

Advanced Water Management (AWM)

Autonomous water level monitoring & pump control



Overview

An autonomous, low-power system designed to monitor water tank levels and automatically control a pump for a 7-houses community in northern Romania (where my parents live).

The system replaces manual checks with a self-sustaining electronic solution, suitable for remote or unattended installations.

System Architecture

- **Slave unit:** Solar-powered tank module with waterproof ultrasonic level sensing
- **Master unit:** Receives wireless data, displays system status, and controls the pump
- **Communication:** 2.4 GHz RF
- **Pump operation:** Automatic and manual modes

Technical Stack

- **MCUs:** Arduino Nano (Master & Slave)
- **Sensor:** Waterproof ultrasonic distance sensor
- **Wireless:** NRF24L01 radio modules
- **Power:** Solar panel, Li-ion battery, charging & boost circuitry
- **Interface:** 20x4 LCD
- **Control:** Relay-driven pump control

Software & Power

- Modular embedded firmware (C)
- Configurable tank parameters and thresholds
- Low-power sleep modes for autonomous operation

Outcome

- Continuous autonomous monitoring
- Reduced manual intervention
- Reliable and scalable water management solution

Skills: Embedded systems • Low-power design • Wireless communication • Control logic • System integration

Awards: 2nd Place at the international Electronics Contest on instructables.com

More details: <https://www.instructables.com/Advanced-Water-Management-AWM-in-10-Steps/>

Classics

Mechanical & electrical vehicle restorations



Dacia 1300, 1978



Aro 10.4, 1986



Aro 10.4, 1991

Overview

Restored multiple vehicles, combining mechanical repairs, electrical troubleshooting, and component upgrades.

Projects demonstrate hands-on engineering, problem-solving, and attention to detail across complex systems.

Technical Highlights

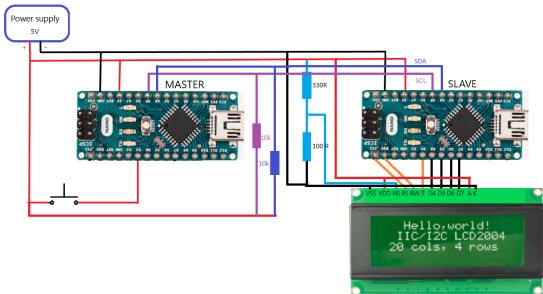
- **Mechanical systems:** engine rebuilds, suspension repair, brake servicing
- **Electrical systems:** wiring, sensors, lighting
- **Fabrication & customization:** custom parts, bodywork
- **Project planning:** diagnosing issues, sourcing parts, scheduling work

Skills Demonstrated

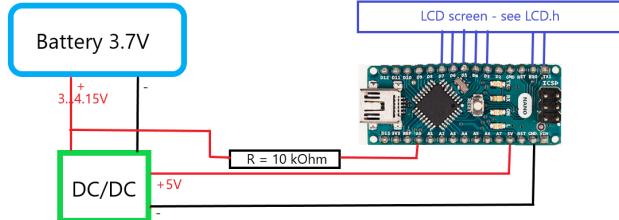
Mechanical diagnostics • Electrical troubleshooting • Component integration • Fabrication • Project management • Problem-solving

My Libraries – GitHub

Code, libraries & embedded systems



I2C-communication



ADC-battery-SOC

Overview

My GitHub hosts a selection of **embedded systems, electronics, and firmware projects** demonstrating:

- End-to-end system design
- Embedded programming (C/C++)
- Wireless and wired communication protocols
- Low-power and battery management solutions

Key Highlights

- Firmware for autonomous water management systems
- Custom libraries for LCD displays and sensor interfaces
- Battery monitoring and low-power optimization
- Modular, well-documented embedded code

Skills Demonstrated

Embedded C/C++ • Communication protocols (I2C, USART, RF) • Library development • Low-power electronics • Firmware testing & deployment

Portfolio & Source Code

Full repositories: github.com/Ovidiu22