

# Moduino <sup>series</sup>

## Energy-efficient **ESP32-based** Industrial Automation Controller

**Moduino** is a lightweight, but powerful energy-efficient and fully capable automation controller series - an industrial computer for remote data control and management, equipped with latest **ESP32** compute module, wide range of serial, digital and analog inputs/outputs and wireless communication interfaces.

This cost effective solution is perfect for end-point devices. Moduino is powered by **ultra-low power Dual-Core Tensilica LX6 240 MHz** processor with **4MB pSRAM\*** and **4MB SPI flash** memory on-board. Integrated Wi-Fi/BLE modem and extra wireline/wireless interfaces make the Moduino micro-computer a versatile addition to Industrial IoT solutions offered by TECHBASE company.

**Moduino** devices can easily work remotely with existing **ModBerry gateway** for data accumulation and monitoring, to perform specific actions before sending the data to cloud services. The Moduino-ModBerry installation can work as standalone Ecosystem (for example via MQTT), providing fog-computing to any installation.

\* 512KB / 4MB RAM options available

## END-POINT SENSORS

The Moduino device is a comprehensive end-point controller for variety of sensors located throughout any installation. It fully supports temperature and humidity sensors and new ones are currently developed, e.g. accelerometer, gyroscope, magnetometer, etc.

## SOFTWARE & OS

Use of **ESP32-WROVER** compute module adds the support for **real-time operating systems** (compared to most Raspberry Pi based Linux and Windows OS versions), and openness of the Espressif's platform to Moduino industrial automation controller. Thanks to **enormous community of ESP32 and Arduino users and developers**, the Moduino can now adapt existing software solutions, tools and programming environments, for example:

- / **ESP-IDF** (Espressif IoT Development Framework)
- / **Zephyr Project** (scalable RTOS)
- / **Arduino** (C++)
- / **MicroPython**
- / **Mongoose OS**
- / etc.



## Moduino <sup>series</sup> FEATURES



### ESP32 MODULE

Energy-efficient compute module with real-time OS support incl. Zephyr Project, MicroPython, Arduino, etc.



### BATTERY POWERED

**Moduino X1** can be battery powered, making it perfect for remote installations and scattered objects monitoring



### WIRELESS COMMUNICATION

Available U.FL (IPEX) antenna connectors allows the **Moduino** device to increase the effective range of Wi-Fi / Bluetooth module and additional communication interfaces, e.g. LoRa, Sigfox, NarrowBand-IoT & more



### END-POINT SENSORS

Full support of temperature, humidity, pressure, accelerometer & light sensors with new ones in development, e.g. gyroscope, magnetometer, etc.



### SMALL SIZE

Dimensions of the device allows the use in limited space and difficult industrial environments

COST-EFFECTIVE & WIRELESS  
**INDUSTRIAL IoT**



## Moduino X1

## Moduino X2

	ESP32-WROVER	ESP32-WROVER
<b>Chipset:</b>	ESP32-WROVER	ESP32-WROVER
<b>Processor:</b>	Dual-Core Tensilica LX6 240 MHz, RTC	Dual-Core Tensilica LX6 240 MHz, RTC
<b>RAM:</b>	4 MB pSRAM*	4 MB pSRAM*
<b>Flash:</b>	4 MB SPI	4 MB SPI
<b>SD card:</b>	-	+ microSD slot
<b>RS-232/485:</b>	1x RS-232/485	2x RS-232/485
<b>Digital I/O:</b>	4x DIO (0 ~ 3V)	8x DIO (0 ~ 3V)
<b>Analog Input:</b>	2x AI	4x AI
<b>Analog Output:</b>	-	+ 2x AO (optional)
<b>Ethernet:</b>	-	+ 1x Ethernet 10/100 Mbps (optional)
<b>Wi-Fi:</b>	802.11b/g/n 16mbps	
<b>Bluetooth:</b>	Bluetooth v4.2 BR/EDR and Bluetooth Low Energy (BLE)	
<b>LoRa (option):</b>	Semtech LoRa transceiver SX1272, LoRaWAN stack, Class A and C devices	
<b>Sigfox (option):</b>	TI CC1125NarrowbandTransceiver, Class 0 devices, Sigfox pre-certified (January 2017)	
<b>LTE (option):</b>	Narrowband LTE UE categories M1/NB1, 34 bands supported from 699Mhz to 2690Mhz (Total worldwide support)	
<b>ZigBee (option):</b>	Compatible with IEEE 802.15.4, ZigBee 2007 / PRO	
<b>Ext. antenna:</b>	U.FL (IPEX) antenna connectors	
<b>Ext. modules:</b>	-	+ ExCard support
<b>Display:</b>	OLED 0.96" 128x64 (optional)	OLED 0.96" 128x64 (optional)
<b>Battery:</b>	Battery power support (optional)	UPS (LiPo or Supercapacitor) (optional)
<b>Power supply:</b>	5V or 9~30 V DC (depending on configuration)	5V or 9~30 V DC (depending on configuration)
<b>Casing:</b>	ABS or Aluminum, DIN rail mount	ABS or Aluminum, DIN rail mount
<b>Working cond.:</b>	-40 ~ 85°C, humidity 5 ~ 95% RH (no condensation)	-40 ~ 85°C, humidity 5 ~ 95% RH (no condensation)
<b>Dimensions:</b>	<b>ABS:</b> 90 x 36 x 32 mm (LxWxH) <b>Aluminum:</b> 95 x 35 x 41 mm (LxWxH)	<b>ABS:</b> 90 x 71 x 32 mm (LxWxH) <b>Aluminum:</b> 95 x 71 x 41 mm (LxWxH)

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