Summary of Phase 1

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| **Key Task** | **What to Document** | **Deliverables** |
| **Define System Architecture** | - System architecture diagram (backend, frontend, hardware interactions)  - API and framework decisions (Node.js, Angular, JSON, Chart.js)  - Justification for technology choices | - **System Architecture Diagram** - **Technical Design Document (TDD)** |
| **Define API & Backend Communication** | - RESTful API specifications  - Endpoints for controlling signal generator & retrieving oscilloscope data  - Potential WebSocket integration for real-time data | - API Specifications Document |
| **Define Hardware-Software Interaction** | - Hardware-software interaction plan  - USB-TMC setup process  - SCPI command list  - Expected oscilloscope responses | - Hardware-Software Interaction Diagram  - PyVISA Test Script  - SCPI Commands List |
| **Plan Authentication (OAuth-based Security)** | - OAuth provider decision (Google, GitHub, etc.)  - Authentication flow diagram  - User access levels (Roles & Permissions) | - Authentication Flow Diagram  - Technical Document on OAuth Implementation  - User Roles & Permissions Document |
| **Plan Kubernetes & CI/CD Integration** | - CI/CD pipeline design (Automated testing & deployment strategy)  - Kubernetes deployment architecture  - Hosting environment selection | - CI/CD Workflow Diagram  - Kubernetes Deployment Plan |
| **GitHub Version Control & Documentation** | - Repository structure  - Initial README.md  - Documentation for system architecture, API, and project overview | - GitHub Repository Setup  - Initial README.md |