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A QUICK-START GUIDE FOR INDIAN SATELLITE TEAMS

MISSION READY SOFTWARE



YOUR QUICK START GUIDE TO BUILDING AND OPERATING SPACECRAFT WITH CONFIDENCE — EVEN IF YOU'RE STARTING OUT.

India's space sector is expanding at an unprecedented pace. New entrants, start-ups and university spin-offs are moving from concept to launch faster than ever. But rapid growth also brings new challenges: lean engineering teams, limited budgets and tight schedules can turn spacecraft software into a critical bottleneck.

Your mission software underpins everything — from how you integrate your satellite on the ground to how you command it once it's in orbit. Yet many first-time teams underestimate how early they need to plan. This guide is designed to help you think ahead, avoid costly mistakes and lay a strong foundation for long-term success.

In this quick-start guide, we'll show you how to:

- Choose the right software foundations
- Build scalable, future-proof operations
- Avoid common pitfalls in flight and ground systems
- Navigate integration — even with limited in-house experience

Let's get your spacecraft mission-ready.

1. LAYING THE GROUNDWORK – WHAT YOU NEED BEFORE LAUNCH

Before you even select hardware, start thinking about how your satellite will be operated. Too many first-time teams leave software decisions until the last minute, which creates integration bottlenecks, rushed testing windows and, ultimately, risk in orbit. By treating software as a core part of mission design from day one, you give your team time to plan, test and build confidence.

Here's how to get it right:

DEFINE YOUR MISSION OPERATIONS EARLY

Your spacecraft isn't just a box in space — it's a live system that will need commanding, monitoring and updating for years. Decide now:

- Who needs access to mission data?
- How will your team handle day-to-day operations?
- What kind of user interface or automation tools will you need?

Don't wait for the hardware to be ready. Thinking about the ground segment now helps you avoid expensive rework later.

MAP SOFTWARE TO MISSION PHASES

Software is not a "launch-day" problem. It underpins pre-launch testing, commissioning, daily operations and eventual end-of-life.

- List the phases of your mission.
- Identify what data, commands and automation each phase will require.

Build your software requirements like a roadmap across the whole mission lifecycle.

IDENTIFY SKILL GAPS UP FRONT

Be honest about what your team can handle in-house. Do you have experience with:

- Spacecraft software integration?
- Mission control?
- Automation and testing?

If you don't, factor in engineering support or outsourced integration early. The right partner can save months of learning on the fly.

2. CHOOSING THE RIGHT SOFTWARE APPROACH

Once you know your operational needs and team capacity, the next step is selecting a software foundation you can trust. The wrong approach can lock you into inflexible systems or force expensive rewrites later. The right one lets you start small, scale up and stay in control.

USE MODULAR SOFTWARE FOR FLEXIBILITY

Think of your mission software as building blocks, not a monolithic slab.

- Can you plug-and-play between subsystems?
- Can you add new capabilities without rewriting everything?

Modular, pre-integrated components let lean teams develop faster and adapt as missions evolve.

PRIORITISE INTEROPERABILITY

Your spacecraft won't exist in a vacuum. It has to talk to test benches, ground stations and other systems.

- Choose software that supports standard interfaces (CCSDS, CAN, TCP/IP).
- Check compatibility with your ground infrastructure early.

Interoperability now prevents costly custom work later.

LOOK FOR PROVEN HERITAGE

A shiny new platform may look exciting, but without real-world flight heritage you're taking a gamble.

- Does your provider have experience in live missions?
- Can they show successful operations under similar constraints?

A proven track record = lower risk and faster onboarding.

MATCH SUPPORT TO YOUR TEAM'S EXPERIENCE

Some vendors just ship code. Others offer light-touch help or full integration support.

- What does your team really need?
- How fast do you need to be mission-ready?

The right support level can de-risk your timeline completely.

3. 5 COMMON PITFALLS FOR NEW TEAMS TO AVOID

Even the best-intentioned projects can stumble when software is treated as an afterthought. These are the traps we see most often with first-time mission teams — and how to avoid them.

DON'T TREAT SOFTWARE AS AN AFTERTHOUGHT

Hardware decisions often dominate early planning — but leaving software until late causes delays, cost overruns and painful workarounds.

Develop your flight and ground software in parallel with hardware to avoid duplication and integration headaches.

PLAN INTEGRATION TIME REALISTICALLY

Integration and testing almost always take longer than expected — especially if your team is new to space operations.

Block out a dedicated window for integration and validation, even for ground systems, so you're not caught out at launch.

DIY vs. SUPPORT

Doing everything in-house can seem cheaper, but hidden delays and skill gaps quickly eat up savings.

Consider where a "safe pair of hands" can accelerate your project — some vendors offer flexible engineering support or co-development services.

BEWARE OF OVER-CUSTOMISATION

It's tempting to build highly bespoke systems, but every custom line of code increases maintenance overhead.

Start with reusable, pre-tested components and add customisation only where it truly differentiates your mission.

THINK BEYOND LAUNCH DAY

Operations don't stop at orbit insertion. Without planning for commissioning, updates and anomaly handling, even good software can become a liability.

Choose solutions with integrated ops environments to smooth the transition from development to operations.

4.

WHY INDIAN TEAMS ARE PARTNERING WITH TRUSTED GLOBAL PROVIDERS

Building your first mission is challenging. Partnering with experienced global providers can de-risk the process, provide guidance, and accelerate your path to orbit.

HERE'S WHY TEAMS ARE CHOOSING TRUSTED PARTNERS

BENEFIT FROM PROVEN EUROPEAN HERITAGE

Learn from missions that have already flown successfully. Providers with live mission experience help you avoid common mistakes and streamline delivery.

Ask for case studies or references from similar missions to validate heritage and reliability.

TAP INTO SCOTLAND'S SPACE HUB

Scotland has a rich ecosystem for spacecraft development, combining innovation with proven operational know-how.

Collaborating with teams in established space hubs can give access to best practices, training, and support networks that reduce risk for new teams.

BUILD CONFIDENCE THROUGH COLLABORATION

A young or lean team benefits from mentoring and guidance — not just software. Partnering with experienced engineers means you can scale faster, avoid delays, and make informed decisions.

Look for vendors who offer flexible engagement — from light-touch advice to full mission integration — so you only pay for what you need.

SUPPORT FOR EVERY STAGE

Whether you're building a CubeSat or a national constellation, a trusted partner provides help from early planning to full operations.

Confirm what level of support is offered for integration, commissioning, and ongoing operations before committing.

READY TO MAKE YOUR MISSION A SUCCESS?

Choosing the right software and support early can save time, reduce risk, and help your team focus on what matters: building and operating your spacecraft with confidence. Whether you're planning your first CubeSat or scaling to a constellation, flexible, proven, and well-supported software foundations make the difference.

With Bright Ascension's HELIX® suite, you get:

- Modular, reusable software blocks
- Support from setup to mission operations
- In-built scalability for future growth
- Proven heritage from Scotland's space hub

Start small. Build smart. Scale seamlessly.

WHY HELIX ?

HERITAGE & TRUST

Backed by decades of experience from Scotland's space hub and European missions, HELIX® is trusted by organisations scaling from CubeSats to complex multi-satellite systems.

PROVEN, MODULAR & SCALABLE

HELIX® flight and ground software is built as flexible, reusable blocks that support anything from a single mission to a full constellation without the need for costly rewrites.



INTEGRATION & SUPPORT

Tailored onboarding, configuration and operational support help reduce risk and accelerate delivery, even for lean or less experienced teams.

COST-EFFECTIVE FLEXIBILITY

You can pick and choose the modules and support that match your current mission and budget, with the confidence it will scale seamlessly as your needs grow.



MAKE THE RIGHT CHOICE FOR YOUR MISSION

Building a spacecraft is hard — your software doesn't have to be. Flexible, reusable, well-supported software foundations help you launch faster, avoid delays and stay on budget.

READY TO TAKE THE NEXT STEP?

Request a free consultation to discuss your mission software needs.

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