TECHBASE
WE MAKE CONNECTIONS. SIMPLE

Moduino series

UNLEASH THE **TRUE POTENTIAL**
OF **INDUSTRIAL IoT**

INDUSTRIAL IoTReady

LTE NarrowBand IoT

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.

Bluetooth

sigfox

ZigBee

Wi Fi

LoRa

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 up to **8MB pSRAM*** and up to **16MB 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.

* 4MB / 8MB RAM options available

** 4MB / 8MB / 16MB Flash 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:

- **MicroPython**
- **Arduino** (C++)
- **ESP-IDF** (Espressif IoT Development Framework)
- **Zephyr Project** (scalable RTOS)
- **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

Optional SMA 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

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CONFIGURATION

INDUSTRIAL IoTReady

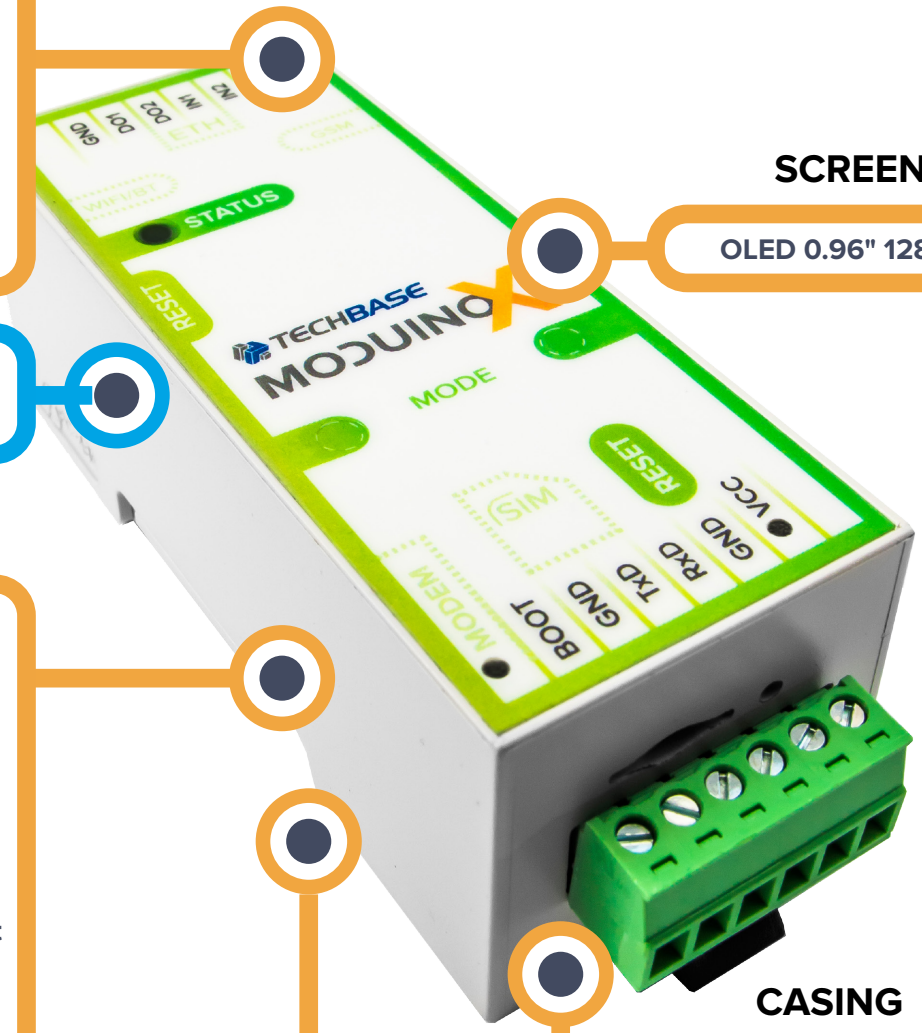
WIRELESS COMMUNICATION

- 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 8xDIO
- ExCARD 8x AI
- ExCARD 4xAI-PRO 24bit
- ExCARD 12/8/4xAO
- ExCARD 4xAO-PRO 16bit
- ExCARD 4x Relay
- ExCARD 1x Ethernet
- DIO opto-isolation
- Accelerometer



SCREEN

- OLED 0.96" 128x64

BATTERY

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

CASING

- ABS
- ALUMINUM
- IP65-IP67 SEALED

BUILT-IN

OPTIONAL

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SPECIFICATION

INDUSTRIAL IoTReady

COST-EFFECTIVE & WIRELESS INDUSTRIAL IoT

		Moduino X1	Moduino X2	Moduino X3
Chipset:		**ESP32-WROVER-B**	**ESP32-WROVER-B**	**ESP32-WROVER-B**
Processor:		Dual-Core Tensilica LX6 240 MHz, RTC	Dual-Core Tensilica LX6 240 MHz, RTC	Dual-Core Tensilica LX6 240 MHz, RTC
RAM:		4 / 8 MB pSRAM	4 / 8 MB pSRAM	4 / 8 MB pSRAM
Flash:		4 / 8 / 16 MB SPI	4 / 8 / 16 MB SPI	4 / 8 / 16 MB SPI
SD card:		-	+ **microSD slot (optional)**	+ **microSD slot (optional)**
RS-232/485:	T1	1x RS-232/485	T1 1x RS-232/485 **(default)** + **2x RS-232/485 (optional)**	T1 1x RS-232/485
Inputs:	T2	2x DI (surge protection: 30VDC) or 2x AI (0 ~ 10VDC)	T2 2x DI (surge protection: 30VDC) or 2x AI (0 ~ 10VDC)	T2 2x DI (surge protection: 30VDC) or 2x AI (0 ~ 10VDC)
	T3	-	T3 + **2x DI** (surge protection: 30VDC)	T3 + **2x DIO OPTO** or **2x Relay (optional)**
Outputs:	T2	2x DO Open Collector (surge protection: 30VDC) max. Current 500mA, peak min. 600W	T2 2x DO Open Collector (surge protection: 30VDC) max. Current 500mA, peak min. 600W	T2 2x DO Open Collector (surge protection: 30VDC) max. Current 500mA, peak min. 600W
	T3	-	T3 + **2x DO**, typical max current 50mA or **2x AO 10bit**	T3 **2x DO**, typical max current 50mA or **2x AO 10bit**
Ethernet:		1x Ethernet 10/100 Mbps **(optional)**	1x Ethernet 10/100 Mbps **(optional)**	1x Ethernet 10/100 Mbps **(optional)**
CAN:		-	+ **1x CAN (optional)**	-
USB:		-	+ **1x microUSB 2.0**	-

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:	SMA female antenna connectors **(optional)**

	Moduino X1	Moduino X2	Moduino X3
Ext. modules:	**max. 1x ExCard module (optional)**	+ **max. 3x ExCard module (optional)**	+ **max. 2x ExCard module (optional)**
Battery:	Battery power support **(optional)**	UPS (LiPo or Supercapacitor) **(optional)**	UPS (LiPo or Supercapacitor) **(optional)**
Display:	OLED 0.96" 128x64 **(optional)**		
Power supply:	6~30 V DC (depending on configuration)		
Casing:	ABS **(default)** or Aluminum **(optional)**, DIN rail mount		
Working cond.:	-40 ~ 70°C, humidity 5 ~ 95% RH (no condensation)		
Dimensions:	**ABS (2M):** 90 x 36 x 32 mm (LxWxH) **Aluminum:** 95 x 37 x 41 mm (LxWxH)	**ABS (4M):** 90 x 71 x 32 mm (LxWxH) **Aluminum:** 95 x 73 x 41 mm (LxWxH)	**ABS (4M):** 90 x 71 x 32 mm (LxWxH) **Aluminum:** 95 x 73 x 41 mm (LxWxH)

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