



# Open Hardware for Industry 4.0

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# \$whoami



Tsvetan Usunov, owner of OLIMEX Ltd.

A company which deals with electronic design and electronic products production.

All our products are designed and manufactured in Bulgaria.

We produce Development boards, Programming tools, Linux computers and IoT solutions.

Many of our products are with Open Source Hardware Licensee.

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# What is FOSS

Software released under  
Open Source Licensee.

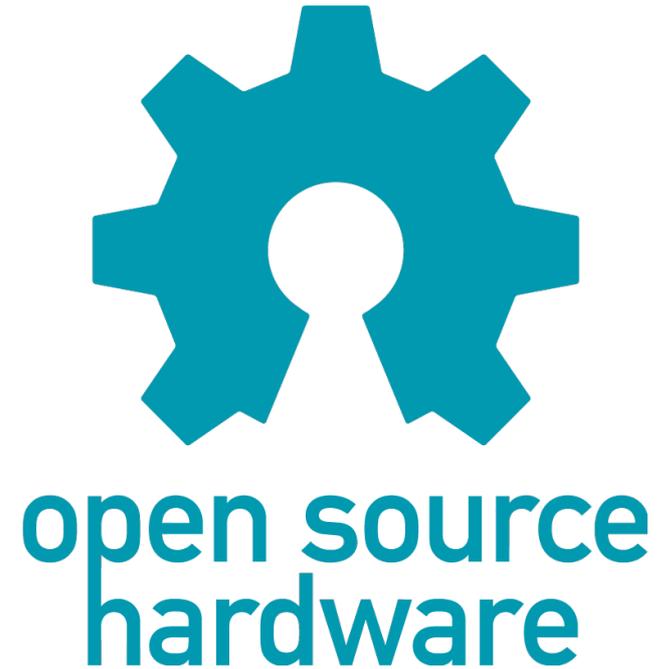
Anyone is licensed to to use, copy,  
study, and change the software in any  
way, and the source code is openly  
available.



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# What is OSHW

Open source hardware is hardware whose design is made publicly available so that anyone can study, modify, distribute, make, and sell the design or hardware based on that design.



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# Who benefits from OSHW?



Component vendors.

When design is freely available it's highly customized. Many products are designed which create high and long lasting demand.

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# Who benefits from OSHW?

Your customers!

- ✓ No vendor dependence
- ✓ Security for their business
- ✓ Long term availability
- ✓ Easy Customization
- ✓ Collaboration
- ✓ Better product
- ✓ Push prices low



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# What makes one OSHW project success?

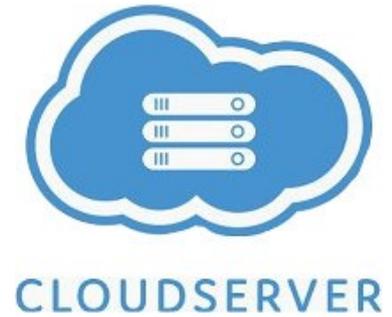


Community  
critical mass



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# OSHW solutions from OLIMEX



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# Wi-Fi



- ⊕ Easy installation
- ⊕ Low cost
- ⊕ Fast data transfer
- ⊕ No data transfer tax
- ⊖ Short range
- ⊖ Not Low Power
- ⊖ Pairing latency

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# LoRa



- ⊕ Easy installation
- ⊕ Low Cost
- ⊕ Low Power
- ⊕ Long Range
- ⊕ No data transfer tax
- ⊖ Slow data speed

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# Cloud server with OLinuXino



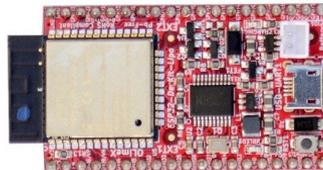
- ⊕ Low cost
- ⊕ Low power
- ⊕ Industrial  $-45+85^{\circ}\text{C}$
- ⊕ Robust design
- ⊕ GMAC, SATA, USB, HDMI, LCD, eMMC, GPIO, I2C, SPI, UART, CSI, MIPI, ADC, PWM
- ⊖ Humble Performance

# OSHW Wi-Fi solutions from

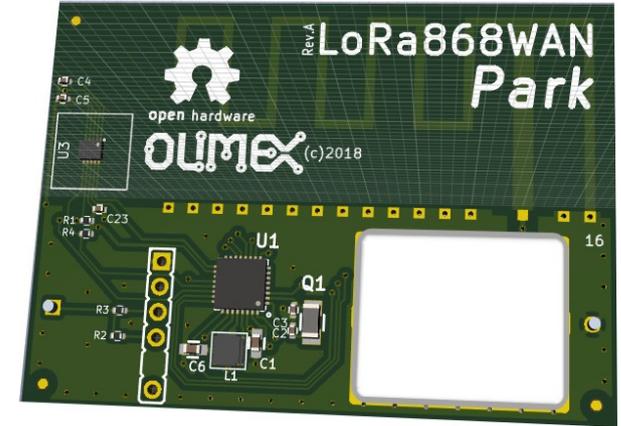
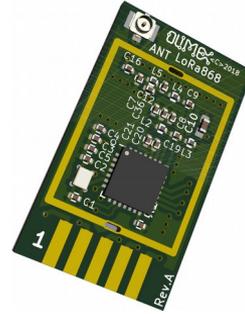
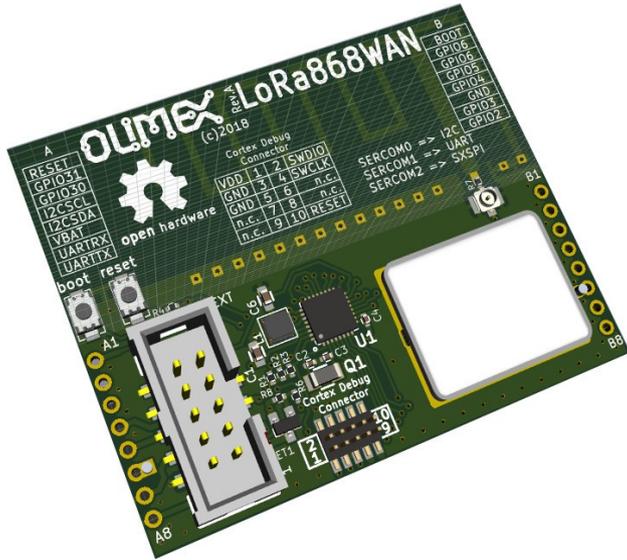


  
**wifi**

C++/Arduino  
microPython  
JavaScript  
ESP32 mesh

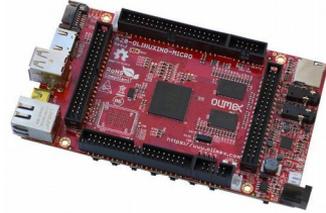


# OSHW LoRa solutions from



LoRaWAN, The things Network

# OSHW Linux Computers from OLIMEX



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# Other LPWAN technologies



- ⊕ Low cost
- ⊕ Low power
- ⊕ Long range
- ⊕ Good coverage
- ⊖ Subscription
- ⊖ Low speed

- ⊕ Low power
- ⊕ Long range
- ⊕ High speed
- ⊖ Subscription
- ⊖ Not mature
- ⊖ Rel high cost

- ⊕ Low power
- ⊕ Long range
- ⊕ -W -N -P
- ⊖ Not mature
- ⊖ Unknown cost

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# Summary

Using FOSS and OSHW solutions have lot of benefits for Industry 4.0

There are already WiFi, LoRa, Cloud-Server FOSS and OSHW solutions, new technologies are coming.

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# Questions?

OLIMEX



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