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**PO3\_DGW\_Digital watch**

**(HSI)**

**DOCUMENT HISTORY**

Table Document History including Version, Description, Author, Date and Status

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| --- | --- | --- | --- | --- | --- |
| **Document name** | **Version** | **Description of Change** | **Author** | **Date of last update** | **Status** |
| HSI  Document | 1.0 | - Initial creation of the document. | Basma Abdelhakim | 22/1/2020 | Draft |
| 1.1 | - Adding document status table.  - Listing all the needed hardware.  - Adding reference table. | Basma Abdelhakim | 31/1/2020 | Draft |
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# 1.Introduction

## 1.1 Purpose

This document identifies all the Hardware Software Interface (HSI) data that reference

a digital watch described in PO3\_DGW\_Digital watch(CYRS) document.

## 1.2 Hardware requirements

1. ATmega32 microcontroller on Arduino pro mini kit.

2. 0.96 OLED LCD.

3. Tactical buttons.

4. Buzzer

## 1.3 System block diagram

liquid crystal display

Microcontroller

Button.1

# 

Buzzer

Button.2

Button.3

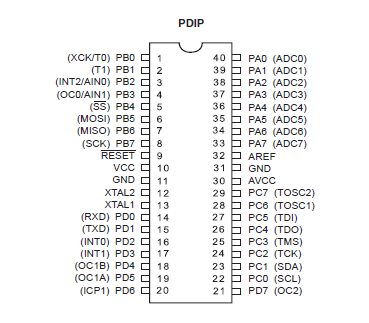
**Figure 1** System block diagram.

# 2. Microcontroller specification

The microcontroller used shall be 8-bit AVR microcontroller with 32Kbytes In-System

Programmable Flash.

## 2.1 Pin Configuration Layout



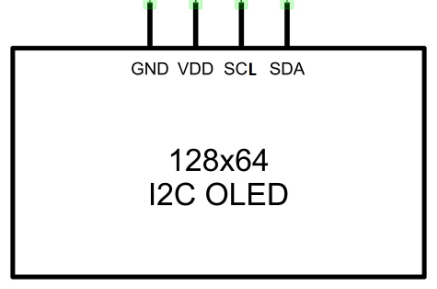
**Figure 2** Microcontroller Pins configuration.

## 2.2 Pins description

* **VCC**: Digital supply voltage.
* **GND:** Ground.
* **Port A (PA2...PA0):**
* Port A (PA2…PA0) shall serve as output pins.
* Port A (PA2…PA1) shall be used for interfacing data pins of Liquid Crystal display from (D0…D1).
* Port A (PA0) shall be used to interface buzzer.
* **Port D (PD2...PD0):**
  + Port D (PD2...PD0) shall serve as input pins.
  + Port D (PD2...PD0) shall be used to interface button.1, button.2 and button.3 relatively.

# 3. Liquid Crystal display specifications

The display used shall be OLED LCD.

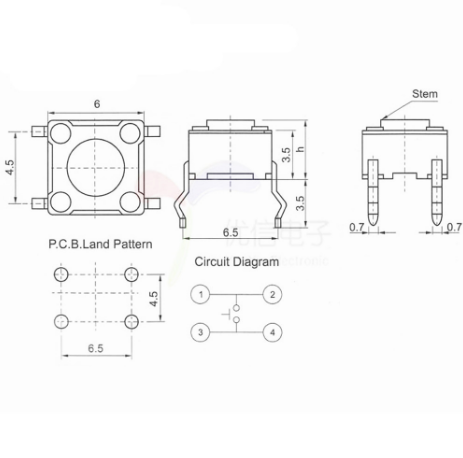


**Figure 3.**OLED LCD schematic.

# 

# 4. Buttons specifications

The buttons used shall be tactical buttons.



**Figure 4.** Tactical switch schematic.

# 5. Buzzer specifications

The buzzer used shall be an active buzzer.

# 6. Reference table

**Table 2** HSI requirements referring to CYRS requirements

|  |  |  |
| --- | --- | --- |
| **CYRS requirement** | **HSI requirement** | **Requirement description** |
| Req\_ PO3\_DGW\_CYRS\_02\_V01 | Req\_ PO3\_DGW\_HSI\_01\_V01 | The OLED LCD displayer shall be used to display the chosen mode interface according to the user’s choice. |
| Req\_ PO3\_DGW\_CYRS\_03\_V01 | Req\_  PO3\_DGW\_ HSI\_02\_V01 | The active buzzer shall be used to notify the user when the alarm’s time hit. |
| Req\_ PO3\_DGW\_CYRS\_08\_V01.1 | Req\_  PO3\_DGW\_ HSI\_03\_V01.1 | The tactical switches shall be used to switch between the three modes of the digital watch. |