

# ModBerry9500 M3<sup>+</sup> series

Programmable automation controller (PAC)



ModBerry 9500 M3 is the newest series of industrial computers which you can easily adapt to your needs by choosing from the available options.

Energy-efficient quad-core **Cortex A53 1.2GHz** processor

**1GB RAM** and up to **32GB** flash memory

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

Economic **1-Wire bus**

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



ModBerry 9500M3

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

**Configurable digital inputs/outputs**  
4x Digital input/output

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

**Communication interfaces:** Ethernet, 1-Wire, 2x USB

**Audio/Video:** HDMI (optional)

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

## Software properties

New firmware based on Linux Kernel 4.0+ 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

Updates for the innovative iMod platform

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

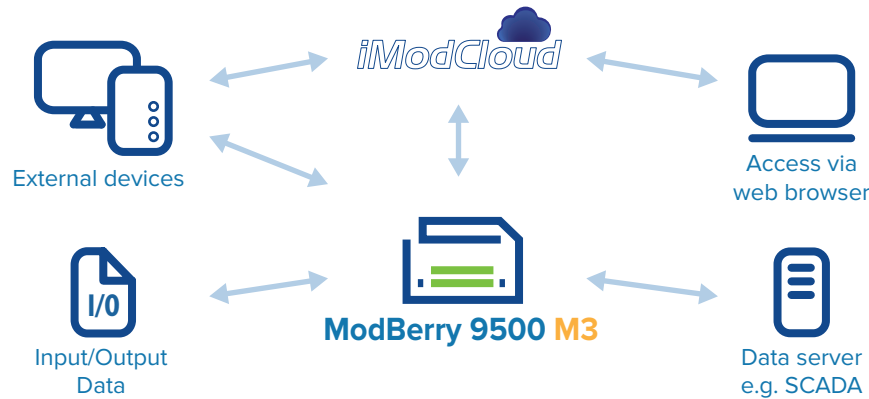
Full technical support through a dedicated portal, project cooperation via TECHBASE Solution Partner

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 9500 M3 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: -25 ~ 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

CORE

**ModBerry 9500 M3**

Quad-core Cortex-A53 1.2GHz  
1GB RAM, up to 32GB eMMC

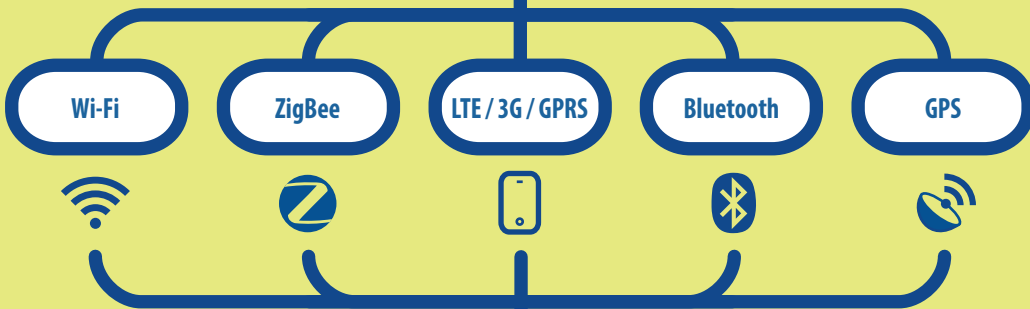
USB    Ethernet    RTC

CORE RANGE OF INPUTS / OUTPUTS

2x RS-232/485  
4x DI    4x DO  
4x DIO  
1x 1-Wire  
HDMI (optional)  
4x ADC (optional)

EXPANSION CARDS

Wi-Fi    ZigBee    LTE / 3G / GPRS    Bluetooth    GPS



OPTION

 Extended temperature range

-25 ~ 65°C

**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, 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

POWER FEEDERS



**MDR-40-24**

40.8W Single Output Industrial Power Supply, DIN-rail mounting, 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 to M-Bus interface



**mBus 400**

The mBus 400 is a transparent converter from RS-232 to M-Bus interface. You can connect 4 RS-232 signal lines - RxD, TxD, CTS, RTS.

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**

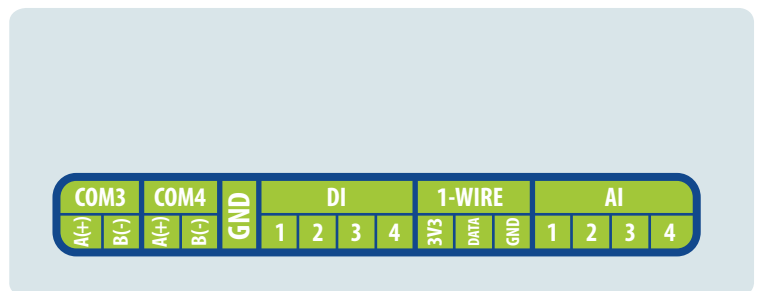
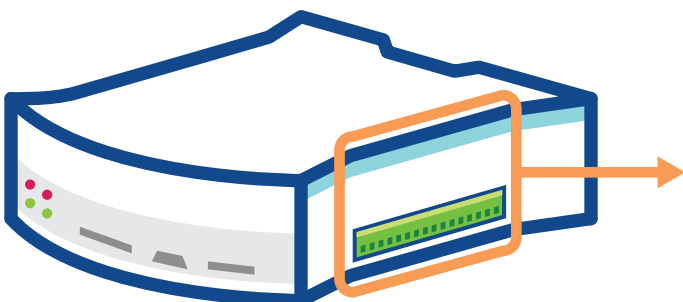
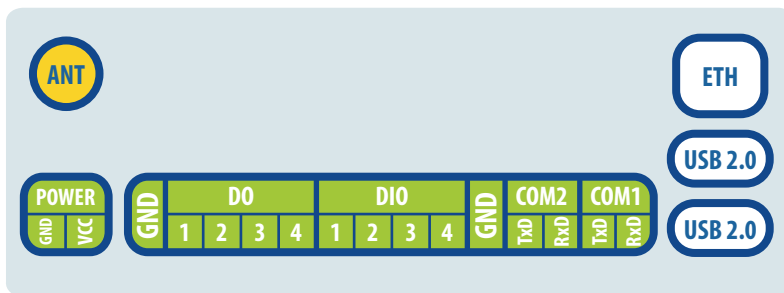
Digital inputs/outputs expansion module with MODBUS RTU support



**NPEIO-4RO**

Relay outputs expansion module with MODBUS RTU support

PINOUT



ModBerry 9500M3

## SYSTEM

CPU	Cortex-A53 @ 4x1.2GHz
RAM	1 GB LPDDR2 SDRAM
Flash Memory	4 / 8 / 16 / 32 GB eMMC
Operating system	Linux 4.0+
Real Time Clock	RTC, 240 byte SRAM, Watch Dog Timer

## ETHERNET INTERFACE

1x Ethernet 10/100 Mbps (RJ45 connector)

## SERIAL PORTS

RS-232 / RS-485 ports 2x RS-232 (3 pins) / 2x RS-485 (2 pins)

## USB PORTS

2x 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	4x AI - range (0..10V) DC (18-bit resolution) <b>(optional)</b>
Configurable I/Os	4x DI/DO (0..30V DC), max. power efficiency: 500 mA
1-Wire	1x 1-Wire

## POWER SUPPLY

9 ~ 30 V DC, w/o modem: 20W, with modem: 40W

## MECHANICAL PARAMETERS

Dimensions	45 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: -25 ~ 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)  
 LTE/3G modem, GPS module, ZigBee, Bluetooth, **ExCard** (RS-232/485, PCIe, DIO, 1-Wire)

## CONNECTORS AND PHYSICAL INTERFACES

1x RJ45 (Ethernet)  
 1x miniHDMI **(optional)**  
 2x monostable switch button  
 1x16 pin screw terminal  
 1x14 pin screw terminal  
 1x2 pin power supply screw terminal  
 2x USB 2.0 type A  
 1x miniSIM card slot

## MANUFACTURER

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

\* We cannot guarantee a cold start of the cooled system at temperatures below -30 °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.