

Moduino ^{series}

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 ^{series} 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

WIRELESS COMMUNICATION

LoRa
Sigfox
GPRS/GPRS + GPS
LTE/LTE+GPS
LTE-NarrowBand-IoT
WMBus 169/868MHz
Z-Wave READY
ZigBee

Wi-Fi
Bluetooth

I/O EXTENSIONS

CAN
mBus 10
ExCARD 2/4x RS-232/485
ExCARD 12xDIO
ExCARD 8x AI
ExCARD 4xAI-PRO 24bit
ExCARD 12/8/4xAO
ExCARD 4xAO-PRO 16bit
ExCARD 4x Relay
ExCARD 1x Ethernet
DIO isolation
Accelerometer

BUILT-IN



OPTIONAL



SCREEN

OLED 0.96" 128x64

CASING

ALUMINUM
IP67 SEALED
ABS (default)



BATTERY

Battery Ready
Battery up to 3 years
UPS Supercap 1-15 min
UPS Li-Po 1-2 days

! Specifications is subject to change without notice. Some of the features are optional. Technical parameters should be confirmed in the order details.



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COST-EFFECTIVE & WIRELESS INDUSTRIAL IoT



Moduino X1

Moduino X2

Chipset:	ESP32*	ESP32*
Processor:	Dual-Core Tensilica LX6 240 MHz, RTC	Dual-Core Tensilica LX6 240 MHz, RTC
RAM:	4 MB pSRAM**	4 MB pSRAM**
Flash:	4 MB SPI	4 MB SPI
SD card:	-	+ microSD slot (optional)
RS-232/485:	1x RS-232/485	1x RS-232/485 (default) 2x RS-232/485 (optional)
Digital I/O:	4x DIO	8x DIO
• incl. DI:	0 ~ 30VDC	0 ~ 30VDC
• incl. DO:	Open Collector, max. Output Voltage 30VDC, max. Current 500mA. Protection: Over-Voltage 30VDC, peak min. 600W	
Analog Input:	2x AI (0 ~ 10VDC) (optional)	4x AI (0 ~ 10VDC) (optional)
Analog Output:	-	+ 2x AO 10bit (optional)
Ethernet:	1x Ethernet 10/100 Mbps (optional)	1x Ethernet 10/100 Mbps (optional)
CAN:	-	+ 1x CAN (optional)
Wi-Fi:	802.11b/g/n 16mbps	
Bluetooth:	Bluetooth v4.2 BR/EDR and Bluetooth Low Energy (BLE)	
WMBus (optional):	Wireless M-Bus 868 MHz and 169MHz band	
LoRa (optional):	Semtech LoRa transceiver SX1272, LoRaWAN stack, Class A and C devices	
Sigfox (optional):	TI CC1125NarrowbandTransceiver, Class 0 devices, Sigfox pre-certified (January 2017)	
LTE (optional):	Narrowband LTE UE categories M1/NB1, 34 bands supported from 699Mhz to 2690Mhz (Total worldwide support)	
ZigBee (optional):	Compatible with IEEE 802.15.4, ZigBee 2007 / PRO	
Ext. antenna:	U.FL (IPEX) antenna connectors (optional)	
Ext. modules:	+ ExCard / mBus module support	+ ExCard / mBus module support
Display:	OLED 0.96" 128x64 (optional)	OLED 0.96" 128x64 (optional)
Battery:	Battery power support (optional)	UPS (LiPo or Supercapacitor) (optional)
Power supply:	5V or 9~30 V DC (depending on configuration)	5V or 9~30 V DC (depending on configuration)
Casing:	ABS (default) or Aluminum (optional) , DIN rail mount	ABS (default) or Aluminum (optional) , DIN rail mount
Working cond.:	-40 ~ 85°C, humidity 5 ~ 95% RH (no condensation)	-40 ~ 85°C, humidity 5 ~ 95% RH (no condensation)
Dimensions:	ABS: 90 x 36 x 32 mm (LxWxH) Aluminum: 95 x 35 x 41 mm (LxWxH)	ABS: 90 x 71 x 32 mm (LxWxH) Aluminum: 95 x 71 x 41 mm (LxWxH)



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* also available with ESP32-WROVER/ESP32-WROVER-I
** 512KB / 4MB RAM options available

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