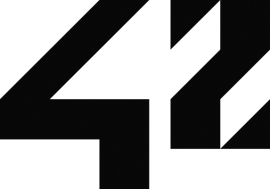
Rainbow Clock

Electronics

User’s manual

*Document Revision. A*

# Table of contents

[Table of contents 1](#_Toc443564049)

[Glossary 2](#_Toc443564050)

[Product overview 3](#_Toc443564051)

[1. Description 3](#_Toc443564052)

[2. Capabilities 3](#_Toc443564053)

[3. Quick specs 3](#_Toc443564054)

[Basic operation 4](#_Toc443564055)

[1. Reading the time of day 4](#_Toc443564056)

[2. Changing the color scheme 4](#_Toc443564057)

[3. Updating the time on the clock 4](#_Toc443564058)

[Advanced operation 5](#_Toc443564059)

[1. Synchronizing the clock using Bluetooth 5](#_Toc443564060)

[Technical details 6](#_Toc443564061)

[Planned features 8](#_Toc443564062)

[Contributions 9](#_Toc443564063)

[Endnotes 10](#_Toc443564064)

# Glossary

1. Microcontroller

An embedded computer integrating a whole range of peripherals in a small package for convenience.

1. Bluetooth

A wireless communication standard permitting short-range exchange of data between electronic devices.

1. Refresh rate

A measure of the number of times an image can be drawn completely over the period of a second; this value is expressed in Hertz. Synonymous to *“FPS”*.

# Product overview

## Description

Rainbow Clock is an unusual timekeeping device characterized by an exotic look and designed with electronics in mind.

## Capabilities

* Display the current time of the day
* Synchronize itself via a Bluetooth connection
* Alter its color scheme depending on events

## Quick specs

* Microcontroller: PIC32MZ series
* LEDs: 60, RGB type
* Refresh rate: ~10Hz
* Power: 20Watt max

# Basic operation

## Reading the time of day

In general we have the hour indicator represented with 3 leds in same color, minutes are represented by 2 leds, and seconds are represented with a single led. By default color for hours is red, for minutes are green, and seconds by blue color.

## Changing the color scheme

Using the central dial, navigate the menu looking for “Color Config.”

Validate your choice. You will be presented with a choice of colors on the screen. Use the dial again, select a color and validate your choice.

## Updating the time on the clock

Using the central dial, navigate the menu looking for “Time Config.”

Validate your choice.

# Advanced operation

## Synchronizing the clock using Bluetooth

*to-do ...*

# Technical details

1. Block diagram

Buzzer

PIC 32

IR/Light sensor

Raspberry Pi

Pressure sensor

Bluetooth

Temperature sensor

AC to DC Power supply

1. Components required for the project

* 1 *(one)* PIC32xxxxxx microcontroller. Ref: xxxxxxx
* 1 *(one)* strip of 60 RGB LEDs. Ref: xxxxxxx
* 1 *(one)* incremental rotary encoder Ref: 1191733
* 1 *(one)* 20x4 alphanumeric LCD screen Ref: 2063162
* x *(xxx)* resistors xΩ Ref: xxxxxxx
* x *(xxx)* capa xF Ref: xxxxxxx

…

# Planned features

* ***Display basic weather data and forecast using built-in sensors***

Data gathering could reveal itself being a nice addition to the project.

# Contributions

In alphabetical order:

* **ltesson** ltesson@student.42.fr
* **nahmed-h** nahmed-h@student.42.fr
* **schiad** schiad@student.42.fr
* **vchesnea** vchesnea@student.42.fr

*Page layout by:* vchesnea

# Endnotes