Olzh Tech - High-Level System Architecture Overview

1. Operator Interface Layer (React + TypeScript)

- Modular, event-driven front-end interface for tactical mission planning and live fleet telemetry.

- Integrates control override mechanisms and command preauthorization protocols for restricted operations.

- Supports secure authentication and role-based access profiles.

2. Autonomous Control Layer (C++ with Python Bindings)

- Real-time, deterministic control loop executing mission logic and behavioral autonomy frameworks.

- Interfaced with custom reinforcement learning agents for adaptive threat response.

- Provides direct integration points for RTOS environments and embedded hardware abstraction layers.

3. Sensor Fusion & Perception Layer (OpenCV, ROS2)

- Synchronously aggregates and normalizes multi-modal sensor data (IMU, GPS, LIDAR, EO/IR video).

- Implements Bayesian update models and Kalman filters for dynamic situational reconstruction.

- Enables redundancy-aware perception pipelines for mission assurance in degraded signal environments.

4. Encrypted Communications Stack (QUIC + gRPC + AES-256)

- Custom encrypted communication stack leveraging stateless multiplexing with low overhead encoding.

- Integrates failover mesh topologies and edge-to-cloud handshake protocols.

- Supports forward secrecy and telemetry hashing with transport-layer encryption by default.

5. Mission Data & Logging Layer (Flat File Logs + SQLite + Optional Kafka Integration)

- Structured logging for full mission replay and auditability with time-synchronized checkpointing.

- Optional Kafka bus interface for stream processing in lab/sim environments.

- Supports both offline, air-gapped use cases and deferred sync modes.

This modular architecture enables scalability across unmanned aerial, terrestrial, and maritime platforms with minimal reconfiguration, while preserving operational security and national data sovereignty.