ModBerry M1000 series
Programmable automation controller (PAC)

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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 (ubilinux, Ubuntu, Yocto), Android Mashmallow

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:
2x Ethernet 10/100 + 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

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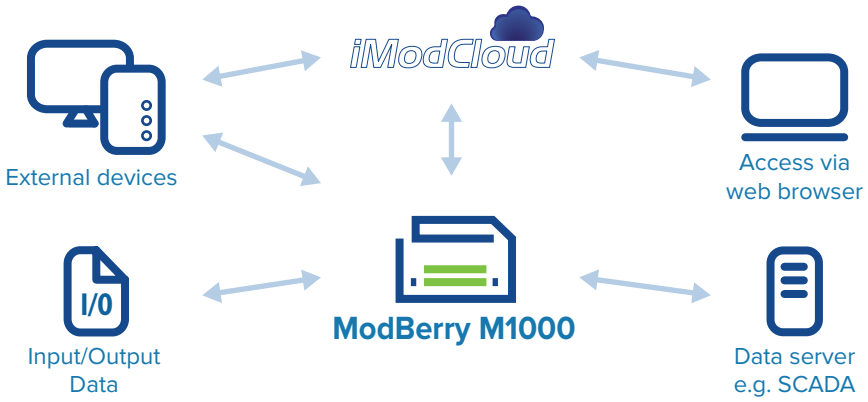
Typical method of use (3 functions: C-L-V)

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 i 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**

iModCloud is a Software as a Service (SasS) 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

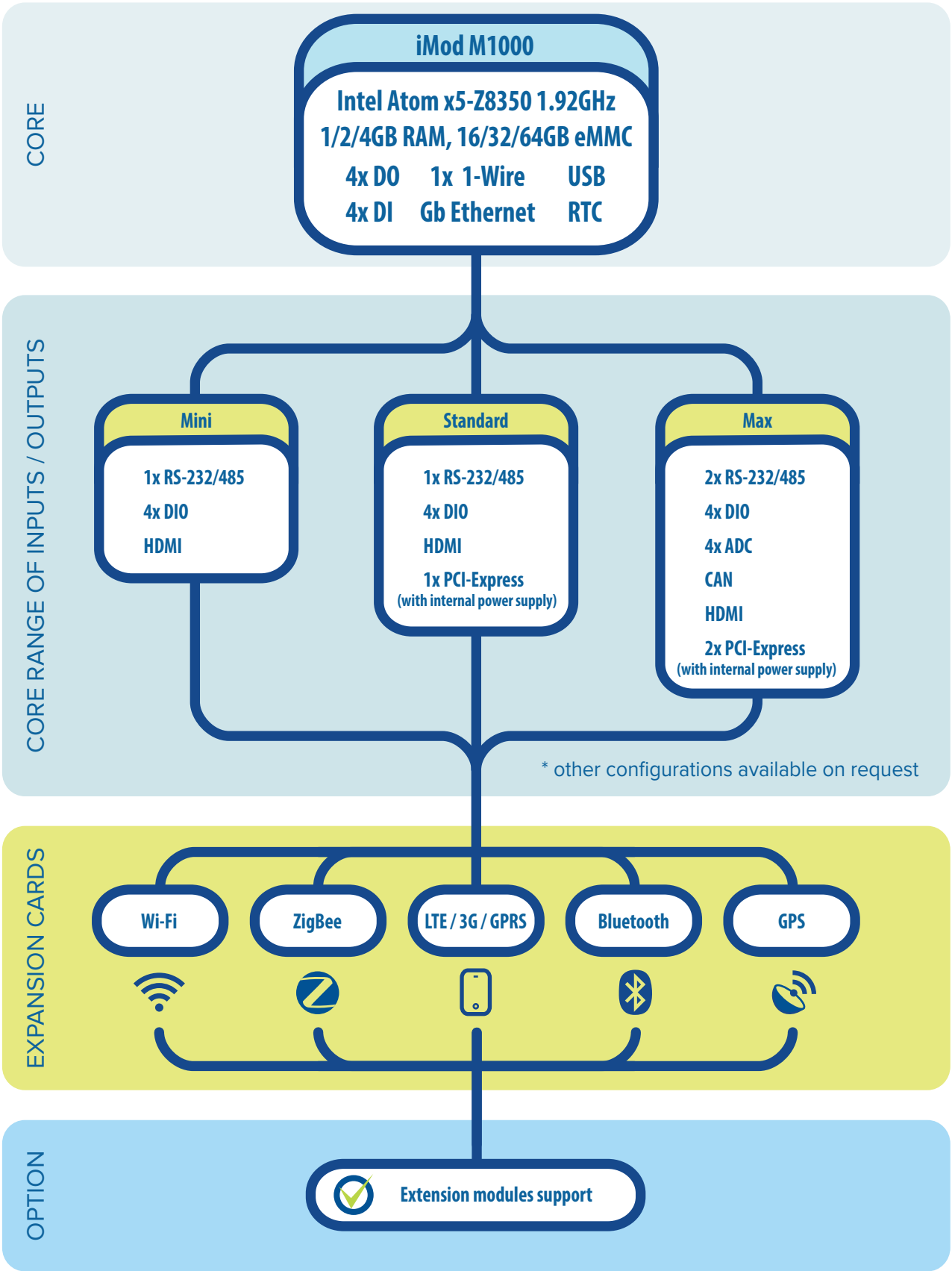
PYTHON/RUBY/JAVA/PHP - packs allowing creating, develomepent and start-up of applications in many programming languages

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 maintainging high level of security

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


CORE
iMod M1000
Intel Atom x5-Z8350 1.92GHz
1/2/4GB RAM, 16/32/64GB eMMC
4x DO
4x DI
1x 1-Wire
Gb Ethernet
USB
RTC
CORE RANGE OF INPUTS / OUTPUTS
Mini
1x RS-232/485
4x DIO
HDMI
Standard
1x RS-232/485
4x DIO
HDMI
1x PCI-Express
(with internal power supply)
Max
2x RS-232/485
4x DIO
4x ADC
CAN
HDMI
2x PCI-Express
(with internal power supply)
* other configurations available on request
EXPANSION CARDS
Wi-Fi
ZigBee
LTE / 3G / GPRS
Bluetooth
GPS
OPTION
Extension modules support

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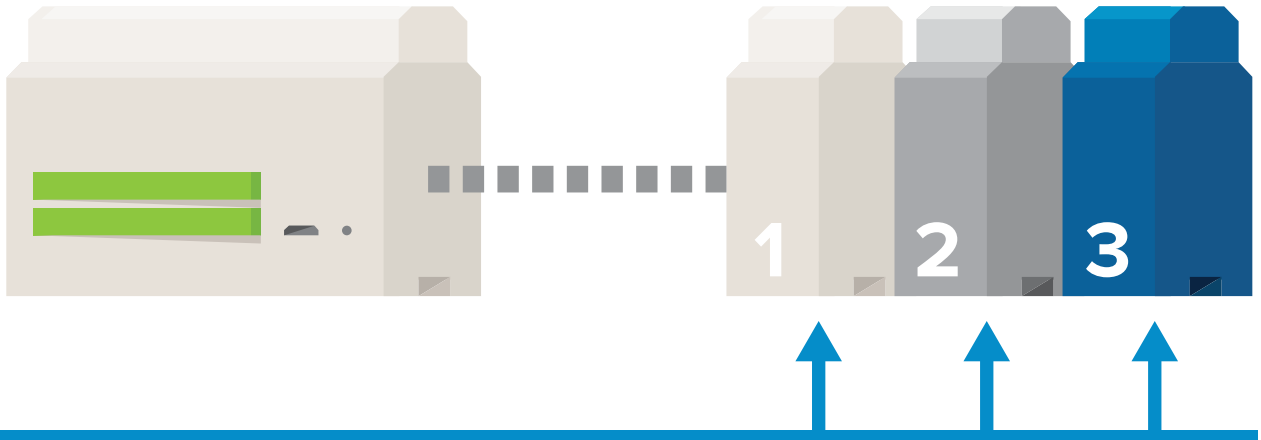
The **ModBerry M1000** device allows use of up to 3 expansion modules, increasing its capabilities with additional I/Os, providing support for additional modems and wireless communication modules, and adding new features such as accelerometer and opto-isolation.



INTERNAL EXTENSION MODULES

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

INTERNAL MODEMS

Wi-Fi	Wi-Fi Standard 802.11 b/g/n
Bluetooth	Bluetooth 4.0
ZigBee	ZigBee modem
GPS	GPS receiver
GPRS/GPS	GPRS/GPS modem
GPRS/Bluetooth	GPRS/Bluetooth 3.0 modem
3G/GPS	3G/GPS modem
LTE/3G/GPRS	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.

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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 (ubilinux, Ubuntu, Yocto), Android Mashmallow
RTC	RTC, 240 byte SRAM, Wath Dog Timer
ETHERNET INTERFACE	
	1x Ethernet 10/100 Mbps (RJ45 connector)
	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 Barel Conector:** 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
	2x 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., Gdynia, Poland

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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

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mBus400	M-Bus to RS232 or RS485 interface converter (up to 400 SLAVE devices)