Smarter Satellites, Faster Launches:

ARCA Dynamics' Competitive Edge in Low Earth Orbit

ARCA Dynamics accelerated satellite design and reduced production risk to deliver scalable, space-based surveillance solutions with startup agility and enterprise-grade precision.

ARCA Dynamics is a fast-growing space technology company headquartered in Rome, Italy. Founded in 2016 by three aerospace engineering students, the company now employs a multidisciplinary team of engineers, commercial strategists and defense experts. ARCA's clients include major institutional partners such as the US Space Force and the European Union's Space Surveillance and Tracking Program, signalling its growing influence in the New Space economy.

ARCA's core mission is to revolutionize space situational awareness by shifting surveillance and tracking from ground-based systems to space-based platforms. Their proprietary nanosatellite constellation, FALCO-X - comprised of miniature satellites typically weighing less than 10 kilograms - delivers real-time orbital intelligence that protects space-based assets by, helping pinpoint the position and trajectory of satellites and debris in low Earth orbit (LEO). By combining agile engineering with AI-driven onboard processing, ARCA provides high-value insights to both commercial and government customers, enabling smarter space traffic management in an increasingly congested orbital environment.

> "We're not just building satellites. We're building a new way to see space," said Daniele Luchena, CEO and Co-founder at ARCA Dynamics. "Our goal is to make orbital intelligence accessible, actionable, and autonomous."

Challenge: Engineering Excellence Meets Strategic Urgency

The New Space sector is undergoing rapid growth, and ARCA Dynamics is at the forefront, pushing the boundaries of orbital innovation. But building intelligence systems for the harsh environments of space comes with grounded realities. Satellites must not only survive the initial launch environment, they must also remain reliable in orbit, where extreme temperature swings and orbital radiation put intense stress on materials.

Delivering continuous LEO coverage demands precision engineering, rapid iteration, and cost-efficient production. Each satellite must be compact, robust, and capable of running advanced AI algorithms for onboard orbit determination. With no precedent for space-based surveillance at this scale, ARCA is forging a new path - technically, commercially, and operationally.

"Our satellites aren't just passive sensors. They think, decide and adapt in orbit. That level of autonomy requires mechanical systems that are both compact and incredibly reliable," added Luchena. "We're solving problems no one has solved before. That means our engineering tools have to be as flexible and forward-thinking as our team."

To meet rising demand, the company needed to scale its production pipeline without sacrificing quality or agility. That meant managing thousands of components - from cabling to hinges - and ensuring seamless integration across mechanical, electrical, and software systems. Cabling alone posed a major challenge, requiring precise routing in tight spaces and zero tolerance for error.

The pressure to deliver orbital intelligence at scale required ARCA to standardize complex builds without inflating costs, striking a delicate balance between speed and precision. Every subsystem introduced risk, and without tight control, integration failures could derail timelines and budgets. Time-to-market was equally critical. ARCA needed to design, manufacture, and launch on schedule to stay ahead of competing space tech startups and legacy aerospace giants. Without a robust design platform, inefficiencies in prototyping, rework and production threatened more than technical outcomes. They jeopardized the company's strategic momentum and innovative reputation.

"We had to move fast, but we couldn't afford mistakes," said Mariarosa Argenteiro, Chief Commercial Officer. "Our clients expect precision, and our business depends on delivering it without delay."

> **We're solving problems no one has solved before. That means our engineering tools have to be as flexible and forward-thinking as our team.**
>
> **Daniele Luchena, CEO and Co-founder at ARCA Dynamics**

Solution: Designing Nanosatellites for Space Intelligence with Confidence and Speed

To overcome these challenges, ARCA Dynamics selected PTC Creo as its primary design and engineering platform. Creo is a 3D CAD solution that enables precise, scalable design through advanced modeling, simulation and rapid prototyping. It empowers ARCA's engineers to manage highly complex satellite assemblies, including intricate cabling and mobile satellite components, with speed and accuracy. Its flexibility allows the team to experiment with new configurations and iterate rapidly, which is critical for a space startup navigating uncharted technical terrain.

Creo's seamless integration into ARCA's workflow supports fast prototyping and scalable production. Engineers can perform tolerance checks and mechanical evaluations digitally before committing to physical builds, reducing waste and accelerating development cycles. Instead of waiting weeks for aluminum parts, ARCA can 3D print plastic prototypes in-house for just a few euros, validating designs quickly and cost-effectively.

"We can test ideas in hours, not weeks and for less than the cost of a coffee," said Argenteiro. "That's a huge advantage when you're scaling fast."

> **It gives our engineering team the tools to design with precision, iterate quickly, and deliver reliable results without the overhead or delays you'd expect from traditional workflows.**
>
> **Mariarosa Argenteiro, Chief Commercial Officer**

The CAD platform also empowers ARCA to maintain affordability without sacrificing reliability. Creo's cabling tools, in particular, have been instrumental in helping the team visualize and validate routing in 3D - critical when every millimeter counts.

"Creo helps us operate at the same level as much larger aerospace companies," Argenteiro continued. "It gives our engineering team the tools to design with precision, iterate quickly, and deliver reliable results without the overhead or delays you'd expect from traditional workflows. For a startup competing in a high-stakes domain like space surveillance, that kind of parity is essential. It gives us significant technical credibility and assures clients and partners that we can deliver at scale, on time and with confidence."

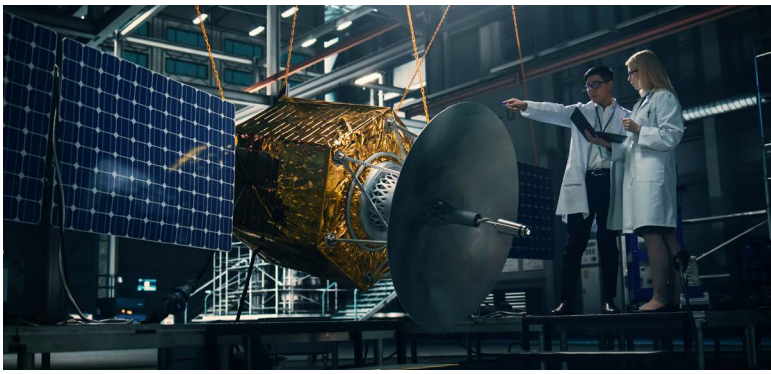
Benefits: From Concept to Orbit - Faster, Smarter, Leaner

By adopting Creo, ARCA Dynamics has dramatically accelerated its design-to-deployment timeline. The ability to iterate quickly and validate designs digitally means satellites move from concept to orbit with speed and confidence. This agility allows ARCA to respond to market needs, refine its offerings, and stay ahead of competitors in the fast-evolving New Space sector.

"Creo has been instrumental in accelerating our development timeline," said Luchena. "It allowed us to define the optimal spatial distribution of satellite subsystems, which mechanically integrated through the design of custom mechanical components, ensuring a fully functional system tailored to our mission requirements. Likewise, the automatic cabling tool and interference analysis features have also proven extremely valuable in streamlining our design process. Creo gives us speed, but also precision. That's what our customers expect from us. Solutions that are fast, reliable and built for the future."

Sustainability is another key advantage. ARCA's approach minimizes material waste and reduces the environmental footprint of satellite production. With Creo, the team can simulate how materials will behave when they're exposed to orbital radiation and thermal cycling and then optimize designs to ensure that each satellite is built right the first time. This efficiency helps ARCA avoid rework while supporting its broader mission of promoting space safety and sustainability.

Perhaps most importantly, Creo enables ARCA to deliver consistent value to its clients. Whether serving defense agencies or commercial operators, the company's satellites provide reliable, actionable intelligence with high-precision orbital data. The



ability to design, manufacture, and launch complex satellite systems with confidence translates directly into mission success, reinforcing ARCA's strong reputation as a trusted partner in space.

"Creo has fundamentally changed the way we design and deliver," said Luchena. "It allows us to move from concept to orbit with speed and confidence, validating designs digitally, minimizing waste, and optimizing every component before it's built. That agility is a significant technical advantage, as well as a strategic one. It means we can respond faster to market needs, reduce our environmental footprint, and consistently deliver high-value intelligence to our clients. Our business is completely dependent upon precision and timing, and Creo helps make that possible."

> **Creo gives us speed, but also precision. That's what our customers expect from us. Solutions that are fast, reliable and built for the future.**
>
> **Daniele Luchena, CEO and Co-founder at ARCA Dynamics**

Looking Ahead: Orbiting Toward Opportunity

ARCA Dynamics is preparing for the full launch of its FALCO-X constellation by 2026, with plans to expand its capabilities and customer base. As LEO traffic intensifies and demand for space situational awareness grows, the company is well-positioned to lead the charge, offering scalable, reliable solutions that meet the needs of a dynamic global market.

The team is also exploring new business models and partnerships, leveraging its technical edge to unlock opportunities in adjacent sectors. From defense to commercial aerospace, ARCA's flexible approach and proven engineering pipeline make it a compelling collaborator for organizations seeking innovation at altitude.

With Creo as its digital backbone, ARCA Dynamics continues to push the frontier of space surveillance. The company's journey from student startup to global innovator demonstrates how the right tools, combined with vision and grit, can transform bold ideas into orbital reality.

"We're building more than satellites. We're building trust," added Argenteiro. "And that starts with engineering excellence."

Company Overview: ARCA Dynamics S.r.l.

Headquarters	Rome, Italy
Industry	Space Technology
PTC Products	Creo
Employees	22
Website	www.arcadynamics.space

Results

- **Accelerated Design-to-Orbit Timeline:** Rapid iteration and digital validation allow satellites to move from concept to launch faster than ever.
- **Precision Engineering for Harsh Space Environments:** Supports complex assemblies and tight tolerances across mechanical, electrical, and software domains.
- **Fast, Affordable Prototyping:** Enables low-cost 3D printing of plastic components for quick design validation, often for just a few euros.
- **Advanced Cabling Management:** Creo's cabling tools help visualize and route intricate wiring systems within compact satellite frames.
- **Reduced Material Waste:** Digital simulation and material optimization minimize rework and support more sustainable production practices.
- **Strategic Agility:** Allows ARCA to respond quickly to shifting market needs and client requirements.
- **Commercial Credibility:** Positions ARCA on par with larger aerospace firms - essential for winning institutional contracts.
- **Support for AI-Driven Autonomy:** Facilitates the mechanical design of systems that enable onboard AI processing and orbit determination.
- **Risk Mitigation:** Early digital validation reduces integration failures and protects timelines and budgets.
- **Client Trust and Consistency:** Reliable, high-quality outputs reinforce ARCA's reputation as a trusted partner in space surveillance.