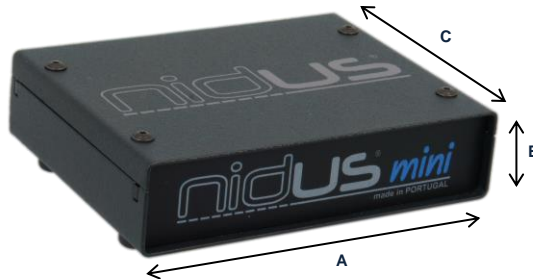
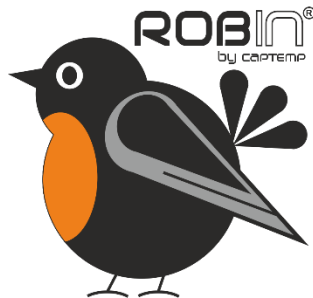


**Programmable 32 bits microcontroller – Hardware description**



Specifications	NIDUS-mini – Master board			
Size (mm) AxBxC	120 X 30 X 90 (mm)			
Mini PCI Express	1	ROBIN		
Battery	1	3,0 V	CR2032	lithium
Serial port	1	TTL	Programming / Serial port	
	2	RS232 / RS485		
Power supply		Vin = 9 - 24Vdc	P= 850mW	
Network protocols	TCP/IP, UDP/IP, SNMP, HTML, XML, PUSH/XML, AJAX, SMS and E-mail,			
Data logger	Data logger for more than 500.000 records			
RF Add-on				
RF module	1	1 TTL	433, 868 or 915 Mhz (ISM) wireless module	

Processor type  
(ROBIN)



Specifications
Microprocessor
Network Interface
Flash Memory (Code and File system)
Internal SRAM (Code and Data)
PSRAM
Mass Storage
General-Purpose I/O
Serial Ports
Real-Time Clock
Timers
Watchdog/Supervisor
Pulse Width Modulators
I2C
Power - with Ethernet
Operating Temperature
Encryption features
Supported Protocols
Humidity
Connectors - Headers
Board Size

ROBIN
<b>ESP32-D0WD, 2 low-power Xtensa<sup>®</sup> 32-bit LX6 microprocessors (80MHz up to 240MHz) 1 UltraLowPower (ULP) Coprocessor (8MHz)</b>
10/100Base-T With RJ-45 connector <b>WIFI 802.11 b/g/n (PCB and IPEX antenna)</b> <b>Bluetooth v4.2 BR/EDR and Bluetooth LE</b>
4/8/16 MB serial Flash
520 KB internal SRAM 8 KB of SRAM in RTC, which is called RTC FAST Memory and can be used for data storage 8 KB of SRAM in RTC, which is called RTC SLOW Memory
<b>8 MB PSRAM External SRAM can be mapped into CPU data memory space</b>
On-board serial Flash
<b>Up to 29 digital I/O through I2C I/O expander</b> <b>Up to 8 digital I/O directly connected to the microcontroller allowing for peripheral mapping</b>
<b>Up to 4 SPI/QSPI Interfaces</b> <b>Up to 1 I2S Interface</b> <b>Up to 3 UART Interfaces (1 reserved for programming)</b> <b>(These features are only available on pins directly connected to the microcontroller)</b>
Yes
<b>Four 64-bit timers with 16-bit prescallers</b>
Yes
1 16 channel LED PWM controller 1 Motor PWM controller with 6 outputs <b>(These features are only available on pins directly connected to the microcontroller)</b>
1 400Kbp/s / 100Kbp/s I2C interface
<b>≈ 150mA average with Wi-Fi enabled + 50mA for ethernet</b>
-40° C to +85° C
<b>Hardware AES, SHA and RSA</b>
HTTP, HTTPS, SSLv3, DHCP, UDP, TCP, SNMP, Telnet, FTP, TFTP, SMTP, POP3 <b>ASIO port, Modbus, MQTT, TLS, Local Control, Serial Slave Link, x509 Certificate Bundle, ICMP Echo, mDNS, Service, Mbed TLS, Websocket, SLIP, SNTP, MDNS, Coap, Cbor</b>
5% to 95%, non-condensing
52-pin Mini PCI Express RJ-45 10/100Base
(18 mm x31 mm x3.3 mm)

Programming environment
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- Visual Studio Code with the officially supported Espressif Integrated Development Framework (ESP-IDF) Extension [56]
  - Arduino IDE with the ESP32 Arduino Core
  - MicroPython A lean implementation of Python 3 for microcontrollers
  - Espruino – JavaScript SDK and firmware closely emulating Node.js
  - Lua Network/IoT toolkit for ESP32-Wrover [57]
  - Mongoose OS – an operating system for connected products on microcontrollers; programmable with JavaScript or C.
- A recommended platform by Espressif Systems, AWS IoT and Google Cloud IoT
- Mruby for the ESP32
  - NodeMCU – Lua-based firmware
  - Zerynth – Python for IoT and microcontrollers, including the ESP32