

# Moduino <sup>series</sup>

## Energy-efficient **PYCOM-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 **PYCOM** modules, 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 **8MB 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.

**PYCOM-based 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.

## 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, e.g. accelerometer, gyroscope, magnetometer, etc.

## SOFTWARE & OS

Use of **PYCOM** 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 platform to Moduino industrial automation controller. Thanks to **enormous community of PYCOM, ESP32 and Arduino users and developers**, the Moduino can now adapt existing software solutions, tools and programming environments, for example:

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



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



### PYCOM MODULE INSIDE

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

Wi-Fi  
Bluetooth

## SCREEN

OLED 0.96" 128x64

## 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

## CASING

ABS  
ALUMINUM  
IP67 SEALED

## BATTERY

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

 BUILT-IN

 OPTIONAL



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

# SPECIFICATION



## COST-EFFECTIVE & WIRELESS INDUSTRIAL IoT



### Moduino X1

### Moduino X2

Chipset:	<b>PYCOM ESP32</b>	<b>PYCOM ESP32</b>
Processor:	Dual-Core Tensilica LX6 240 MHz, RTC	Dual-Core Tensilica LX6 240 MHz, RTC
RAM:	4 MB pSRAM	4 MB pSRAM
Flash:	8 MB SPI	8 MB SPI
SD card:	-	+ <b>microSD slot (optional)</b>
RS-232/485:	1x RS-232/485	1x RS-232/485 <b>(default)</b> 2x RS-232/485 <b>(optional)</b>
Digital I/O:	4x DIO	8x DIO
• incl. DI:	2x DI ( optional 4x DI ), Protection: Over-Voltage 30VDC	4x DI ( optional 8x DI ), Protection: Over-Voltage 30VDC
• incl. DO:	2x DO, Open Collector, Protection: Over-Voltage 30VDC max. Current 500mA, peak min. 600W	2x DO, Open Collector, Protection: Over-Voltage 30VDC, max. Current 500mA, peak min. 600W 2x DO, typical max current 50mA
Analog Input:	2x AI (0 ~ 10VDC) <b>(optional)</b>	+ 4x AI (0 ~ 10VDC) <b>(optional)</b>
Analog Output:	-	+ 2x AO 10bit <b>(optional)</b>
Ethernet:	1x Ethernet 10/100 Mbps <b>(optional)</b>	1x Ethernet 10/100 Mbps <b>(optional)</b>
CAN:	-	+ 1x CAN <b>(optional)</b>
Wi-Fi (all):	802.11b/g/n 16mbps	
Bluetooth (all):	Bluetooth v4.2 BR/EDR and Bluetooth Low Energy (BLE)	
LoRa (LoPy, LoPy4, SiPy):	Semtech LoRa transceiver SX1272, LoRaWAN stack, Class A and C devices	
Sigfox (LoPy4, SiPy):	Semtech LoRa transceiver SX1272, 860-1000MHz, Class 0 devices	
NarrowBand-IoT (GPY SiPy):	Narrowband LTE UE categories M1/NB1, 34 bands supported from 699Mhz to 2690Mhz (Total worldwide support)	
Ext. antenna	SMA female antenna connectors <b>(optional)</b>	
Ext. modules:	+ <b>ExCard / mBus module support</b>	+ <b>ExCard / mBus module support</b>
Display:	OLED 0.96" 128x64 <b>(optional)</b>	OLED 0.96" 128x64 <b>(optional)</b>
Battery:	Battery power support <b>(optional)</b>	UPS (LiPo or Supercapacitor) <b>(optional)</b>
Power supply:	6~30 V DC (depending on configuration)	6~30 V DC (depending on configuration)
Casing:	ABS <b>(default)</b> or Aluminum <b>(optional)</b> , DIN rail mount	ABS <b>(default)</b> or Aluminum <b>(optional)</b> , DIN rail mount
Working cond.:	-40 ~ 70°C, humidity 5 ~ 95% RH (no condensation)	-40 ~ 70°C, humidity 5 ~ 95% RH (no condensation)
Dimensions:	<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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