DC

MULTI-PAGE APPLICATION PROPOSAL · v2.0

DoriCam Studio
Control Platform

Sidebar-driven desktop console for the spider-camera rig.

Branding · App architecture · Scope · Three commercial editions · 6-month delivery plan.

EDITIONS	PAGES	MODULES	MONTHS
3	10	9	6

RECOMMENDED · MID-ENTERPRISE · ■57.6L – ■67.2L

SECTION 01 · EXECUTIVE SUMMARY

From operator joystick to PLC tag.

This proposal covers the software application, GUI platform, safety layer, simulation platform, LiDAR integration support, Beckhoff/TwinCAT integration, testing and deployment for the **DoriCam Studio Control Platform**. The software scope focuses on the operating application and GUI layer. The application sends controller-ready commands, presets, paths, speed limits, no-fly zones and motion constraints to Beckhoff TwinCAT. TwinCAT and EtherCAT manage the real-time motor execution layer.

Three commercial models are offered: **Enterprise**, **Mid-Enterprise** (recommended), and **Essential**. All editions ship as a **multi-page desktop application** with a sidebar-driven workspace model.

SECTION 02 · PRODUCT BRANDING

Title bar, icon and theme direction.

Title-bar Name Option	Direction
DoriCam Studio Control	Production-floor authority. Direct broadcast-room language.
Qubox DoriCam Control Center	Parent-brand co-signed; foregrounds the Qubox umbrella.
DoriCam Motion Console	Engineering-first; resonates with PLC / integration teams.

Title-bar Icon Direction

- Minimal spider-camera cable icon
- Camera rig with 4-point anchor
- Hexagonal industrial motion icon
- AeroGlass translucent telemetry mark

Theme Support

- Dark theme · primary industrial operating mode
- AeroGlass translucent cards · soft shadows
- Light theme · optional engineering / admin mode
- 21st.dev inspired dashboard styling

SECTION 03 · APPLICATION ARCHITECTURE

Multi-page console. Sidebar-driven.

The application is **not** a single-page application. It uses a left sidebar navigation with separate modules and dedicated screens. Each screen has its own workflows, forms, charts, tables, status cards and action panels.

#	Page	Per-page widgets
01	**Dashboard**	Live XYZ Position card · Camera Speed card · EtherCAT Health card · Motor Health widget · Active Alarm widget · LiDAR Status widget
02	**Live Control**	Virtual Joystick widget · Camera Direction Controls · Manual Override Controls · Speed Control Slider · Emergency Slow Mode panel
03	**Presets**	Preset Table · Preset Save Form · Preset Recall widget · Favorite Presets panel · Preset Usage Analytics
04	**Path Programming**	Timeline Editor · Waypoint Table · Spline Path Visualization · Validation Panel · Simulation Preview
05	**No-Fly Zones**	3D Zone Editor · Zone List Table · Hard / Soft Zone Controls · Zone Color Legend · Zone Validation Alerts
06	**Venue Setup**	Venue Dimensions Form · Anchor Point Mapping · Zero Point Setup · Clearance Margins Form · Save Venue Profile
07	**LiDAR & Safety**	LiDAR Live Status · Alert / Warning / Danger indicators · Person Detection widget · Ball Detection widget · Safety Recommendations panel
08	**Simulation Mode**	Simulation Playback Screen · Collision Detection widget · Training Scenario Selector · Replay Timeline · Export to Live System
09	**Reports & Logs**	Alarm Logs · Audit Logs · Usage Reports · Operator Reports · Download Reports panel
10	**Admin & Settings**	User Roles · Password Settings · Motion Limits · Axis Enable / Disable · Diagnostics Panel

SECTION 04 · FUNCTIONAL SCOPE

Nine modules. One control room.

Module 1 · Live Operations Dashboard

- Real-time 2D venue visualization
- Real-time 3D camera visualization
- Live camera XYZ position
- Speed, acceleration, jerk, cable length
- Live motor status
- EtherCAT network health
- LiDAR health status
- Alarm and warning center
- Emergency mode visibility

Module 2 · Manual Controls

- Virtual joystick
- Manual directional controls
- Slow mode
- Emergency hold mode
- Gamepad / joystick integration
- Keyboard fallback control

Module 3 · Presets & Motion Automation

- Up to 100 presets
- Preset save / recall
- Timeline motion programming
- Waypoint editor
- Spline path editor
- Speed profile editor
- Acceleration and jerk profile editor
- Path validation
- Record and replay mode

Module 4 · No-Fly Zones & Safety

- 3D hard zones
- 3D soft zones
- Multiple simultaneous zones
- Live collision detection
- Predictive path validation
- Zone violation prevention
- Cable safety monitoring
- Descent blocking
- Safety alerts and warnings

Module 5 · Venue Setup & Calibration

- Venue dimensions
- Anchor point setup
- Zero point calibration
- Boundary marking
- Height limits
- Payload parameters
- Environmental compensation
- Venue profile save / load

Module 6 · Engineering & Admin

- Motion limits
- Axis enable / disable
- User roles and permissions
- Password-protected engineering access
- Audit logs
- Alarm history
- Diagnostics

Module 7 · Simulation & Offline Training

- Hardware-independent simulation
- Collision simulation
- Operator training mode
- Path replay mode
- Offline program validation
- Demo mode

Module 8 · LiDAR Integration

- Ground protection mode
- Ball detection mode
- Warning / danger zones
- Automatic emergency stop logic
- Person detection below camera
- LiDAR field switching
- Cable mute zone handling

Module 9 · Documentation & Deployment

- Operator manual
- Engineer manual
- PLC interface documentation
- Deployment guide
- Installation support
- UAT support
- Production deployment support

SECTION 05 · TECHNOLOGY STACK

Industrial · Real-time · TwinCAT-native.

Layer	Technology
Frontend / Desktop GUI	C# WPF + .NET 8
UI Architecture	MVVM Pattern
3D Engine	HelixToolkit.WPF
PLC Communication	TwinCAT ADS SDK
Database	SQLite / LiteDB
Reporting	PDF export engine
Logging	Serilog
Authentication	Role-based access control
CI/CD	Azure DevOps · GitHub Actions
Code Repository	GitHub Enterprise · GitLab

Optional AI/ML Enhancements

- LiDAR object classification
- Ball detection prediction
- Obstacle classification
- Predictive safety alerts
- Camera path optimization
- Operator recommendation engine

SECTION 06 · COMMERCIAL MODELS

Three editions. One platform.

Enterprise Edition — INR 96,00,000 – 1,05,60,000

Level: Full implementation · enterprise-grade · multi-venue
Team: 10 – 11 Resources · **Duration:** 6 Months
Suggested commercial range: INR 95,00,000 – 1,10,00,000
Best for: National broadcasters · premium sports infra · multi-venue

Includes

- Full software suite
- Full dashboard & visualization suite
- Full LiDAR integration
- AI/ML prediction layer
- Advanced logs and reporting
- DevSecOps · CI/CD pipeline
- Audit logs · advanced monitoring
- Multi-page application
- Full simulation platform
- Advanced analytics dashboard
- Advanced UI theming · dark + light
- SAST · DAST · Performance testing
- Infrastructure hardening · HA
- Role-based security

Mid-Enterprise Edition · ★ Recommended — INR 57,60,000 – 67,20,000

Level: Intermediate · balanced industrial deployment · single venue
Team: 6 – 7 Resources · **Duration:** 6 Months
Suggested commercial range: INR 58,00,000 – 75,00,000
Best for: Sports production · regional stadium operators · single venue

Includes

- Core GUI platform · multi-page app
- Presets and path editor
- LiDAR basic integration
- Basic dark + light themes
- Basic performance & security testing
- Logging and monitoring
- Dashboard
- No-fly zones
- Simulation mode
- Basic reporting and logs
- Basic CI/CD · deployment automation
- User roles and permissions

Essential Edition — INR 38,40,000 – 48,00,000

Level: Standard · basic production-ready · pilot deployment
Team: 4 – 5 Resources · **Duration:** 6 Months
Suggested commercial range: INR 40,00,000 – 55,00,000
Best for: Proof of concept · small-scale systems · pilot projects

Includes

- Dashboard
- Basic presets
- Basic no-fly zones
- Standard dark theme · basic light theme
- Basic deployment
- Limited documentation
- Manual controls
- Basic path programming
- Venue setup
- Basic title-bar branding
- Functional testing

Excludes

- AI/ML
- DevSecOps
- Advanced CI/CD
- Simulation engine
- Security hardening
- Advanced LiDAR analytics
- SAST / DAST
- Performance engineering
- Enterprise logging

Resource Cost Computation

Edition	Team	Monthly Rate	Duration	Total (INR)
Enterprise	10 – 11	■1,60,000	6 mo	**96,00,000 – 1,05,60,000**
Mid-Enterprise	6 – 7	■1,60,000	6 mo	**57,60,000 – 67,20,000**
Essential	4 – 5	■1,60,000	6 mo	**38,40,000 – 48,00,000**

SECTION 07 · TEAM STRUCTURE

Right hands on the right tags.

Role	Enterprise	Mid-Enterprise	Essential
Project Manager	1	1	1 (PM/BA)
Solution Architect	1 – 2	—	—
Frontend / Desktop Developers	2	2	2 (Full-Stack)
Backend / PLC Integration	2	2	1
QA Engineer	1	1	1
DevOps Engineer	1	1 (shared)	—
Security Engineer	1	—	—
AI/ML Engineer	1	1	—
TOTAL	**10 – 11**	**6 – 7**	**4 – 5**

SECTION 08 · SIX-MONTH DELIVERY PLAN

Six months · six checkpoints.

Month	Phase	Highlights
M1	**Discovery & Architecture**	Requirement workshops · TwinCAT comms planning · UX wireframes · PLC variable definitions · venue framework
M2	**Core Dashboard & Control Layer**	Dashboard screens · manual controls · 2D / 3D visualization · motor monitoring · alarm framework
M3	**Automation & Safety**	Presets · timeline editor · path engine · no-fly zone module · safety rules · calibration flows
M4	**Integration**	TwinCAT ADS integration · EtherCAT diagnostics · LiDAR integration · hardware comms testing · error handling
M5	**Simulation, Testing & Stabilization**	Simulation engine · offline training · functional / regression / performance testing · UAT
M6	**Deployment & Hypercare**	Production deployment · user training · documentation · bug fixing · final sign-off

SECTION 09 · OPTIONAL COST ITEMS

Add-ons and post go-live support.

Hardware & LiDAR Support

- LiDAR configuration & setup
- Mounting consultation
- IMU integration
- PLC safety relay integration
- EtherCAT troubleshooting

Post Go-Live Support

- 3 months support
- 6 months AMC
- 12 months AMC

Optional Enhancements

- Mobile monitoring app
- Cloud reporting dashboard
- Multi-venue support
- AI camera path prediction
- Video analytics integration
- Auto-focus via LiDAR
- Predictive maintenance dashboard

SECTION 10 · ASSUMPTIONS & OUT OF SCOPE

Assumptions

- TwinCAT kinematics already available
- Client provides all hardware
- Access to Beckhoff controller & PLC tags
- Hardware installation outside software scope
- EtherCAT commissioning handled separately
- UAT & production hardware access on time
- 1 production + 1 test environment

Out of Scope

- Hardware procurement
- Structural design
- Electrical wiring
- Motor commissioning
- Broadcast video switching
- Third-party safety certification
- Civil work
- Mechanical fabrication

SECTION 11 · FINAL RECOMMENDATION

Mid-Enterprise is the sweet spot.

The Mid-Enterprise Edition delivers the strongest balance between capability and commercial viability — strong GUI, safety logic, presets and automation, LiDAR integration, basic performance testing, moderate security and simulation support. A polished industrial-grade platform without the heavyweight cost of full enterprise.

Choose **Enterprise** only if multi-stadium deployment, broadcast-grade reliability, advanced security, AI-driven safety or full DevSecOps and compliance are required. Choose **Essential** only as a pilot or MVP.