

ElectroCap Project Proposal

Digital Wine Temperature Controlling

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TÉCNICO LISBOA

1. Advisors and Mentor

- Scientific Advisor: To be defined
- Scientific Co-advisor: To be defined
- Coordinator: Professor Marcelino Santos
- Mentor: Joaquim Antunes

2. Problem definition

- Temperatures are an essential variable on wine production and currently, in most of the winery, the temperature measurements and controls are made locally on the winery.
- There are a few winery that have this type of control, but it is designed especially for them when the infrastructure is being built.
- When the winery needs to expand their number of wine vats they need to do a new electrical installation.
- With this being such an important role, we believe that there needs to be a way of monitoring the temperature anywhere, with an easy implementation so that every wine house can have this type of system without having to do very big investments.

3. Solution beneficiaries

- Enologists who require the ability to monitor temperatures at any time and from any location.

- CEOs with a more controlled product with fewer risks.

4. Technological solution

We have two possible solutions for the problem:

- **Monitoring System:** using the installation already implemented in the winery and send the data to the website.
- **Monitoring and Controlling System:** a modular solution that does both the temperature controlling and sends the data to the website.

5. Solution requirements

- Our proposed solution must emphasize on scalability by integrating multiple submodules that proficiently read sensor information and engage in two-way communication with the main module.
- Functionality and reliability are pivotal in our solution, ensuring the system's capacity to read, communicate and analyze sensor information for an easy monitoring and temperature control.
- Compatibility with older winery systems is an essential aspect, ensuring a smooth and cost-effective implementation.
- Security should also be included on our project, guaranteeing that all information sent to the website remains anonymous and is accessible only to authorized winery owners or employees.

6. Technical challenges

- Reliable measurements
- Correct data transmission
- Time constraints
- Easy installation
- Reliability
- Safe actuation

7. Competitors and previous work

- Competitors: Many of our competitors are large corporations such as Omron and Siemens, offering generic solutions that aren't specifically tailored to the needs in the winemaking industry.
- Previous work: In our team we have students with a lot of experience in wine production and electrical modulacion.

8. Partners

To help us with our project we have the help of the winery Adega da Morgada. They will give us indications on how a monitor system would be the most effective and what type of requirements we need to have into consideration.



ADEGA DA
MORGADA

9. Testing and validation metrics

In this project, we need to measure the temperature precision and range as well as the PH levels in the several wine making processes, in order to get the best product possible.

- Temperature precision
- Temperature range
- PH precision

Through these measures, we can secure that our product assure the quality standards and satisfies the user experience and expectations.

10. Division of labor (I)

Henrique Póvoa	David Antunes	Henrique Simões
Telecommunication	Software	Software
Protocol Research	Raspberry Programming	Raspberry Programming
Protocol Selection	Submodule Programming	Submodule Programming
Hardware Integration	Testing	Testing
Finances	Documentation	Web Development

11. Division of labor (II)

Miguel Lopes	Gonçalo Almeida	Miguel Velo
Hardware	Hardware/PR	Telecommunication
Board Research/Implementation	Sensors Research	Protocol Research
Sensors Research	Board Research	Protocol Selection
Sensors Interfacing	3D printing case	Software Integration
Documentation	Communication	Documentation

12. Schedule

Research:

- Start - December (1)
- End - February (23)

Implementation:

- Start - February (23)
- End - April (30)

Testing and Validation:

- Start - May (1)
- End - June (Presentation day)