Electronics

Rainbow Clock

User’s manual

Document Revision. A

Table of contents

Table of contents **1**

Glossary **2**

Product overview **3**

1. Description 3
2. Capabilities 3
3. Quick specs 3

Basic operation **4**

1. Reading the time of day 4
2. Changing the color scheme 4
3. Updating the time on the clock 4

Advanced operation **5**

1. Synchronizing the clock using Bluetooth 5

Technical details **6**

Planned features **8**

Contributions **9**

Endnotes **10**

Glossary

1. Microcontroller

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

2. Bluetooth

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

3. 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

1. Description

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

2. Capabilities

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

3. Quick specs

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

Basic operation

1. 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.

2. 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.

3. Updating the time on the clock

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

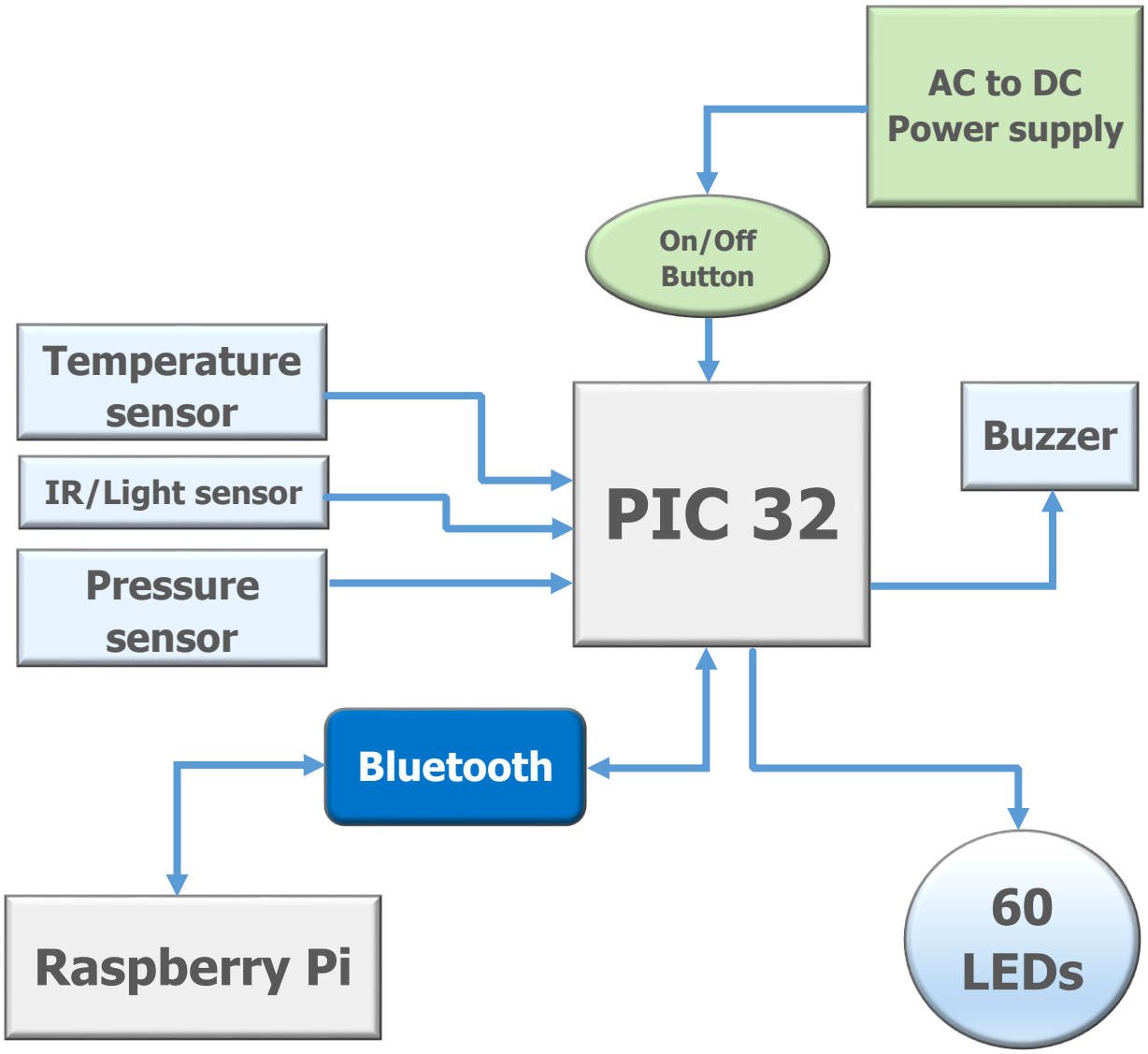
Advanced operation

1. Synchronizing the clock using Bluetooth

to-do ...

Technical details

1. Block diagram



2. 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