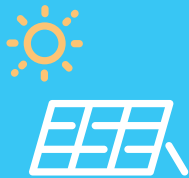


# Upgrade your installations with newest Raspberry Pi 4

Our device **ModBerry M500** is now available with latest, third gen. **Raspberry Pi 4 Model B**. Upgraded **ModBerry M500** device offers higher performance, thanks to quad-core **Cortex A72** processor with higher computing frequency, up to 4x more RAM and revised Gigabit Ethernet. **ModBerry M500** maintains low power consumption and optimal price of this solution.



**NEW RASPBERRY PI 4**

## Features of new ModBerryM500

Broadcom **BCM2711B0** quad-core 64-bit ARM Cortex-A72 @**1,5 GHz**

**2/4 GB** LPDDR4 RAM

WiFi Dual Band 802.11 ac 2,4GHz & **5GHz** + **Bluetooth 5.0**

HDMI 2.0 up to 4K @ 60Hz  
**H.265 4kp60, OpenGL ES 3.X**

**10/100Mb + 1Gb** Ethernet interface  
**2x USB3.0** interface

**Power over Ethernet**  
with an additional overlay

# ModBerry M500<sup>r</sup> series

Programmable automation controller (PAC)



ModBerry M500 is the newest series of industrial computers which you can easily adapt to your needs by choosing from the available options.

Energy-efficient **ARM Cortex-A72** processor @1.5GHz

**2/4 GB RAM** and optional **8GB microSD** memory

Rich set of I/O interfaces: including **digital and analog inputs/outputs, RS-232/RS-485 serial ports**

Economic **1-Wire bus, Gigabit Ethernet** and **USB 3.0**

Expandable resources: **LTE/3G, WiFi, ZigBee, Bluetooth**



Designed for the needs of automation, telecommunications, remote supervision, and monitoring

Fully configurable platform - you can setup hardware options of your device

Full range of communications interfaces, including LTE/3G modem

Standard protocol support (e.g. MODBUS, SNMP, M-Bus), possibility to install dedicated user protocols

Web page visualization of current/archived data and remote control directly from the device or cloud service

## Available hardware options

**Serial ports:** 2x RS-232/485

**Digital inputs/outputs:**  
4x Digital input, 4x Digital output

**Analog inputs:**  
4x Analog input (optional)

**Communication interfaces:**  
1x Gb Ethernet, 1x 10/100Mbps Ethernet, 1-Wire,  
2x USB 3.0, 1x USB 2.0, CAN (optional)

**Audio/Video:** up to 2x microHDMI

**Expansion cards:**  
Wi-Fi, ZigBee, LTE/3G/GPRS/EDGE, Bluetooth,  
GPS, ExCard I/O Modules

## Software properties

New firmware based on Linux Kernel 4.x guarantees stability and security of operation

Expansion modules to increase the amount of available interfaces (see accessories section)

Ready tools and pre-compiled packs, including C/C++, JAVA, SQL, PHP, SSH and VPN support

Developer tools and support, instructions, informational materials

Remote software updates

Available upgrade to innovative iMod software platform

iModCloud – dedicated cloud computing service for telemetry, remote control and data sharing

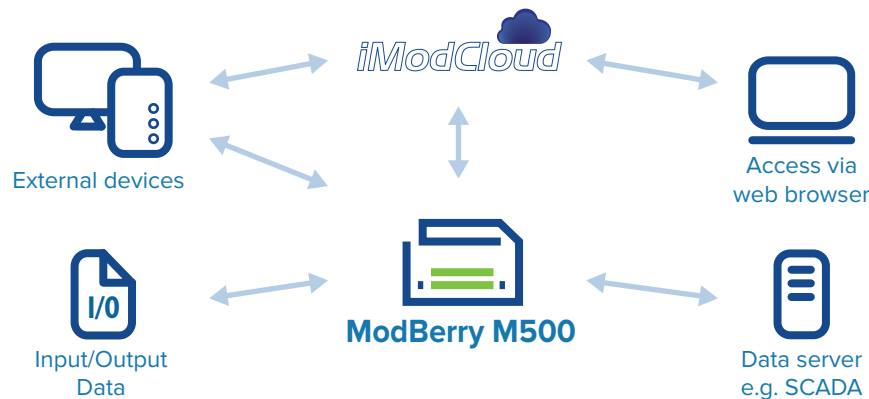
Full technical support through a dedicated portal, project cooperation via TECHBASE Solution Partner

Typical method of use (3 functions: C-L-V)

**Protocol and interface conversion (Convert)** - data is collected from input interfaces, converted and transmitted to output interfaces, e.g. 3G/GPRS, external modules

**Data logger (Log)** - archiving and sharing data in a file format, database or with the use of external systems (SCADA or dedicated iModCloud)

**Access via WWW (Visualize)** - data is presented directly from the device or with dedicated cloud computing services (iModCloud)



## ModBerry M500 can perform following functions:

- PLC
- Telemetry module with data logger
- Serial port server
- Protocol and interface converter
- Programmable controller
- LTE/3G/GPRS/EDGE modem
- MODBUS Gateway/Router
- SNMP Agent
- Web server with PHP and SQL database support
- SMS Gateway
- LTE/3G/GPRS router, NAT
- E-mail server, FTP, SSH, VPN

## Features of adaptation to industrial conditions:

- Low energy consumption
- RTC Battery-powered Real Time Clock (RTC)
- WatchDog function ensures hardware operation control of selected services
- Effective file systems used for FLASH memory, ensuring long, failure-free operation
- Compact, durable housing made from ABS plastic, adapted to installation on a DIN bus
- Easy installation due to the use of disconnectable screw terminals
- No moving elements (fans, platter disks)
- Versions with extended operating temperature range: 0 ~ 65°C

## LTE/3G/GPRS/EDGE modem\*

Modem for data LTE/3G/GPRS data transmission and SMS support. ModBerry has unique hardware-software features providing connection efficiency and economy:

The device is equipped with Watchdog mechanism to ensure modem stability.

Pre-installed software for constant verification of LTE/3G/GPRS connection and GPRS reconnect function.

Multiplexing server provides 3 independent modem communication channels. Allows sending and receiving of SMS during LTE/3G/GPRS transmission.

You can use telemetry SIM cards with dynamic IP addresses due to the use of DynDNS. VPN or iModCloud technology allows use of cards with non-public IP.

\* GPRS/EDGE are supported by LTE/3G modem

**iMod** - an innovative software platform allowing for fast start-up and full exploitation of device capabilities without the need for writing programs. A fully configurable system reflecting typical C-L-V use (see clarification above). In order to learn more about the iMod platform, visit the page: [www.techbase.eu/imod](http://www.techbase.eu/imod)

iModCloud is a Software as a Service (SaaS) that fully controls iMod devices. Together stand as a complete solution ecosystem – **iModCloud Ecosystem**. In other words – it is a combination of a cloud service with a web user interface and special industrial devices that are fully manageable remotely.



### READY-TO-USE

iModCloud is ready-to-use set of components that can be adjusted to any remote monitoring and control system



### REMOTE CONTROL

User interface of the system is accessible from any place of the world through web browsers of desktops and mobile devices

**PLC** - software for creation of algorithms in the ladder system with the capability of operation on ModBerry device, services the MODBUS protocol

### Expanded developer's platform, additional software packs:

**GPRS** - facilitating management of the 3G/GPRS connection and containing the functionality of monitoring connection status and DynDNS service

**SMS** - allows sending and receiving text messages

**APACHE** - HTTP server pack, enabling device access from web browser

**PYTHON/RUBY/JAVA/PHP** - packs allowing creating, development and start-up of applications in many programming languages

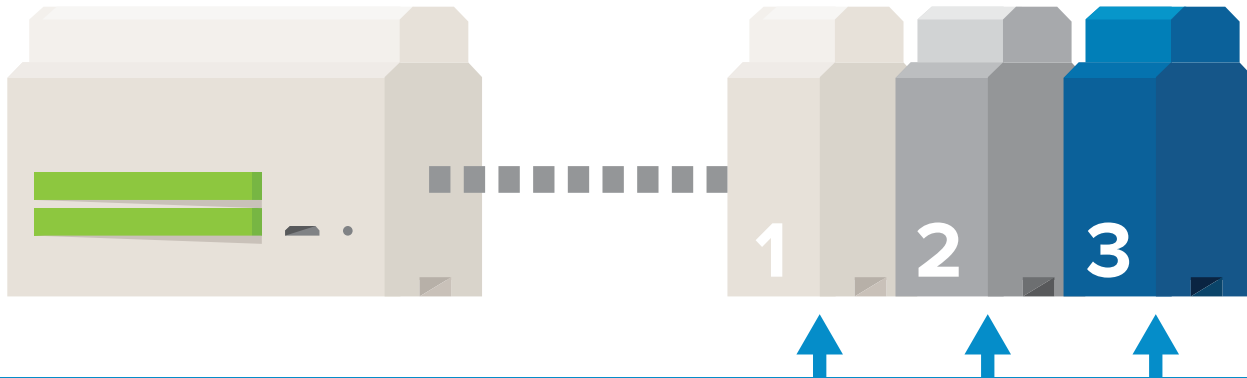
**PostgreSQL, MSSQL, SQLite** - tools for database management

**Open VPN** - enables creating a connection, allowing communication between devices located in different networks, providing very high level of security

**SSH** - enables remote connection with device while maintaining high level of security

**GPS** - allows the location of the device, traffic monitoring for the unit and time synchronization

The **ModBerry M500** device allows use of up to 3 expansion modules, increasing its capabilities with additional I/Os, providing support for additional modems and wireless communication modules, and adding new features such as accelerometer and opto-isolation.



## INTERNAL EXTENSION MODULES

<b>ExCard 4RS</b>	2x or 4x RS232/485 ports
<b>ExCard ETH</b>	1x or 2x Ethernet ports
<b>ExCard EXP</b>	1x PCI-Express slot ( <b>modem and communication interfaces support</b> )
<b>ExCard AI</b>	8x analog input AI or 4x analog input AI dual mode
<b>ExCard AO</b>	12/8/4x analog output AO
<b>ExCard 4R</b>	4x relay
<b>ExCard DIO</b>	12x digital input/output DIO
<b>ExCard AK</b>	Accelerometer
<b>ExCard OP</b>	Opto-isolation for power supply and i <sup>2</sup> c serial bus ( <b>ExCard AI/AO/4R/DIO/AK</b> )
<b>mBus10</b>	M-Bus interface to RS232 or RS485 converter ( <b>up to 10 SLAVE devices</b> )
<b>mBus60</b>	M-Bus interface to RS232 or RS485 converter ( <b>up to 60 SLAVE devices</b> )
<b>mBus400</b>	M-Bus interface to RS232 or RS485 converter ( <b>up to 400 SLAVE devices</b> )

## INTERNAL MODEMS

<b>Wi-Fi</b>	Wi-Fi Standard 802.11 b/g/n
<b>Bluetooth</b>	Bluetooth 4.0
<b>ZigBee</b>	ZigBee modem
<b>GPS</b>	GPS receiver
<b>GPRS/GPS</b>	GPRS/GPS modem
<b>GPRS/Bluetooth</b>	GPRS/Bluetooth 3.0 modem
<b>3G/GPS</b>	3G/GPS modem
<b>LTE/3G/GPRS</b>	LTE/3G/GPRS modem
<b>GPRS/EDGE/NB-IoT</b>	NarrowBand-IoT (LTE cat. NB1) modem, backwards compatible with GPRS/EDGE
<b>LoRa</b>	LoRa modem
<b>Wireless M-Bus</b>	Low power Wireless M-Bus modem (169 MHz or 868 MHz band)

 For availability of specific device configurations, modules compatibility and maximum capabilities of expansion modules, please contact the TECHBASE Group sales department.

## SYSTEM

CPU	ARM Cortex-A72 (64-bit) quad-core 1,5 GHz
RAM	2/4 GB
SD memory (microSD)	8 GB <b>(optional)</b>
Operating system	Linux 4.x
Real Time Clock	RTC, 240 byte SRAM, Watch Dog Timer

## ETHERNET INTERFACE

1x 10/100/1000 Mbps, 1x 10/100Mbps (RJ45 connector)

## SERIAL PORTS

RS-232 / RS-485 ports 2x RS-232/485

## USB PORTS

2x external USB 3.0, 1x external USB 2.0 (host)

## INPUTS / OUTPUTS

Digital inputs (DI)	4x DI (0..30V DC)
Digital outputs (DO)	4x DO (0..30V), max. power efficiency: 500 mA
Analog inputs (AI)	4x AI - range (0..10V) DC (18-bit resolution) <b>(optional)</b>
CAN	1x CAN <b>(optional)</b>
1-Wire	1x 1-Wire

## WIRELESS MODEMS (ON-BOARD)

WiFi Dual Band 802.11 ac 2,4GHz & 5GHz, Bluetooth BLE 5.0

## POWER SUPPLY

10 ~ 30 V DC, 1000 mA

## MECHANICAL PARAMETERS

Dimensions	35 x 101 x 120 mm
Weight	300g
Casing	ABS, DIN rail mounting

## OPERATING AND STORAGE CONDITIONS

0 ~ 55°C, humidity 5 ~ 95% RH (no condensation)

Extended operating temperature: 0 ~ 65°C, humidity 5 ~ 95% RH (no condensation)\*

## AVAILABLE EXPANSION CARDS

Wi-Fi (IEEE 802.11 b/g/n, speed up to 150 Mbps, 64/128-bit WEP, WPA, and WPA2)  
 NarrowBand-IoT, LTE/3G modem, GPS module, ZigBee, Bluetooth, **ExCard modules**

## CONNECTORS AND PHYSICAL INTERFACES

2x16-pin screw terminal  
 1x RJ45 (1Gb Ethernet), 1x RJ45 (10/100Mbps Ethernet)  
 2x USB 3.0 type A, 1x USB 2.0 type A  
 1x microSD CARD slot, 1x SIM CARD slot **(optional)**  
 2x microHDMI, 1x Audio/Video 3.5mm jack

## MANUFACTURER

TECHBASE Group Sp. z o.o., Gdynia, Poland

\* Altho the processor specified to work in -40 ~ 80°C, we cannot guarantee a cold start of the cooled components at temperatures below 0°C. With the optimal load of the interfaces and ensuring free heat emission in the casing, the device equipped with an extended temperature range operates at temperatures up to 65 °C.

## POWER FEEDERS

**SDK-0302-12VDC-R**

AC/DC power feeder, input 100-240V AC, output 12V DC 1000mA, cable endings in tube terminals

**MDR-20-24**

DIN bus power feeder, output 24V DC 24W, input 85..264 V AC or 120..370 V DC

## ANTENNAS

**ANT-GSM-1M**

GSM antenna with frequency 824-960MHz/1710-1910MHz/1920-2170MHz

## 1-WIRE SENSORS

**1Wire-Therm-Stainless**

Digital temperature sensor in steel housing

**1Wire-Therm-ABS**

Digital temperature sensor closed in ABS plastic housing

## M-BUS CONVERTERS

**mBus 10**

The mBus 10 is a transparent converter from RS-232 or 485 to M-Bus interface

**mBus 400**

The mBus 400 is a transparent converter from RS-232 or 485 to M-Bus interface. You can connect up to 400 devices (slaves).

## ZIGBEE SENSORS/MODULES

**ZS-10, ZS-20**

Multi-channel ZigBee Sensor with Battery Power Supply

**ZM-10, ZM-20**

ZigBee Relay I/O Module

## INPUT/OUTPUT EXPANSION MODULES

**NPEIO-6DIO**

Digital inputs/outputs expansion module with MODBUS RTU support

**NPEIO-4RO**

Relay outputs expansion module with MODBUS RTU support