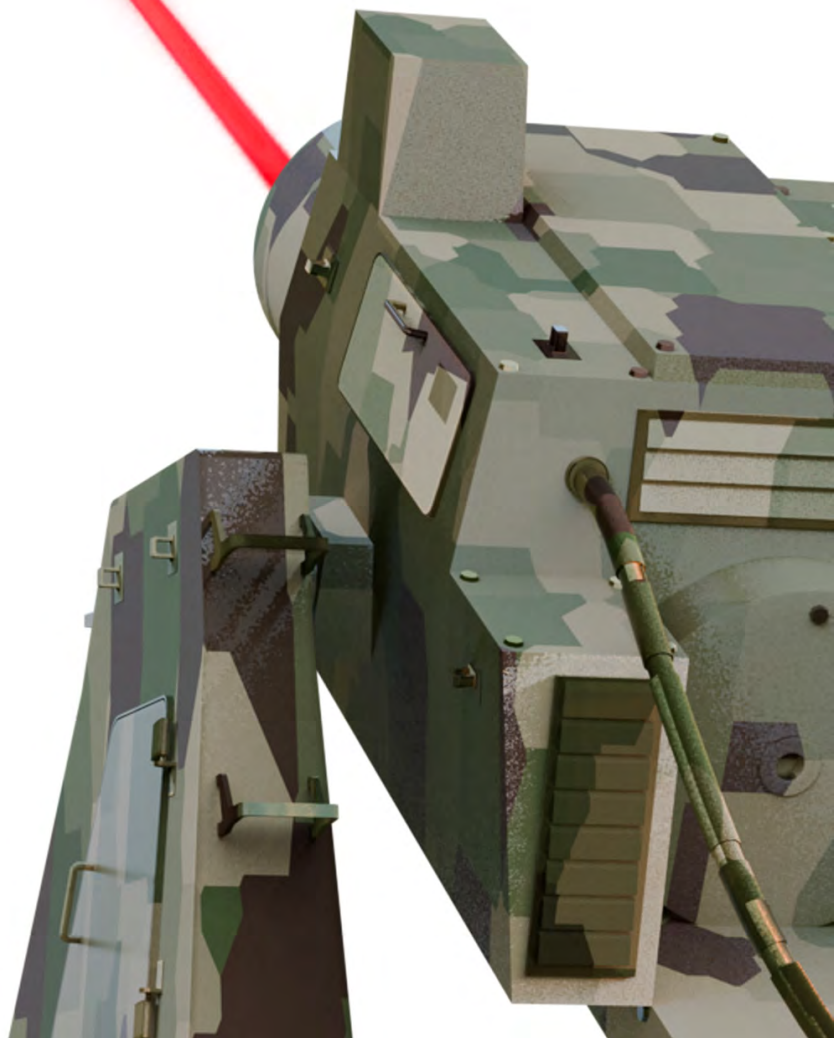


MECHATRONIC SYSTEMS FOR HIGH ENERGY LASER APPLICATIONS



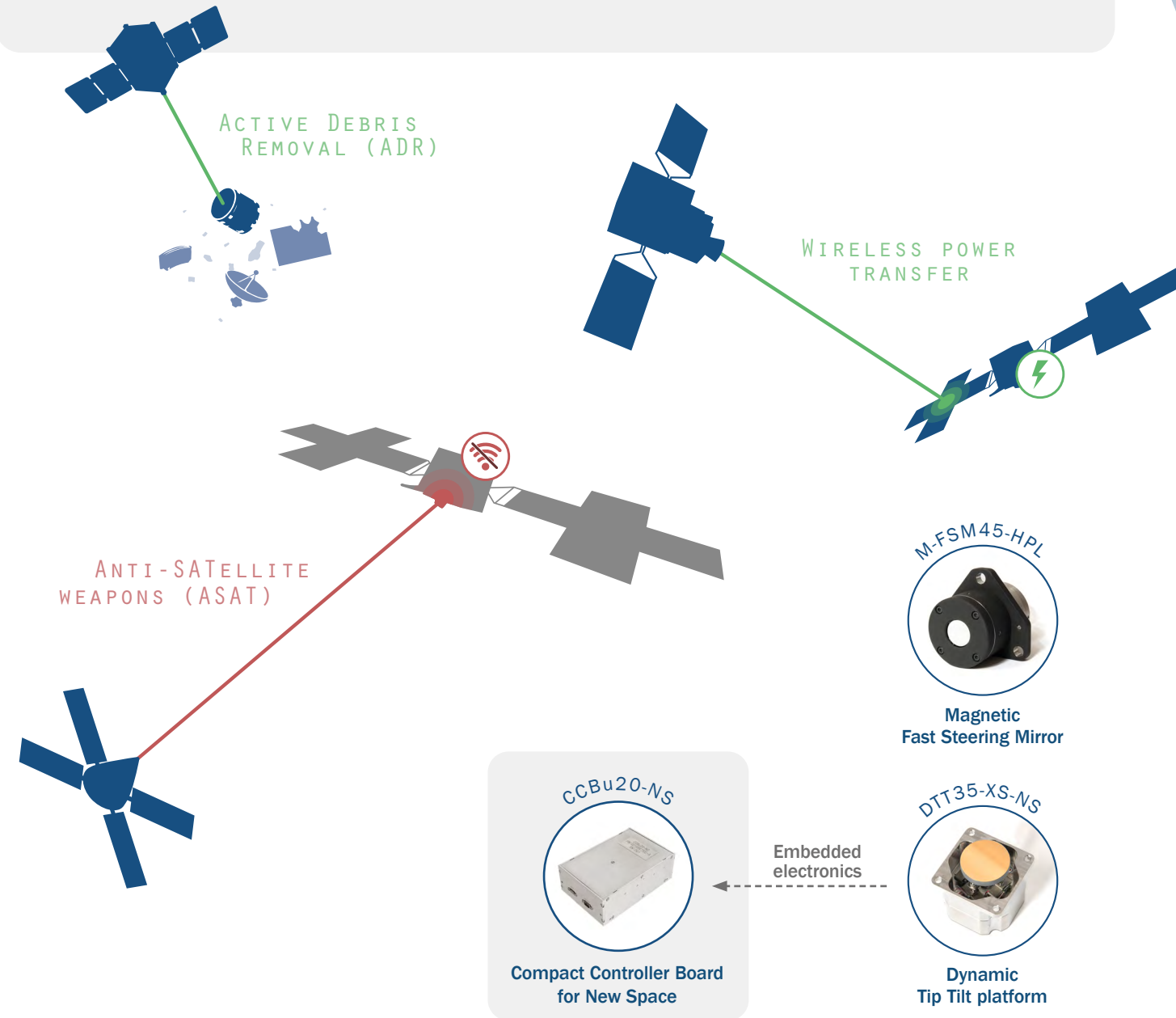
LASER SYSTEMS FOR GROUND APPLICATIONS

Direct Energy Weapons (DEW) use **High Energy Lasers (HEL)** to destroy a target such as a missile, a drone or a satellite. The laser power of such weapons varies from several kW up to 300 kW. To make sure a laser weapon is efficient, the laser beam must heat the targeted area with a focused beam at a constant place. This ensures the targeted material to heat up and ultimately be destroyed. When the laser beam goes through atmospheric turbulences, its mean position can be randomly deviated. This results in the beam power being diluted in a larger area on the target surface, leading to a lower power density.

To compensate this deviation, a **Fast Steering Mirror (FSM)** can be used to stabilize the laser position according to the atmospheric turbulences. CTEC have been delivering several COTS and customised fast-steering platforms for High Energy Laser applications (Direct Energy Weapon or laser welding and cutting). The steering platform is designed according to the mirror substrate and optical performances required in the laser process and system. Our Fast Steering Mirror solutions, based on different platform designs, welcome either glass or silicon carbide mirror substrates. These FSM are controlled by CTEC driving electronics, according to dynamic specifications.



FOR A COMPLETE SOLUTION, CEDRAT TECHNOLOGIES CAN INTEGRATE CUSTOM **MIRRORS**, USING SILICON CARBIDE (SiC), OR OTHER SUBSTRATES AND HIGH-REFLECTIVITY DIELECTRIC COATINGS FOR HIGH-POWER APPLICATIONS.



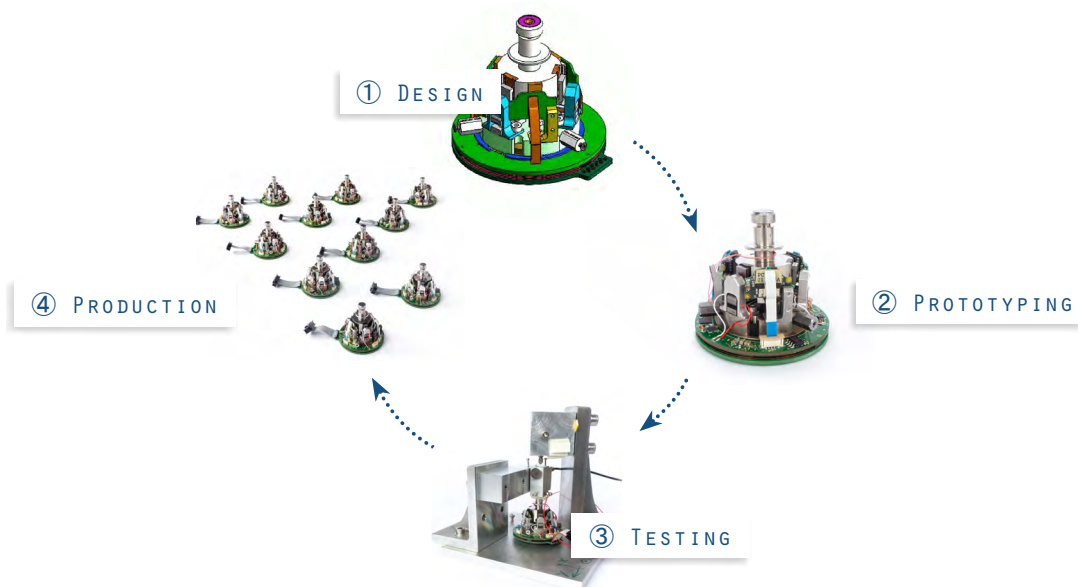
LASER SYSTEMS FOR SPACE APPLICATIONS

Active Debris Removal (ADR), **Anti-SATellite (ASAT)** systems, **satellite deorbiting**, and **wireless power transfer** are driving the development of high-energy laser technologies for space. Laser ablation can generate a small recoil force that gradually lowers the orbit of a defunct satellite until atmospheric re-entry, while optical power beaming enables satellites to wirelessly transfer energy to other spacecraft, extending mission lifetime and supporting power-intensive payloads. These applications require extremely accurate beam pointing and stabilization over long distances. CTEC's Fast Steering Mirrors and high-dynamic piezoelectric actuators provide the precision and responsiveness needed for reliable laser beam steering in demanding space missions.

CEDRAT TECHNOLOGIES offers off-the-shelf mechatronics products including piezoelectric & magnetic actuators, motors, mechanisms, transducers and sensors with corresponding drivers & controllers. These mechatronics products are used for scientific and industrial applications requiring functions such as: micro & nano positioning, generation of vibrations, micro-scanning, fast & precise motion control, active control of vibrations, and energy harvesting...

Most of the products are available in OEM versions for low cost & high volume industrial applications. CEDRAT TECHNOLOGIES also offers services including, design, R&D under contract and training.

FROM DESIGN TO BATCHES



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