

# ModBerryM1000<sup>r</sup> series

Programmable automation controller (PAC)



ModBerry M1000 is the newest series of industrial computers which you can easily adapt to your needs by choosing from the available options.

Energy-efficient **Intel Atom x5 Z8350 64-bit 1.92GHz** processor

Possibility to select a suitable amount of resources: **1/2/4 GB RAM** and **16/32/64 GB eMMC** depending on project's requirements

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

Economic **1-Wire bus, Gigabit Ethernet** and **USB 2.0/3.0**

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



ModBerry M1000

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

Fully configurable IoT platform - you can setup hardware options of your device; compatible with X86 systems, such as: Microsoft Windows 10, Linux (ubinux, Ubuntu, Yocto), Android Marshmallow

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:**  
1x RS-232/485

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

**Communication interfaces:**  
Ethernet 10/100/1000 Mbps, 1-Wire, 4x USB 2.0, 1x USB 3.0 OTG

**Audio/Video:**  
HDMI

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

## 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

Available upgrade to innovative iMod software platform

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

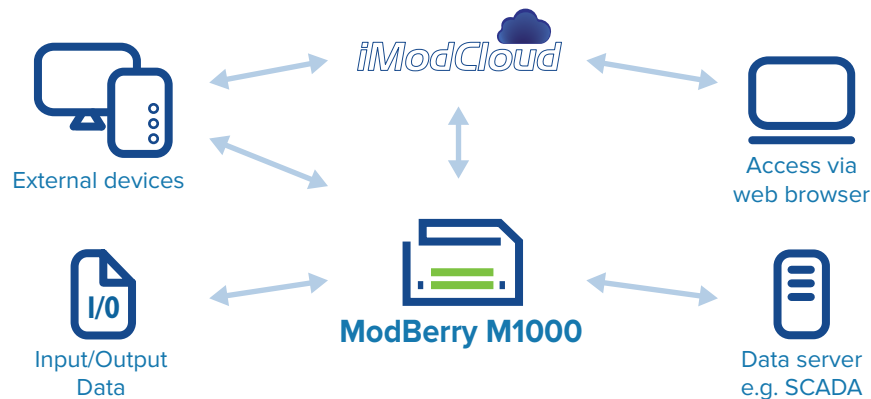
Full technical support through a dedicated portal, project cooperation via TECHBASE Solution Partner

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 M1000 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 ~ 80°C

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

Modem for data LTE/3G/GPRS data transmission and SMS support. ModBerry M1000 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

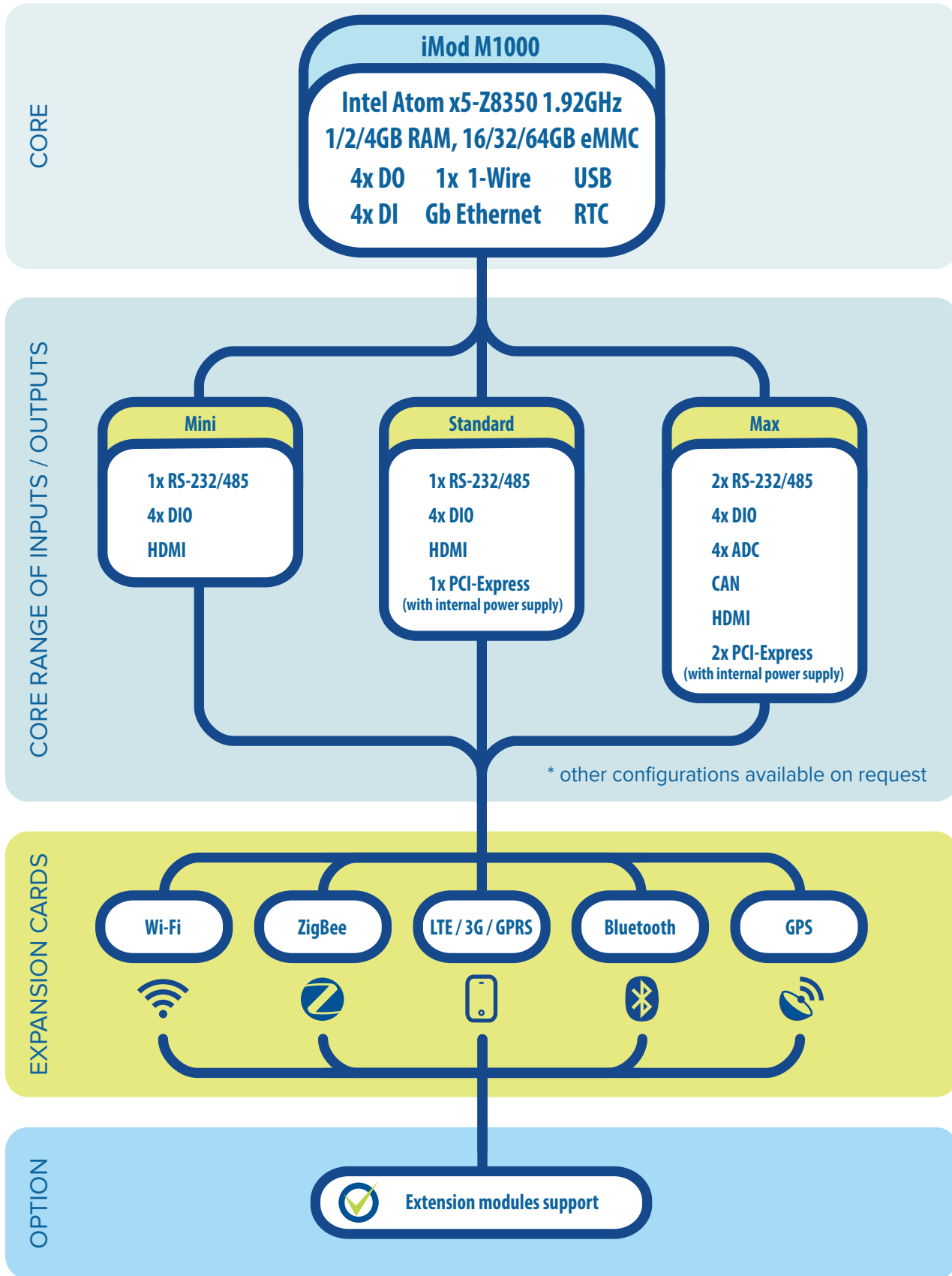
**PYTHON/RUBY/JAVA/PHP** - packs allowing creating, development and start-up of applications in many programming languages

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

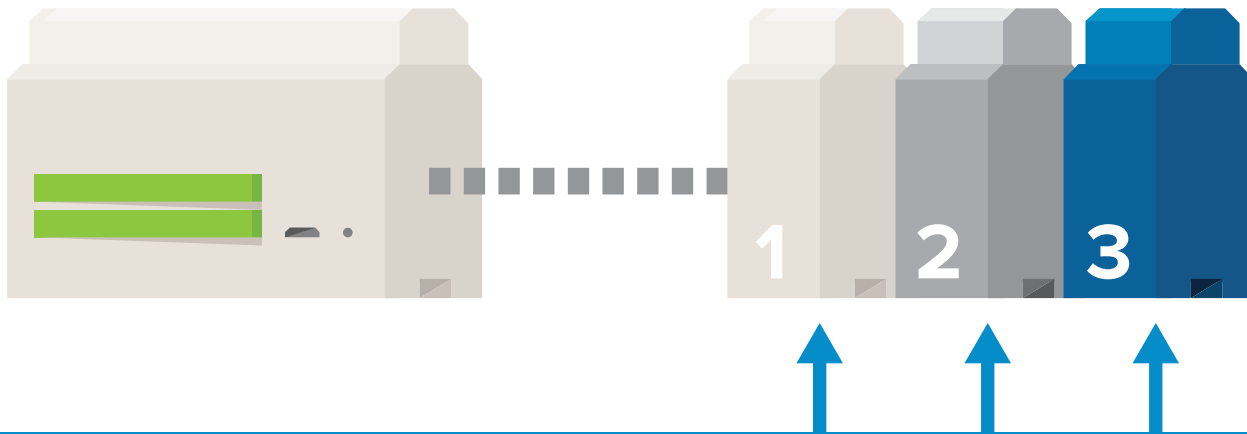
**Open VPN** - enables creating a connection, allowing communication between devices located in different networks, providing very high level of security

**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 M1000** 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

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

## SYSTEM

CPU	Intel® Atom™ x5 Z8350 Processor 64 bit - up to 1.92GHz
RAM	1/2/4 GB
eMMC	16/32/64 GB
Operating system	Microsoft Windows 10, Linux (ubinux, Ubuntu, Yocto), Android Marshmallow
RTC	RTC, 240 byte SRAM, Watch Dog Timer

## ETHERNET INTERFACE

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

## SERIAL PORTS

1x RS-232/485

## USB PORTS

4x USB 2.0, 1x USB 3.0

## INPUTS / OUTPUTS

Digital inputs (DI)	4x DI (0..30V DC)
Digital outputs (DO)	4x DO (0..30V), max. power efficiency: 500 mA
Configurable I/Os	4x DI/DO (0..30V DC), max. power efficiency: 500 mA
1-Wire	1x 1-Wire
HDMI	1x HDMI 1.4b

## POWER SUPPLY

**Terminal:** 9~30VDC min. 20W, **DC Barrel Connector:** 5VDC @ 4A

## MECHANICAL PARAMETERS

Dimensions	91 x 106 x 61 mm
Weight	300g
Casing	ABS, DIN rail mounting

## OPERATING CONDITIONS

0 ~ 60°C, humidity 10 ~ 80% RH (non-condensing)

## AVAILABLE EXPANSION CARDS

Wi-Fi (IEEE 802.11 b/g/n, speed up to 150 Mbps, 64/128-bit WEP, WPA, WPA2)  
 LTE/3G modem, GPS module, ZigBee, Bluetooth, **EXCard modules** (page 4)

## CONNECTORS AND PHYSICAL INTERFACES

- 1x screw terminal
- 1x screw terminal for power supply
- 1x RJ45 (Ethernet)
- 1x HDMI
- 4x USB 2.0 type A
- 1x USB 3.0 OTG
- 1x SIM card slot

## MANUFACTURER

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

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

INTERNAL EXPANSION MODULES

<b>ExCard 4RS</b>	2x or 4x RS232/485 serial port
<b>ExCard ETH</b>	1x or 2x Ethernet port
<b>ExCard EXP</b>	1x PCI-Express slot
<b>ExCard AI</b>	8x analog input AI or 4x analog input AI dual mode
<b>ExCard AO</b>	8/4x analog output
<b>ExCard 4R</b>	4x relay
<b>ExCard DIO</b>	12x configurable digital input/output DIO
<b>ExCard AK</b>	Accelerometer
<b>mBus10</b>	M-Bus to RS232 or RS485 interface converter (up to 10 SLAVE devices)
<b>mBus60</b>	M-Bus to RS232 or RS485 interface converter (up to 60 SLAVE devices)
<b>mBus400</b>	M-Bus to RS232 or RS485 interface converter (up to 400 SLAVE devices)