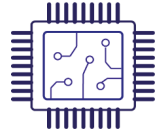


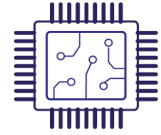
# MATRONIX PROJECT PLAN

**PROJECT: MODULAR LED MATRIX  
SCROLLING DISPLAY**

**COMPANY: MATRONIX**

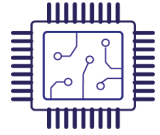


Date:			
Participants:	Project group LED matrix superstar McAwesomeville		
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Version	[1.1]		
Clients	Saxion University of Applied Sciences		
Tutor	Ali Yuksel		



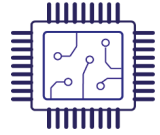
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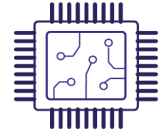
## LIST OF FIGURES

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## ABBREVIATIONS

DSP	Digital Signal Processing
FFT	Fast Fourier Transform
TL;DR	Too Long; Didn't Read
LED	Light Emitting Diode



## BACKGROUND

### INTRODUCTION

Team Matronix is a company founded in 2022 as a part of a university project for the class Project Simulation & Realization. It consists of a group of five students from Saxion University of Applied Sciences majoring in Electrical Engineering.

This company has as a main goal to design a fully functional RGB LED sign and document every step of the development of the project.

The team is ready and confident to offer the best quality possible in their products and to comply to their clients' demands.

### DESCRIPTION

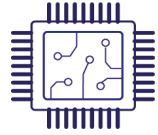
Our team was tasked with creating a wireless programmable LED message sign board for users to display a message they wish. The team came up with a simple solution to the client's needs, a sign with multiple modular displays that can be configured based on the user's needs to create a better viewing experience for viewers.

### MOSCOW METHOD

The MoSCoW method operates by splitting the clients' requirements into the most important ("Must"), all the way down to additions which would be nice to have, but are not necessary ("Could"), while also agreeing on things which are not feasible due to either timing issues or just not enough manpower ("Won't have").

Must:

- Clearly visible from 10m
- Mobile
- Cordless
- Energy via battery
- Wireless data transmission
- Battery life for at least 1 hour
- Display must scroll the text.



Should:

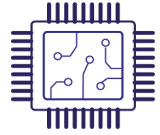
- Battery life of 3 hours
- Wide enough for clear messages

Could:

- Display weather information when not used
- Speaker to read messages that are displayed
- Magnet connection
- Scalable and modular design
- Modular batteries
- Hot swappable batteries
- Display GIFs and videos
- Display images or videos
- Modules for additional features (temperature, humidity, and so on).

Won't have:

- Infinitely scalable display
- Power from solar panels
- Replaceable LEDs (in case one breaks)
- Connect external Display (LCD, OLED, ...) for extension
- Use device as monitor with display input (HDMI, VGA, Composite)



## PROJECT OBJECTIVES

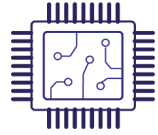
The project objectives include:

- The project is designed for maximum energy efficiency
- The text must be readable from a 10 meters distance.
- The text display should be multi color (RGB).
- The power supply via a battery.
- The communication to the system must be wireless
- The project group has regular updates with the client.

Aside from these strict requirements, we also implemented some secondary objectives we mean to implement in our project.

- The project will use multiple display modules side to side/stacked up.
- Make displays modular/work independently by disconnecting and reconnecting them
- Use high-current batteries to provide enough current
- Implement hot-swappable batteries
- 3D-printed and/or laser cut casing
- Use magnets and pogo-connectors to connect and disconnect the displays.
- If displays are disconnected, display different messages.





## PROJECT ACTIVITIES

The project activities are divided into three stages

Preparatory stage:

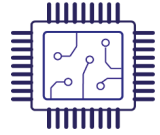
- creation of a final concept
- Assigning organizational roles
- Making a project plan (also, in documentation)
- Cost estimation and budgeting
- Assigning deliverables

Design and implementation stage

- Making a functional and technical design (also, in documentation)
- Creating the product (hardware and software implementation)
- Testing the product
- Product assembly
- Progress report presentation (weekly)

Final stage

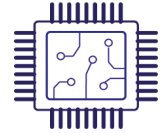
- Final Product delivery
- Documentation of the process in the form of a final report and presentation.



## PROJECT BOUNDARIES (SCOPE AND PRE-CONDITIONS)

The project has a duration of two quarters, which is about 4 months estimated. In terms of project width, there was no clear instruction on what is outside the scope of the project, only basic conditions. Based on the client's requirements, the product should be mobile, cordless, powered by a battery, show a text in multicolor and readable from ten meters away. To make the project a success, those conditions must be fulfilled.

A budget of 75Euros has been given to acquire materials needed for this project, the final product is to be delivered by the sixth week of the second quarter



## QUALITY ASSURANCE

Matronix is committed to delivering a product of immense quality for our clients. Each employee has been involved in a prior project of some sort that requires them to apply their Electrical and Electronic skills and knowledge, in addition, the company has weekly meetings with the sponsor to ensure the product is developing in accordance with the requirements, moreover, the sponsor has access to various intermediate results (Project Plan, Functional Design, Technical Design & Final Report) and can, in turn, provide feedback when needed, thus validating the company's claims of providing a high-end product at the end of this project.

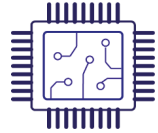
Delivering a high-quality product crucial to a product's success. Therefore, the sponsor participates in the assessment of the project by testing the final product, they will thoroughly assess the product and decide whether it satisfies all the previously stated requirements or not

The sponsor will verify the following specifications to ensure that Matronix has in fact implemented these specifications in the product.

### **System specs**

1. Designed for maximum energy efficiency ideally last for 30min on one charge
2. Text must be readable from a 10-meter distance and must be mobile
3. The text display should be multi-colour.
4. The power supply via a battery.
5. The communication to the system must be wirelessly.

Matronix will ensure this project is conducted with the utmost regard for the safety of each participant during the project, as well as creating a safe product for the client. There are no major safety threats involved with this project therefore, adhering to standard laboratory safety rules will be sufficient.



## PROJECT ORGANIZATION

See *Project Management* from Roel Grit.

## ORGANISATION

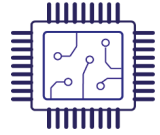
The Project organization is as follows:

• Joshua	Electronics/Programming	Group lead	511266@student.saxion.nl
• Karolis	Electronics/Programming		517546@student.saxion.nl
• Borna	Power delivery		481209@student.saxion.nl
• Esther	Power delivery	Minute taker	510127@student.saxion.nl
• Luuk	Power/2D -3D modelling		523822@student.saxion.nl

## INFORMATION

### Stakeholders

- The project group members
  - Borna Modric
  - Joshua Phiri
  - Luuk Vulkers
  - Karolis Juozapaitis
  - Esther Ajumo
- Tutor
  - Ali Yuksel
- The client
  - Saxion University of Applied Sciences

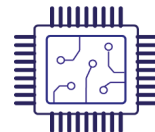


## Communication

Within the project group we will weekly have two meetings. Aside from these, there is a Discord server for online communication and group calls. Minutes are updated weekly to check back on what has been happening, and it can be found on Blackboard.

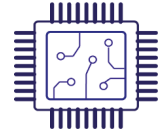
Communication with the client will be had with regular client meetings. These will occur in the following weeks:

- Week 1.3
  - Project Plan presentation
- Week 1.6
  - Final Technical Design
- Week 1.8
  - Midterm Presentation
- Week 2.1
- Week 2.4
- Week 2.6
  - Demonstration final product



## PLANNING

- *See GAANT Chart*

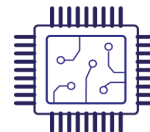


## COSTS AND BENEFITS

- As the project will be done using MOSCOW the final costs of the projects can only be predicted and are likely subject to change during the development process due to design changes and/or fixes. Simply speaking more features will likely include a higher cost. (Time and money)

Part & Link (Preliminary)	Quantity (Preliminary)	Price/pcs. (excl. VAT) (Preliminary)
<a href="#">64x32 RGB LED Matrix - 320x160mm</a>	2 Pcs.	€ 21.07
1. <a href="#">ESP32-WROVER WiFi Module - PCB Antenna</a>	1 pcs.	€ 4.55
Battery		
Misc.		
DC/DC Converter		
Logic Level Shifter		

- While monetary costs are important to figure out if the project is in scope of the given budget. Time is a constraint that should also be taken into account. Even when everything is in order what could result in a failed project is incorrectly set deadlines for each part of the project. This should be taken into account in the GAANT chart.
- The end result will be a fully functional, battery powered and wirelessly controlled scrolling display board that would allow to quickly and easily communicate any important notices, information or updates without physically interacting with the device itself. Assuming enough time is present additional features will be added the features mentioned are included in the MOSCOW section
- As for the compensation of the team members. A sufficient grade is the bare minimum that is agreed upon. Fulfilling all the stated requirements should result in a perfect grade.

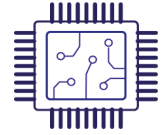


## BIBLIOGRAPHY

Grit, R. (2010). *Project managment*. Noordhoff Uitgevers.

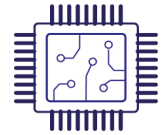






## GANTT CHART

Project Name	Project Start	Project End									
Simulation & Realisation	05/09/2022	16/01/2023									
Key											
Split by sub topic To be decided	SBST										
	TBD										
Deliverables & V-Model	Tasks	Due	Done by:	W1.1	W1.2	W1.3	W1.4	W1.5	W1.6	W1.7	W1.8
Project Plan	Introduction		Borna								
	Project Objectives		Luuk								
	Project Activities		Esther								
	Project Boundries (scope and pre-conditions)		Esther								
	Results	19/09/2022	Karolis								
	Quality Assurance		Joshua								
	Project Organisation		Luuk								
	Planning (Gant Chart)		Joshua								
Costs and Benefits		Karolis									
Risk Analysis		Borna									
Functional Design	Introduction		TBD								
	Analysis of Requirements		SBST								
	Final Concept	03/10/2022	SBST								
	Elaboration of Functional Design		SBST								
Technical Design	Introduction		TBD								
	Elaboration of Technical Design	24/10/2022	SBST								
	Technical Design Intergration		SBST								
Mid Term Presentation	Slides		ALL								
	Presentation	31/10/2022	ALL								
H o l i d a y											



## RISK ANALYSIS

#	Risk	Probability	Severity	Actions to Minimise Risk
	Are project members sufficiently aware of problems and objectives?	Remote	Moderate	Look into the MoSCoW method
	Is the field of result (scope) sufficiently defined?	Unlikely	Major	Good discussion on chosen concept
	Is there enough distinction between this project and other projects?	Remote	Minor	
	Has enough time been reserved for coordination and decision-making?	Unlikely	Major	Meeting deadlines, good time management
	Are the boundaries and preconditions clear?	Remote	Moderate	Looking into the clients demands
	Are the boundaries limiting enough?	Unlikely	Moderate	