# ANDERSON INNOVATIONS

# AEG GRID

Modular Smart-Power & Energy Monitoring System

**Project concept:** Build a low-voltage prototype that measures electrical and environmental data, sends it to a dashboard, and turns raw measurements into clear information about how a system is operating.

## 1. Project Vision

AEG GRID is intended to become Anderson Innovations' first major hardware-and-software engineering project. The long-term idea is a modular platform for monitoring energy use and system conditions in labs, workspaces, buildings, and other environments.

**Core philosophy:** measure → transmit → visualize → understand → improve.

## 2. What the Prototype Should Monitor

| Category | Example measurements |
|---|---|
| Electrical | Voltage/current on a safe low-voltage test system; power and energy estimates |
| Environmental | Temperature; optional humidity |
| System | Device status, uptime, connection status, battery level |
| Events | Threshold alerts and unusual changes in measured values |

## 3. Version 0.1 — The First Build

• **Controller:** a suitable low-voltage microcontroller development board.

• **Sensors:** safe, isolated sensors appropriate for the chosen low-voltage test setup.

• **Connectivity:** Wi-Fi or another suitable local connection.

• **Backend:** a small service that receives and stores measurements.

• **Dashboard:** a web interface showing live readings, history, and device status.

• **Enclosure:** a simple prototype enclosure, followed later by a CAD-designed enclosure.

## 4. System Architecture

**Sensors → Microcontroller → Network → Backend / Database → AEG GRID Dashboard**

The first version should favor simplicity and reliability. Every measurement should have a timestamp and a clear unit so that later versions can support historical analysis.

# 5. Dashboard Concept

| AEG GRID | SYSTEM STATUS: ONLINE |
|---|---|
| **Current load** | 82% of configured test threshold |
| **Energy today** | 12.4 kWh (example value) |
| **Temperature** | 31 °C (example value) |
| **Connected devices** | 3 |
| **Alerts** | 0 active |

The values above are only interface examples, not target specifications.

# 6. Development Roadmap

| Phase | Goal | Deliverable |
|---|---|---|
| 0 | Research & safety | Define low-voltage test setup, sensors, data model, and requirements |
| 1 | Proof of concept | Read one or more sensors and display live values locally |
| 2 | Connected prototype | Transmit measurements to a backend |
| 3 | Dashboard | Live charts, device status, historical data |
| 4 | Prototype enclosure | CAD model + physical enclosure |
| 5 | Validation | Repeatable tests, error tracking, documentation |
| 6 | Pilot | Small controlled deployment with permission |

# 7. Future Versions

• **GRID 2:** multiple monitored devices and improved analytics.

• **GRID 3:** larger-scale monitoring with modular sensor nodes.

• **GRID Pro:** commercial features such as team accounts, reporting, alerts, and integrations.

• **Long-term:** professionally designed electronics, custom PCB, refined enclosure, and documented validation.

# 8. What Makes It an Anderson Innovations Project

GRID combines embedded programming, electronics, networking, software engineering, data visualization, CAD, prototyping, testing, and product design. It therefore demonstrates that Anderson Innovations can build a complete system rather than only a software demo.

# 9. Documentation for the Anderson Innovations Website

• Project overview and the problem being addressed

• Original concept sketches and architecture diagrams

• CAD and enclosure development

• Prototype photographs

• Circuit and sensor diagrams

• Dashboard screenshots

• Build logs and engineering journal entries

• Testing methodology and measured results

• Known limitations and next steps

• Short demonstration video

## 10. Safety Boundary

**Start with low-voltage, battery-powered, or properly isolated test electronics.** Do not experiment with household mains wiring or expose yourself to hazardous electrical systems. Any higher-voltage work should only be designed, supervised, and performed by appropriately qualified adults/professionals using proper equipment and procedures.

## 11. Definition of Success for V0.1

A successful first prototype should reliably collect measurements, timestamp them, transmit them, display them in a clean dashboard, and produce repeatable results in a controlled low-voltage test environment. The goal is not maximum complexity; it is a working, well-documented system.