

Lists of components and suppliers

This file contains two lists of components, one for the final product and one for the prototype. We did this to fit the budget of 100 euros. The prototype will still be able to demonstrate the core features of the product. We cut back on cost by using a display that just shows the necessary information but will not have a full user interface with a touchscreen. Since the prototype will be a scaled down version of the final product, we are using a less powerful motor that is less expensive, and we can get away with a less powerful power supply that is also cheaper. We also can eliminate the step-down converter to power the electronics, since all the components will run on 5 volts on the prototype.

List of components and suppliers for the final product

Component	Quantity	Price without VAT (€)	Price with VAT (€)	Link
ESP32-CAM	1	11,95	14,70	https://www.ptrobotics.com/sensor-camera/7112-esp32-cam-wifi-and-bluetooth-module-w-camera-ov2640-2mp.html
FT232RL (USB to TTL Serial Converter)	1	12,52	15,40	https://pt.farnell.com/en-PT/adafruit-industries/284/adapter-ftdi-ft232rl-chip/dp/2364749
ili9341 (touchscreen)	1	23,96	29,47	https://pt.rs-online.com/web/p/kits-de-desarrollo-de-pantallas/7916378?gb=s
MCP23016 - i2c 16bit Expander	1	2,55	3,14	https://www.ptrobotics.com/digitais/1498-mcp23016-i2c-16bit-expander.html
passive buzzer	1	0,54	0,66	https://www.digikey.pt/en/products/detail/soberton-inc/WT-1205/479674
FPM10A (fingerprint sensor)	1	18,41	22,65	https://www.digikey.pt/en/products/detail/adafruit-industries-llc/4690/13170958
A4988 stepper driver	1	3,15	3,87	https://www.ptrobotics.com/impressao-3d/5829-a4988-stepper-motor-driver-module-with-heatsink-for-3d-printer-impressora-3d.html
stepper motor	1	10,73	13,20	https://pt.farnell.com/en-PT/dfrobot/fit0278/stepper-motor-1-8deg-5mm-bipolar/dp/3879694?st=pancake%20stepper%20motor
servo moter	2	10,98	13,50	https://www.digikey.pt/en/products/detail/adafruit-industries-llc/169/5154651

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2x40 Pin Bar for PCB	1	1,00	1,23	https://www.ptrobotics.com/headers-e-sockets/9969-barra-de-2x40-pinos-para-pcb-amarelo.html
AC/DC CONVERTER 12V 15W	1	8,68	10,68	https://www.digikey.pt/en/products/detail/mean-well-usa-inc/EPS-15-12/7703144
Voltage Regulator 5v	1	0,54	0,66	https://www.digikey.pt/en/products/detail/L7805CV/497-1443-5-ND/585964?curr=usd&utm_campaign=buynow&utm_medium=aggregator&utm_source=octopart
220 Ohm Resistor	1	0,09	0,11	https://www.digikey.pt/en/products/detail/stackpole-electronics-inc/CF14JT220R/1741346
MULTICOLOR BUTTONS (kit)	1	1,62	1,99	https://www.digikey.pt/en/products/detail/sparkfun-electronics/PRT-14460/7915747
LED RED	4	1,04	1,28	https://www.digikey.pt/en/products/detail/sunled/XLUR12D/4745846
Capacitor Ceramic 100µF	1	0,28	0,34	https://www.digikey.pt/en/products/detail/rubycon/35ZLH100MEFC6-3X11/3134256
BreadBoard	1	6,64	8,17	https://www.digikey.pt/en/products/detail/GS-830/BKGS-830-ND/5231309?curr=usd&utm_campaign=buynow&utm_medium=aggregator&utm_source=octopart
Jumper Wires Pack - M/M	1	1,93	2,38	https://www.digikey.pt/en/products/detail/PRT-12795/1568-1512-ND/5993860?curr=usd&utm_campaign=buynow&utm_medium=aggregator&utm_source=octopart
Jumper Wires Pack - M/F	1	1,93	2,38	https://www.digikey.pt/en/products/detail/PRT-12794/1568-1511-ND/5993859?curr=usd&utm_campaign=buynow&utm_medium=aggregator&utm_source=octopart
USB micro-B Cable - 6 Foot	1	3,41	4,19	https://www.digikey.pt/en/products/detail/3025013-06/Q855-ND/4341884?curr=usd&utm_campaign=buynow&utm_medium=aggregator&utm_source=octopart
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Washer D6	1	2,11	2,59	https://www.leroymerlin.pt/produtos/canalizacao/acessorios-de-canalizacao/vedantes-e-manutencao/20-anilhas-standers-extra-larga-zinco-d6-82583113.html?src=clk
Screws M4*25	2	0,51	0,63	https://www.leroymerlin.pt/produtos/ferragens/ferragens-de-fixacao/parafusos/1-kit-de-2-parafusos-4x25-mm-2-parafusos-4x50-mm-em-ferro-preto-vintage-00t2-87493783.html

PLA plastic for all the 3D printed parts (1 Kg)		13,01	16,00	Provided by supervisors
Acrylic sheet/plank 500*500*4mm	1	13,00	15,99	https://www.leroymerlin.pt/produtos/madeiras-e-acrilicos/vidros/acrilico-e-vidro-sintetico/placa-de-acrilico-u-v-transparente-500x500x4mm-81902623.html?src=clk
Snap Ring 3mm	1	0,47	0,58	https://www.leroymerlin.fr/produits/quincaillerie/corniere-tube-tole-et-profile/accessoires-de-mecanique/circlip/circlips-exterieur-de-3-inox-din-471-88274123.html

VAT	23%		
Total		151,05	185,79

List of components and suppliers for the prototype

Component	Quantity	Price without VAT (€)	Price with VAT (€)	Link
ESP32-CAM	1	9,34	11,49	DFR0602 DFRobot Mouser Portugal
FT232RL (USB to TTL Serial Converter)	1	5,50	6,77	https://www.ptrobotics.com/conversores/6240-modulo-conversor-de-usb-em-ttl-5v-com-ic-ft232rl-para-arduino.html
DFRobot I2C LCD Screen	1	7,49	9,21	DFR0063 DFRobot Mouser Portugal
MCP23016 - i2c 16bit Expander	1	2,55	3,14	https://www.ptrobotics.com/digitais/1498-mcp23016-i2c-16bit-expander.html
passive buzzer	1	0,46	0,56	https://pt.mouser.com/ProductDetail/AATC/AC-1205G-N1LF?qs=uwxL4vQweFN%252BzrxGCnu8jw%3D%3D
FPM10A (fingerprint sensor)	1	15,08	18,55	4690 Adafruit Mouser Portugal
A4988 stepper driver	1	3,15	3,87	https://www.ptrobotics.com/impressao-3d/5829-a4988-stepper-motor-driver-module-with-heatsink-for-3d-printer-impressora-3d.html
stepper motor	1	6,05	7,44	MIKROE-1530 Mikroe Mouser Portugal

servo motor	2	5,69	7,00	MS-R-1.3-9 Olimex Ltd. Mouser Portugal
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2x40 Pin Bar for PCB	1	1,00	1,23	https://www.ptrobotics.com/headers-e-sockets/9969-barra-de-2x40-pinos-para-pcb-amarelo.html
AC/DC WALL MOUNT power supply 5V 15W	1	3,80	4,67	https://www.ptrobotics.com/fonte-de-alimentacao/6635-switching-power-supply-5v-3a.html
220 Ohm Resistor	1	0,18	0,22	https://pt.mouser.com/ProductDetail/KOA-Speer/CF1-2C221J?qs=qdOgYJ2iURWrrVcwhP2nBA%3D%3D
MULTICOLOR BUTTONS (10 pack)	1	0,67	0,82	TS02-66-55-BK-100-LCR-D CUI Devices Mouser Portugal
LED RED	4	0,81	1,00	Diffused LED - Vermelho 10mm Led Standard PTR001833 (ptrobotics.com)
Capacitor Ceramic 100µF	1	0,23	0,28	35ZLH100MEFC6.3X11 Rubycon Mouser Portugal
BreadBoard	1	2,43	2,99	BREADBOARD-1 Olimex Ltd. Mouser Portugal
Jumper Wires Pack - M/M	1	2,50	3,08	https://www.ptrobotics.com/jumper-wires/4103-jumper-wires-connected-6-m-m-pack-of-20.html
USB micro-B Cable - 6 Foot	1	0,00	0,00	We use our personal cable
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Washer D6	1	0,00	0,00	Not mandatory for the prototype
Screws M4*25	2	0,51	0,63	https://www.leroymerlin.pt/produtos/ferragens/ferragens-de-fixacao/parafusos/1-kit-de-2-parafusos-4x25-mm-2-parafusos-4x50-mm-em-ferro-preto-vintage-00t2-87493783.html
PLA plastic for all the 3D printed parts (500 g because 1/2 scale prototype)		6,50	8,00	Provided by supervisors
vidro sintético TRANSPARENTE plank 500*500*2mm	1	4,22	5,19	https://www.leroymerlin.pt/produtos/madeiras-e-acrilicos/vidros/acrilico-e-vidro-sintetico/placa-de-vidro-sintetico-transparente-500x500x2mm-81902608.html?src=clk
Snap Ring 3mm	1	0,00	0,00	Not mandatory for the prototype

VAT	23%		
Total ex shipping		78,16	96,14

TRANSPORTATION COST			
Provider	Order cost	Shipping fee	
Mouser	58,56	0,00	(free shipping over 50 euro)
PT-Robotics	23,76	5,23	
Leroymerlin	5,82	0,00	We will go to the store ourselves
shipping total		5,23	
Total inc shipping			101,37

Materials:

For the materials of the project we choose to 3D print every single part of the prototype except for the dome containing the reward. We would like to use PLA plastic to print our parts because it is cheap and it is more sustainable than common plastic. Moreover, PLA is a lightweight plastic with good mechanical strength and is 100% bio-based and biodegradable. At the moment we don't know how much PLA we'll need to make our prototype. We first need to define the dimensions of our prototype. For the dome, we thought about using plexiglass or glass. We think it's important for the dome to be transparent so that the kid can see the reward inside which will make him want to have it and therefore want to take his medication correctly to get it.