

Overview

What is the base station?

The Base Station is the ground control application used to monitor and control the rover during operation. It runs on an operator's laptop and provides a unified interface for live video feeds, navigation, task management, rover arm control, and sensor readouts.

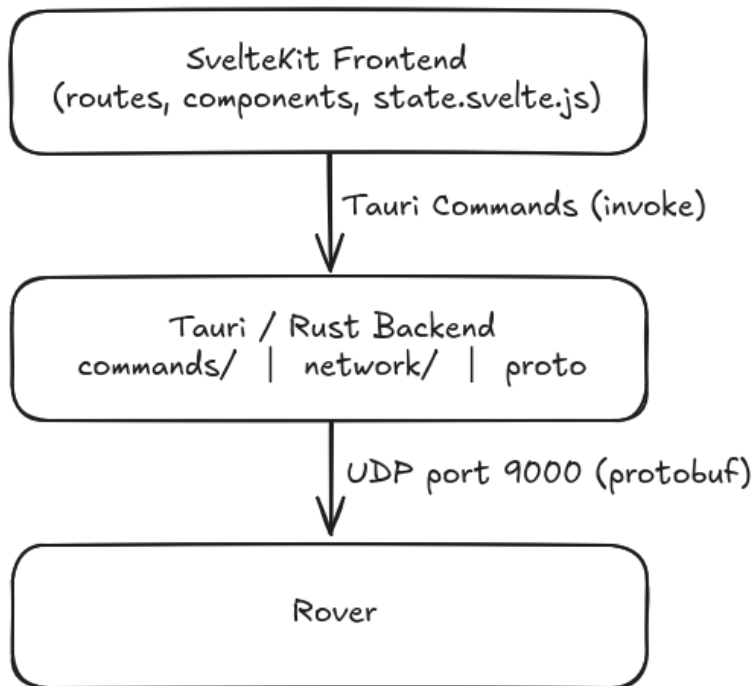
It is built with **Tauri v2** (Rust backend) and **SvelteKit** (TypeScript frontend), bundled into a native desktop application. Communication with the rover happens over **UDP** using **Protocol Buffers (protobuf)** for message serialisation.

Tech Stack

Layer	Technology
Desktop framework	Tauri v2
Frontend	SvelteKit + TypeScript
Backend	Rust
Build tool	Bun + Vite
Video streaming	GStreamer (MJPEG)
Rover communication	UDP on port 9000
Serialisation	Protocol Buffers
3D model rendering	(see Model Viewer)

System Architecture

At a high level, the app has three layers:



The frontend communicates with the Rust backend exclusively through **Tauri commands** (called via `invoke()`). The backend owns the UDP socket and all rover communication — the frontend never talks to the rover directly.

Project structure

```

ERC-SOFTWARE-BASESTATION/
├─ src/                                # SvelteKit frontend
│  └─ lib
│     └─ components/                  # Reusable UI components
│     └─ css/                          # css code
│     └─ proto/                       # Auto generated types from protobufs
│     └─ stores/                      # Svelte stores for reusable data across components
│  └─ routes/                          # Page routes
│  └─ state.svelte.js                 # Global reactive state
├─ src-tauri/                          # Tauri + Rust backend
│  └─ src/
│     └─ commands/                   # Tauri command handlers
│     └─ network/                    # UDP service + listener
│  └─ proto/                          # Protobuf definitions
│  └─ models/                         # Bundled 3D model files
│  └─ build.rs                        # Handling of protobufs during build
│  └─ Cargo.toml                      # Dependencies
│  └─ tauri.conf.json                 # Settings, configuration and permissions
  
```

```
|— fake_camera_gstreamer/ # GStreamer-based test video source
|— static/                 # Static frontend assets
```

Revision #8

Created 2026-04-14 14:42:48 UTC by Candela Cimadevilla Gonzalez

Updated 2026-05-05 09:42:19 UTC by Candela Cimadevilla Gonzalez