APRESENTAÇÃO PIC

4ª Reunião

20/03

WEBSITE

- https://forestfiredetection.online

LISTA DE MATERIAL

Lista de material PIC

Orçamento máximo	300,00 €	300,00 €
Custo total	244,18 €	244,18 €
Está abaixo do orçamento por	55,82 €	

Item	Descrição	Custo	Qtd.	Montante	Notas
Câmara térmica	MLX90640 Thermal Camera Breakout	78,94 €	2	157,88 €	https://www.digikey.pt/pt/products/detail/pimoroni-ltd/PIM365/9606191?utm_adgroup=&utm_source=google&utm_medium=cpc&utm_campaign=PMax_Product_All%20Products&utm_term=&productid=9606191&gad_source=1&gclid=CjwKCAiw48-vBhBbEiwAzoiZVPa7W61wiTXEHvJxAY84PvHmv09IwFUcJnEs2HY8FVI
ESP32	ESP32 2.4GHz Dual-Mode WiFi and Bluetooth Development Board	12,18 €	3	36,54 €	https://www.otrobotics.com/wi1/7074-esp32-24ghz-dual-mode-wi1-and-bluetooth-development-board.html
Breadboard		3,69 €	1	3,69 €	https://www.otrobotics.com/breadboards/3090-breadboard-400-points-branco.html
Jumper Wires	Connected 6" M/M Pack of 20	3,08 €	1	3,08 €	https://www.otrobotics.com/jumper-wires/4103-jumper-wires-connected-6-m-m-pack-of-20.html
Socket 5pin	PCB Socket 5Pin Single Row	0,18 €	2	0,36 €	https://www.otrobotics.com/headers-e-sockets/3260-pcb-socket-5pin-single-row.html
Jumper Wires	20cm F/F Pack of 10 Random Color	2,71 €	1	2,71 €	https://www.otrobotics.com/jumper-wires/2610-jumper-wires-premium-20cm-f-f-pack-of-10-random-color.html
Computador				0,00 €	
Kit de soldadura				0,00 €	
Pilha	9V	9,90 €	1	9,90 €	https://www.digitfoto.pt/VARTA-Pilha-Lithium-9V-rVARTA6122.html
Regulador tensão		9,23 €	1	9,23 €	do-adjustable-boost-step-up-converter-38-32v-to-125-35v-w-led-
Pistola ar quente		20,79 €	1	20,79 €	7655573?gad_source=1&gclid=CjwKCAiw48-vBhBbEiwAzoiZVPa7W61wiTXEHvJxAY84PvHmv09IwFUcJnEs2HY8FVI
barra cobre			1	0,00 €	
modelo drone	para o protótipo			0,00 €	
Total				244,18 €	

ORÇAMENTO PIC

Orçamento PIC

Orçamento máximo	**300,00 €**	300,00 €
Custo total	**244,18 €**	244,18 €
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ESP32	ESP32 2.4GHz Dual-Mode WiFi and Bluetooth Development Board	12,18 €	3	36,54 €	https://www.ptrobotics.com/wifi/7074-esp32-24ghz-dual-mode-wifi-and-bluetooth-development-board.html
Breadboard		3,69 €	1	3,69 €	https://www.ptrobotics.com/breadboards/3090-breadboard-400-points-branco.html
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Kit de soldadura					
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Pilha	9V	9,90 €	1	9,90 €	https://www.digitfoto.pt/VARTA-Pilha-Lithium-9V-rVARTA6122.html
Regulador tensão		9,23 €	1	9,23 €	dc-adjustable-boost-step-up-converter-38-32v-to-125-35v-w-led-
Pistola ar quente		20,79 €	1	20,79 €	7655573?gad_source=1&gclid=CjwKCAjw48-vBhBbEiwAzqrZVFs7W61wl7XEHvJxAY84PvHtnv09lwFUcJnEs2HY8FV
barra cobre			1	0,00 €	
modelo drone	para o protótipo			0,00 €	
Total				244,18 €	

PROVA DE CONCEITO

Comunicação ESP32	Taxa de dados	Frequência MHz	Poder de transmissão	Sensibilidade recetor (dBm)
Wi-Fi 11n,HT20	150,0 Mbps	2448	13 dBm	-93
Wi-Fi 11n,HT40	300,0 Mbps	2448	13 dBm	-90
Wi-fi 11b, 11 Mbps	11b, 11 Mbps	2448	19.5 dBm	–88

MLX90640	Taxa de atualização(fps)	Total Pixeis	Bits por pixel	Total bits
câmara térmica	64	768	16	12288
	Total Transmissão de bps	Mbps	Consumo(mA)	Peso(g)
	786432	0,786432	20	4

Resumo				
Prova de conceito	Transmissão de dados(Mbps)	Autonomia(h)		
ESP32	11	16		
MLX90640	0,786432	16		
Drone	Tempo máximo de voo	Alcance máximo	Peso	peso componentes
DJI Mavic 3 Classic	46 minutos	30km	895g	140,3

PROVA DE CONCEITO

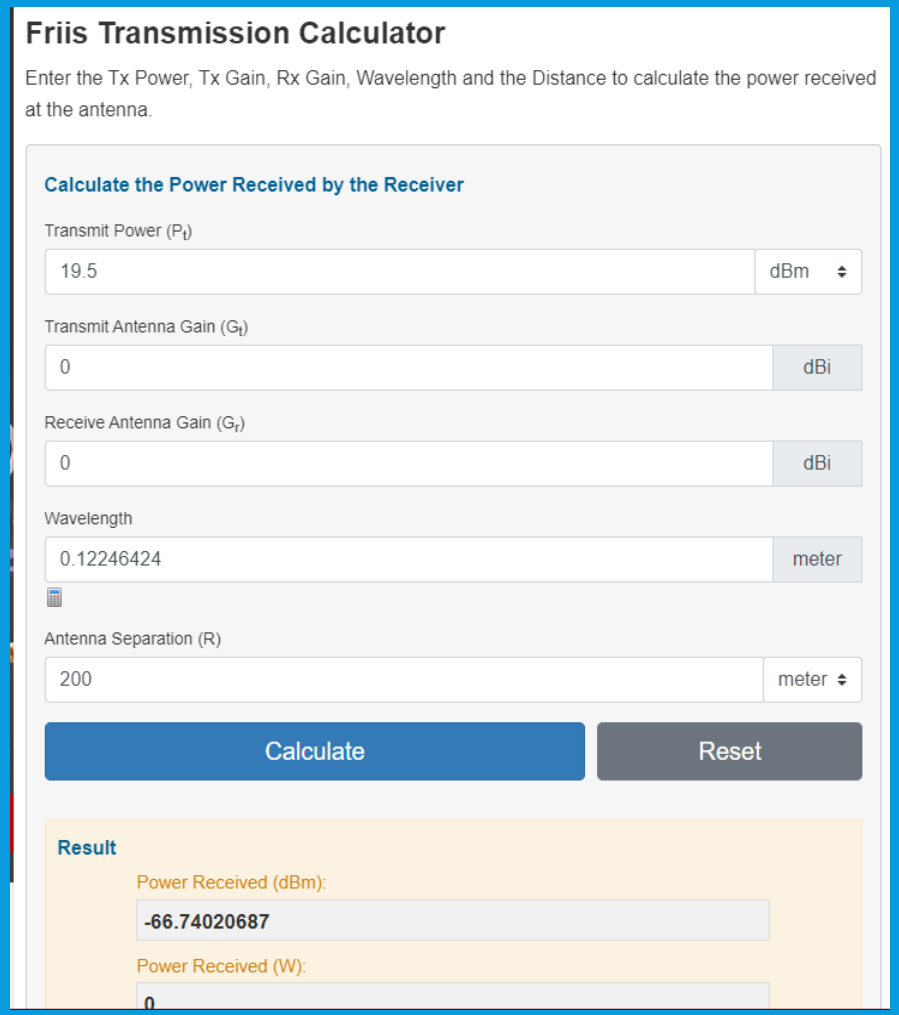
4.6 Wi-Fi Radio

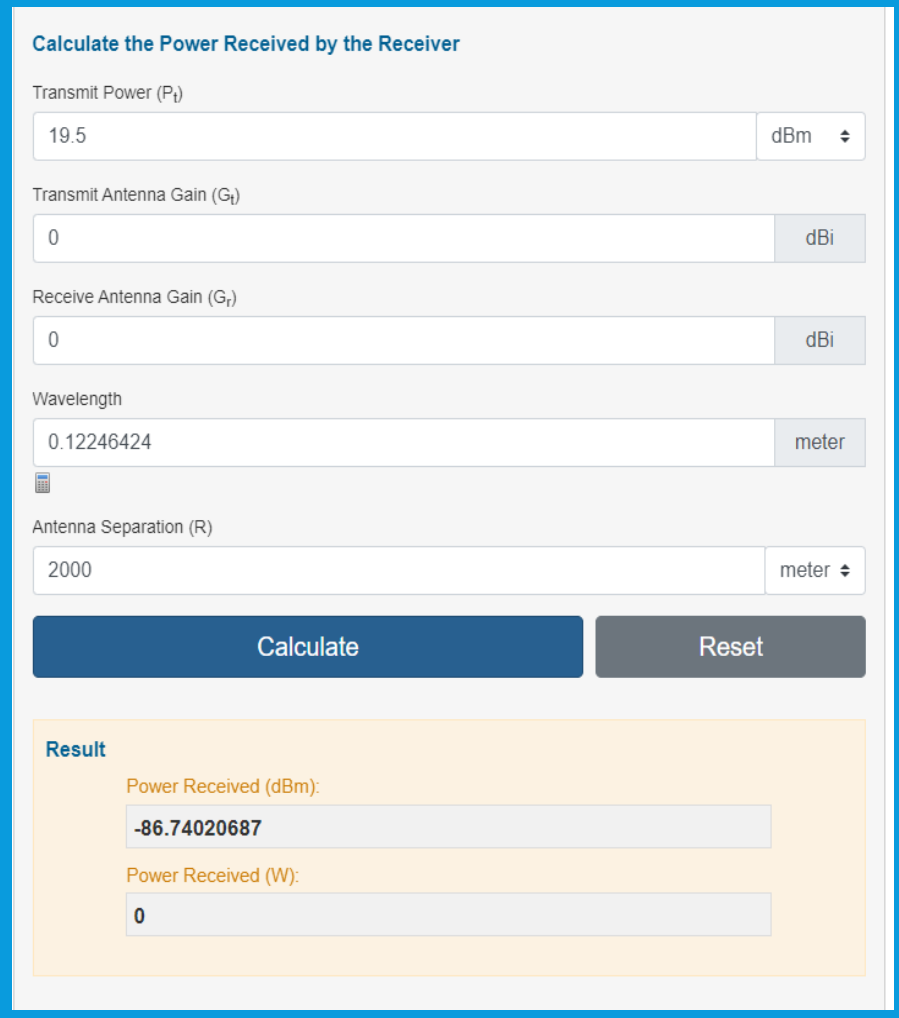
Table 4-6. Wi-Fi Radio Characteristics

Parameter	Description	Min	Typ	Max	Unit
Operating frequency range [note1]	—	2412	—	2484	MHz
Output impedance [note2]	-	-	*note 2*	—	Ω
TX power [note3]	11n, MCS7	12	13	14	dBm
	11b mode	18.5	19.5	20.5	dBm
Sensitivity	11b, 1 Mbps	—	–98	—	dBm
	11b, 11 Mbps	—	–88	—	dBm
	11g, 6 Mbps	—	–93	—	dBm
	11g, 54 Mbps	—	–75	—	dBm
	11n, HT20, MCS0	—	–93	—	dBm
	11n, HT20, MCS7	—	–73	—	dBm
	11n, HT40, MCS0	—	–90	—	dBm
	11n, HT40, MCS7	—	–70	—	dBm
Adjacent channel rejection	11g, 6 Mbps	—	27	—	dB

PROVA DE CONCEITO

Friss





PROJETO IDEAL

	Peso máximo suportado (kg)	Peso (kg)	Distância máxima(km)	Tempo máximo (h)
Drone	30		16	6
Câmara		20		
Transmissor		0.2 (sem antenas)		
Bateria		6.5		

	Frequência (MHz)	Tipo de transmissão	Distância máxima (km)
Transmissor	800 / 1400 / 2400	LTE wireless communication	17

Image Sensor	InSb Cooled Thermal Imager, 30Hz
Resolution	640×512
Pixel Pitch	15μm
Lens	19-275mm Continuous Zoom
Focus	Motorized Autofocus
Field of View	28.4º - 2.0º Horizontal FOV
Pixels Per Meter	18.3ppm
Image Optimizations	AGC, EIS, Denoise
Digital Zoom	4X Digital Zoom
Spectral Range	3000-5000nm
Thermal Sensitivity	25mK

SIMULAÇÃO

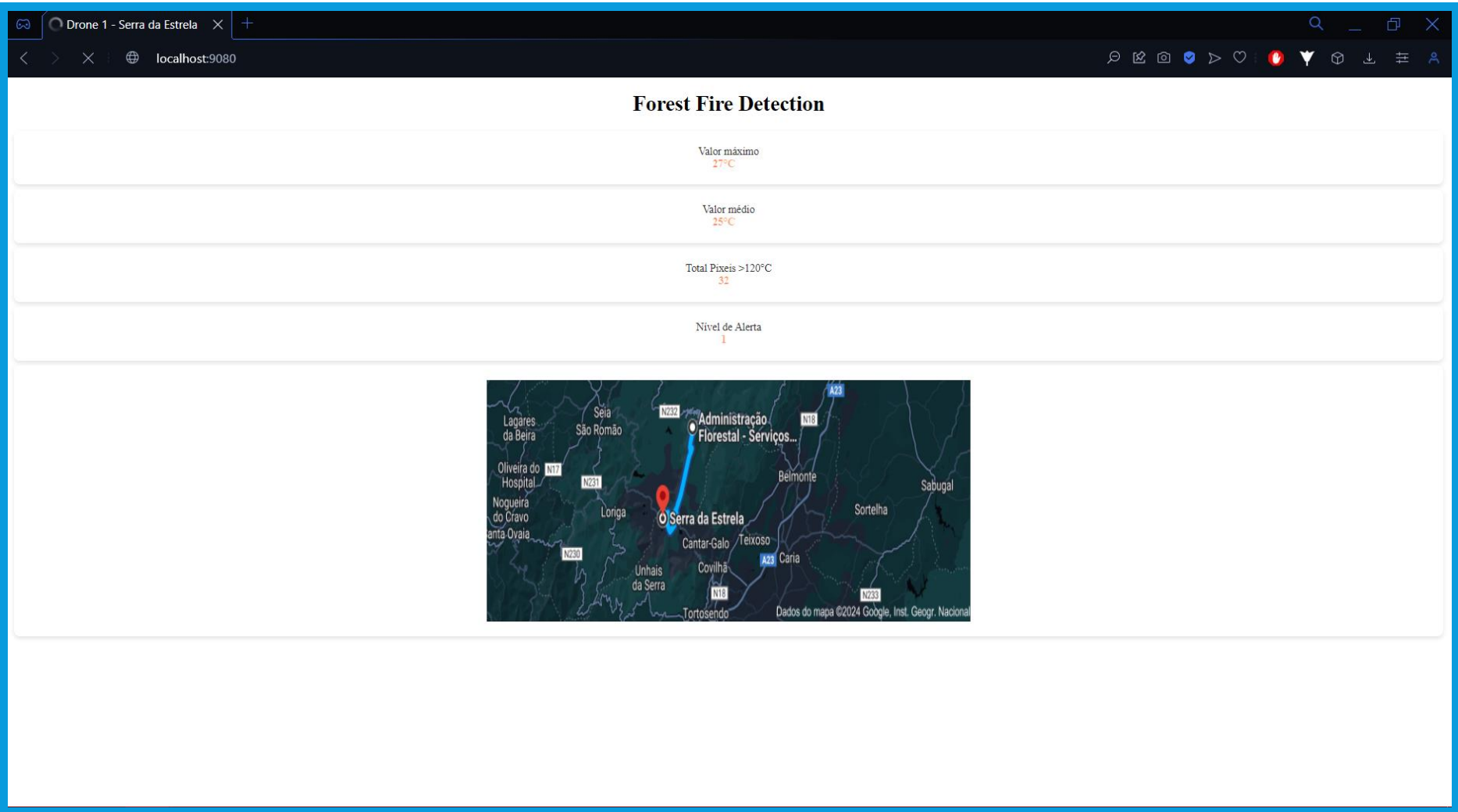

Drone 1 - Serra da Estrela
localhost:9080
Forest Fire Detection
Valor máximo
27°C
Valor médio
25°C
Total Pixeis >120°C
32
Nível de Alerta
1
Administração Florestal - Serviços...
Serra da Estrela
Lagares da Beira
Seia
São Romão
Oliveira do Hospital
Nogueira do Cravo
Loriga
Belmonte
Sabugal
Sortelha
Cantar-Galo
Teixoso
Covilhã
Caria
Unhais da Serra
Tortosendo
A23
N232
N18
N17
N231
N230
N233
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DIAGRAMA DE BLOCOS