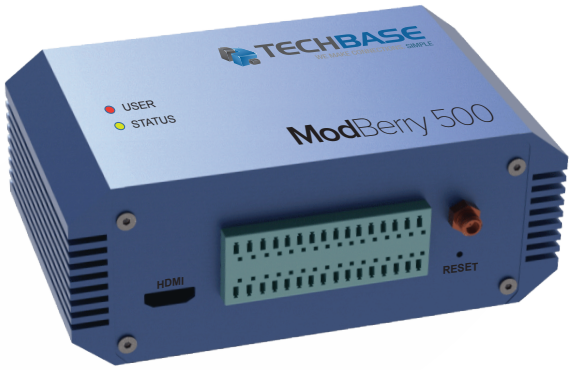
TECHBASE
WE MAKE CONNECTIONS. SIMPLE

Powered by Raspberry Pi

ModBerry 500 - Industrial Computer

ModBerry 500 is a series of industrial computers which you can easily adapt to your needs by choosing from the available options.

- **Raspberry Pi** compute module
- **512 MB RAM** and **4GB NAND FLASH memory**
- Rich set of I/O interfaces: including **digital and analog inputs/outputs, RS-232/RS-485 serial ports**
- Economic **1-Wire bus**, typically used for reading temperature and humidity sensors
- Expandable hardware resources: **LTE/3G/GPRS, WiFi, ZigBee**



ModBerry 500

Basic information

- 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/GPRS modem
- Standard protocol support (e.g. MODBUS, SNMP), 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 I/O:**
  4x Digital Input, 4x Digital Output
- **Configurable Digital I/O:**
  4x Digital Input/Output
- **Analog inputs:**
  4x Analog Input
- **Communication interfaces:** Ethernet, 1-Wire, CAN, USB
- **Audio/Video:** HDMI, Audio Output
- **Expanshion cards:**
  Wi-Fi, ZigBee, LTE/3G/GPRS, Bluetooth, GPS
- **Other:** Extended temperature range

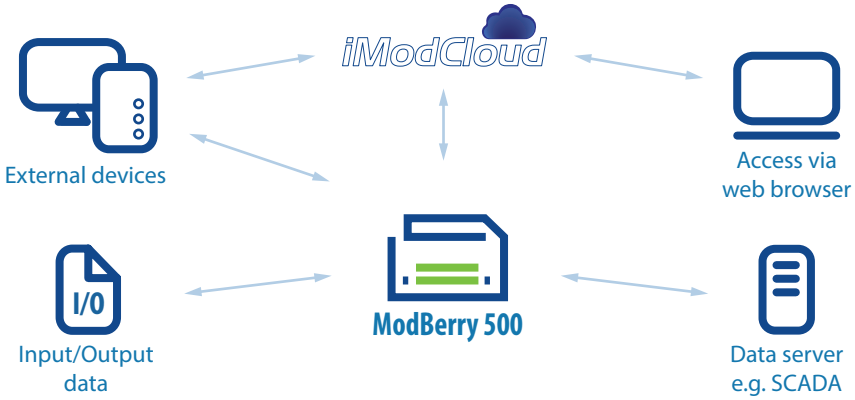
Software Properties

- New firmware based on Raspberry Pi Linux guarantees stability and security of operation
- Compatible with Raspberry Pi software
- Expansion modules to increase the amount of available interfaces (see accessories section)
- Ready tools and pre-compiled packs, 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

Applications

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)



You can configure the device, so it performs the 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

Adapted 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 or aluminum, 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

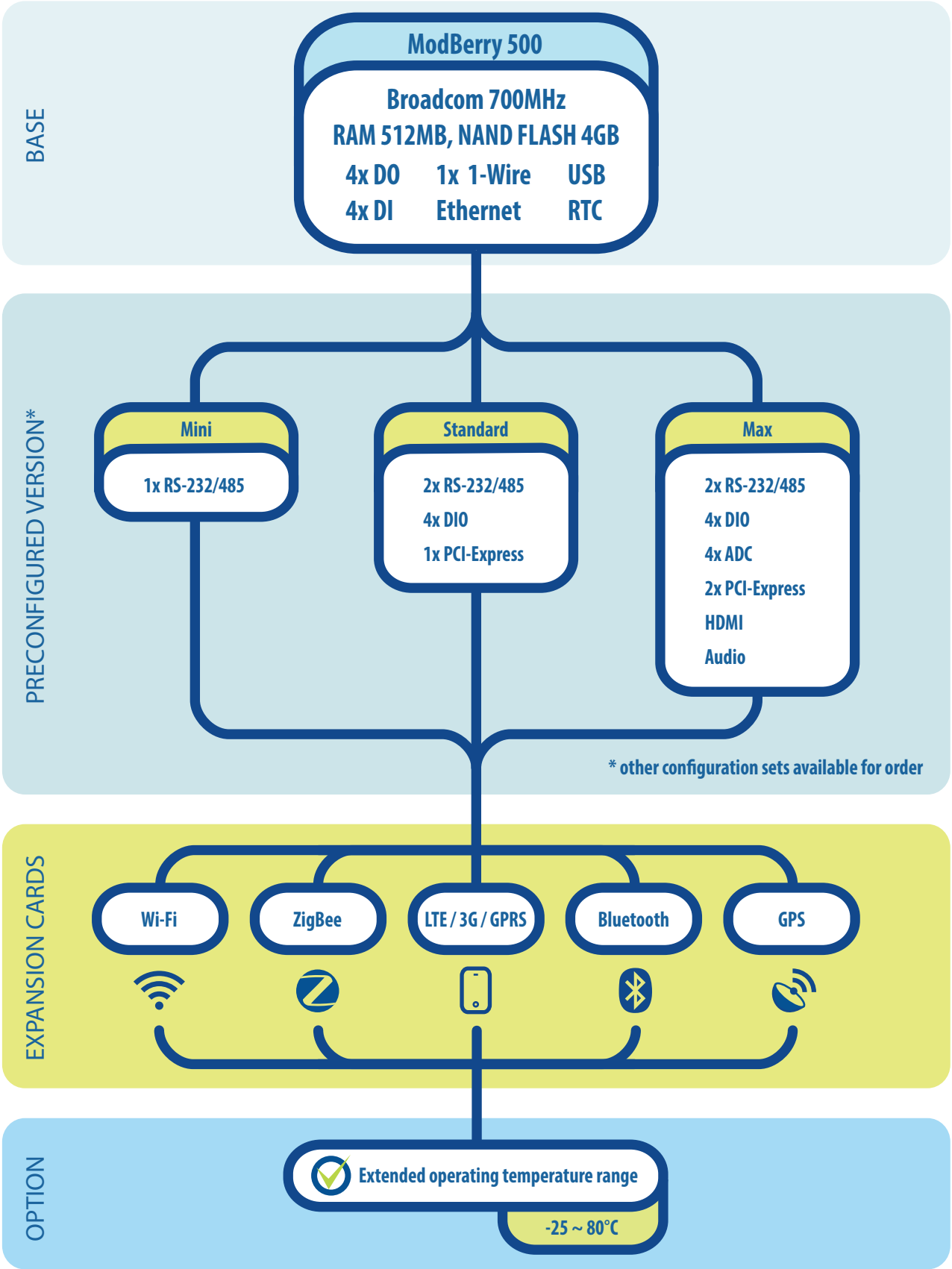
Built-in LTE/3G/GPRS/EDGE*

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

* depending on product version

Configuration Scheme



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Dedicated ready-to-use device software

COMING SOON COMING SOON COMING SOON

- **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.

iModCloud

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 NPE, 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

NXDynamics - a platform for fast and easy (drag and drop system) creation of WWW visualizations and a web panel for NPE management through an internet browser

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

Accessories

POWER FEEDERS

SDK-0302-12VDC-R
AC/DC power feeder, input 100-240V AC, output 12V DC 1000mA, cable endings in tube terminals

DN-20-24
DIN bus power feeder, output 24V DC 24W, input 88..264 V AC or 124..370 V DC

ANTENNAS

ANT-GSM-1M
GSM antenna with frequency 824-960MHz/1710-1910MHZ/1920-2170MHz

ADA-0086-L
Screw-in angular antenna, SMA, 900/1800 MHz

1-WIRE SENSORS

1Wire-Therm-Stainless
Digital temperature sensor in steel housing

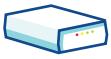
1Wire-Therm-ABS
Digital temperature sensor closed in ABS plastic housing

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.

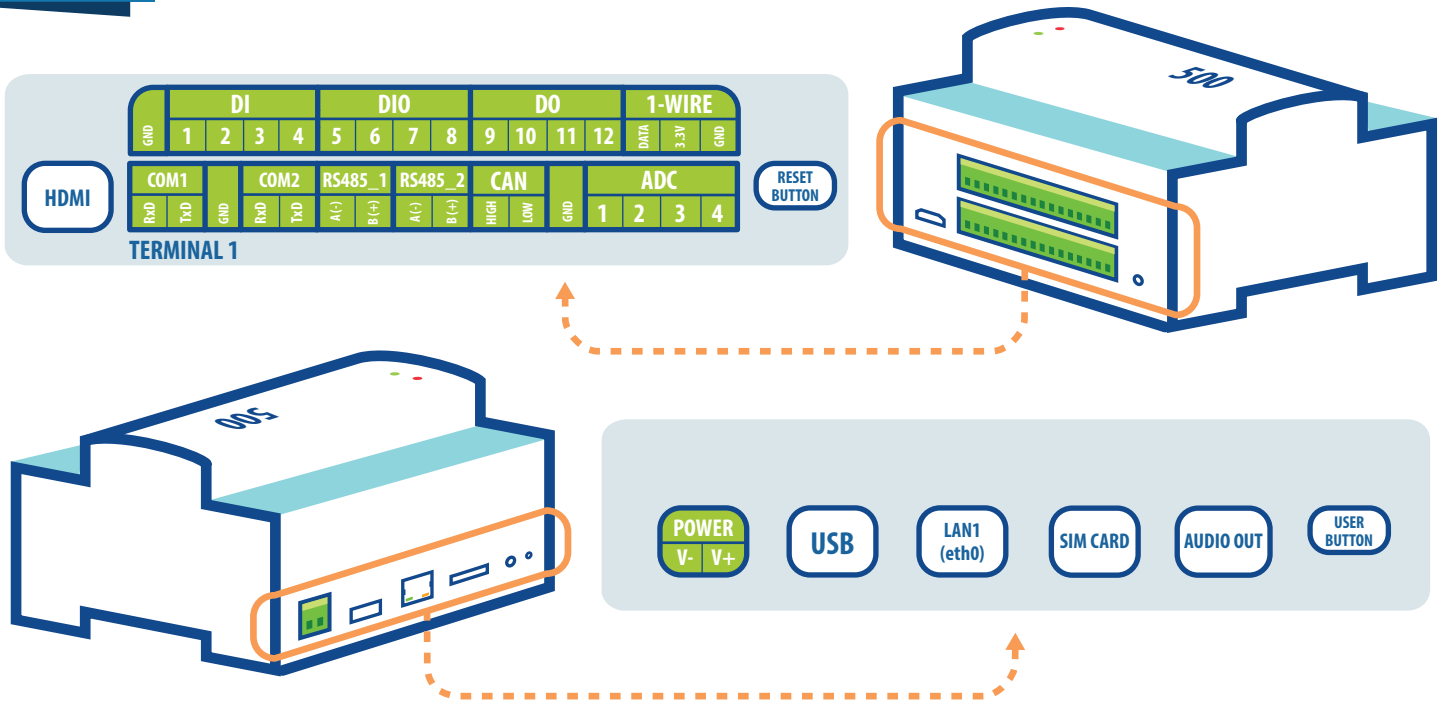
ZIGBEE SENSORS/MODULES



ZS-10, ZS-20
Multi-channel ZigBee Sensor with Battery Power Supply

ZM-10, ZM-20
ZigBee Relay I/O Module

Pinout



Technical specification

Processor module	Raspberry Pi Compute Module SO-DIMM
CPU	Broadcom 700MHz
RAM	512MB
Flash Memory	4096MB (shared with RAM)
Operating system	Linux Kernel 3.6, supported by Raspberry Pi
Real Time Clock	RTC, 240 byte SRAM, Wath 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	
	1x external USB 2.0 (host), 1x internal USB 2.0
INPUTS / OUTPUTS	
Digital inputs (DI)	4x DI (0..5V DC)
Digital outputs (DO)	4x DO (0..30V), max. power efficiency: 500 mA
Configurable I/Os	4x DI/DO, max. power efficiency: 500 mA
Analog inputs	4x AI - range 0..10V DC (18bit resolution)
1-Wire	1x 1-Wire
CAN	1x CAN
POWER SUPPLY	
	9 ~ 24 V DC, 1000 mA
MECHANICAL PARAMETERS	
Dimensions	91 x 106 x 61 mm
Weight	300g
Casing	ABS or Aluminum, DIN bus instalation
OPERATING AND STORAGE CONDITIONS	
	0 ~ 70°C, humidity: 5 ~ 95% RH (no condensation)
	Extended operating temperature: -25 ~ 80°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/GPRS modem, GPS module
	Bluetooth, ZigBee
CONNECTORS AND PHYSICAL INTERFACES	
	1x RJ45 (Ethernet)
	1x HDMI
	2x monostable switch button
	1x32 pin screw terminal
	1x USB 2.0 type A
	1x 2 pin power
	1x SIM CARD slot
PRODUCER	
	TECHBASE Group Sp. z o.o., Pana Tadeusza 14, 80-123 Gdańsk, Poland

*some of the expansion cards can limit operating temperature range