

Internet of things Project

Danske Kroner Money Converter

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Project Participant:

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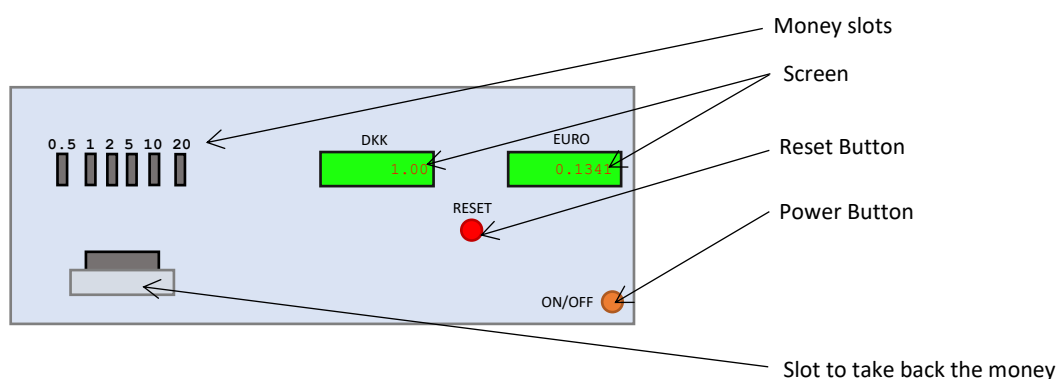
Project Description:

The Danske Kroner Money Converter (DKMC) is an IoT machine capable of convert your amount of coin money into euros instantly. The DKMC will be connected to internet and will verify the exchange rate of Euro to DKK and show exactly the number of euros you have.

The machine will have six slots where you can insert your kroner coins by value. Every slot will contain a motion sensor, if a coin is insert in one of the slots, the sensor will send this information to the IoT module. The module will increment the money value of DKK which will be display in a small screen. Then It will convert it by using the exchange rage available on the internet and will display the euro value to another screen.

Also, an actuator will be necessary to power on or power off the device and another one to reset all money values. It will need to be electrically connect to a socket for its alimentation.

Project Diagram



Project Requirements Analysis

1. Sensors

In every coin slot we'll need a motion sensor that we allow use to know when a coin is put inside it. The sensor needs to be:

- To operate between 4.8V and 5V to be compatible with the Particle Photon card
- Have a low value of quiescent current
- Have a short detection time because the coin will move fast in the machine

The sensor that seems to correspond the most to our constraints is the: HC-SR501 Pyroelectric Infrared PIR Motion Sensor Modules.



Specification:

- Operating voltage range: DC 4.5-20V
- Quiescent Current: <50uA Trigger: L can not be repeated trigger/H can be repeated trigger(Default repeated trigger)
- Delay time: 5-200S(adjustable) the range is (0.xx second to tens of second)
- Block time: 2.5S(default)Can be made a range(0.xx to tens of seconds)
- Board Dimensions: 32mm*24mm
- Angle Sensor: <100 ° cone angle Lens size sensor:Diameter:23mm(Default)

2. The screens

The screen needs to be compatible with our photon card.

5V LCD with Blue Backlight (1602)



<https://www.openimpulse.com/blog/products-page/product-category/5-v-lcd-blue-backlight-1602/>

This 16 x 2 LCD with blue backlight was specially developed for low-power applications. Its standard operating voltage 5 V.

Specifications

- Input Voltage Range: 4.5 V to 5.5 V
- Supply Current: 1.5 mA
- Operation Voltage for LCD: 5 V
- Backlight Forward Current: 120 mA
- Backlight Forward Voltage Range: 4.1 V to 4.3 V

6. INTERFACE PIN CONNECTIONS

ITEM	SYMBOL	LEVEL	FUNCTIONS
1	VSS	0V	Power Ground
2	VDD	+5V	Power supply for logic
3	V0	—	Contrast adjust
4	RS	H/L	H:data L:command
5	R/W	H/L	H:read L:write
6	E	H.H→L	Enable signal
7-14	DB0-DB7	H/L	Data Bus
15	LEDA	+5V	Power supply for LED Backlight
16	LEDK	0V	

7. ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	MIN	TYPE	MAX	UNIT
Ta=25℃					
Logic Power	VDD	4.5	5	5.5	V
Input High Voltage	V _{HI}	2.2	—	VDD	V
Input Low Voltage	V _{IL}	-0.3	—	0.6	V
Output High Voltage	V _{OH}	2.4	—	VDD	V
Output Low Voltage	V _{OL}	0	—	0.4	V
Logic Current	I _{DD}	—	1.5	3.0	mA
Operation Voltage For LCD	V ₀ -GND	—	5	—	V