**Requirements Document**

1. Customer / Market:

This product is intended to be used as intelligent device for home or office automation. The target market is domestic as well as industrial.

1. Time Frame  
   Start of project: 28th May 2014  
   End of project: 25th June 2014
2. Goals

3.1 Purpose

This product is designed to control the ON or OFF timing of up to two electrical appliances independently in synchronization with a real time clock or using a countdown timer.

3.2 Benefit

* Allows user to automatically switch an electrical device on or off
* Provides flexibility to user to control two different devices
* Provides flexibility by giving different modes (countdown or real time)
* Can be used to save energy

4. Application of product

4.1 Area(s) of application:

Can be used anywhere where electrical appliances running on 230V AC supply need to be controlled using real time clock or countdown timer  
Eg: Switching OFF light and printer in office after 7 pm everyday

4.2 Users, stakeholders:  
This device can be used by common people in day-to-day life as well as by industries for commercial premises.

4.3 As – is processes  
Presently, the process is manual. The user has to be physically present and needs to manually switch off the electrical appliance. Failure to perform this action leads to wastage of energy.

4.4 Supported to-be processes:  
 Automated systems which will switch the appliances on or off at user specified time.

5. Product functionality

* 1. All functions
* Reset the system.
* Set real time on the system.
* Select device to be controlled. (First or Second)
* Select operation – (It allows the user to select the device to be switched on or off.)
* Select mode and set time – (It allows the user to set real time at which or countdown time after which the device is to be switched on or off.)
  1. Detailed IO, user interface

Inputs –

1. Reset input
2. Keypad input for time setting
3. Joystick for device selection.

Outputs –

1. Relay to control external electrical appliances
2. LEDs as indicators.
3. LCD for user interface.

6. Product data

6.1 Quantity structure

|  |  |  |
| --- | --- | --- |
| Hardware | Pieces | Cost ( in euros) |
| AVR Butterfly board | 1 | 30,00 |
| External Keypad | 1 | 1,00 |
| Contact Relays (2 channel) | 1 | 5,00 |

6.2 Demands on hardware, software, interface

Following Hardware will be used:

1. AVR Butterfly board.
2. 2 channel relay supporting 230V 6 Amps electrical devices.
3. 4 X 4 keypad as a user interface.
4. No external software required.

7. Product performance

7.1 Response times, battery life time  
Moderate response time and battery life time of 100 working hours.

8. Quality specifications

* Usability – Keypad, joystick and LCD available for user interface.   
   Easy to use because of integration of keypad.
* Reliability- Depends on battery life and functioning of relays
* Efficiency – highly efficient.