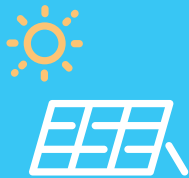


# Upgrade your installations with newest Raspberry Pi CM5

Our device **ModBerry 500 CM5** is now available with latest, fourth gen. **Raspberry Pi Compute Module 5**. Upgraded **ModBerry 500** device offers higher performance, thanks to quad-core **Cortex A76** processor with higher computing frequency, up to **16GB LPDDR4x-4267 SDRAM**, up to **64GB eMMC Flash** and optional features, including Gigabit Ethernet, PCI-Express 2.0 for M.2 SSD and wireless communication, USB 3.0, Wi-Fi 2.4/5GHz / BT 5.0. **ModBerry 500** maintains low power consumption and optimal price of this solution.



TECHBASE  
**MODBERRY**  
**500CM5**



**NEW QUAD-CORE  
PROCESSOR 2.4GHZ**

**USB 3.0 SUPPORT**

**AI, 5G AND NVME SSD  
SUPPORT**

ModBerry 500CM5 is the newest series of industrial computers which you can easily adapt to your needs by choosing from the available options.

High-performance quad-core **Cortex A76 2.4GHz** processor

**2/4/8/16GB RAM** and **up to 64GB** flash memory

Rich set of I/O interfaces incl. **Gigabit Ethernet, digital and analog inputs/outputs, RS-232/RS-485 serial ports, 1-Wire, USB 3.0, HDMI**

Optional wireless communication: **built-in WiFi 2.4/5GHz, Bluetooth 5.0, 5G, 4G/LTE, NarrowBand-IoT, LoRa, Wireless M-Bus, ZigBee, GPS & more**

Expandable storage with **NVMe SSD** via **M.2** or optional miniPCIe slot. **PCIe 2.0** also available for **5G** modems



ModBerry 500<sup>CM5</sup>

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

Designed for the needs of automation, telecommunications, remote supervision, and monitoring and edge-computing with AI on-board

Full range of communications interfaces, including 4G/LTE and optional 5G modem

Standard protocol support (e.g. MQTT, 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

**Communication interfaces:** Gigabit Ethernet, USB 3.0 (optional), 1-Wire (optional), CAN (optional), PCIe 2.0 via miniPCIe or M.2

**Audio/Video:** HDMI 2.0 (optional)

**Expansion cards:**  
built-in WiFi 2.4/5GHz, Bluetooth 5.0, 5G, 4G/LTE, NB-IoT, LoRa, Wireless M-Bus, ZigBee, GPS, ExCard modules

## Software properties

New firmware based on Linux Kernel 5.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

Innovative iMod software platform

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

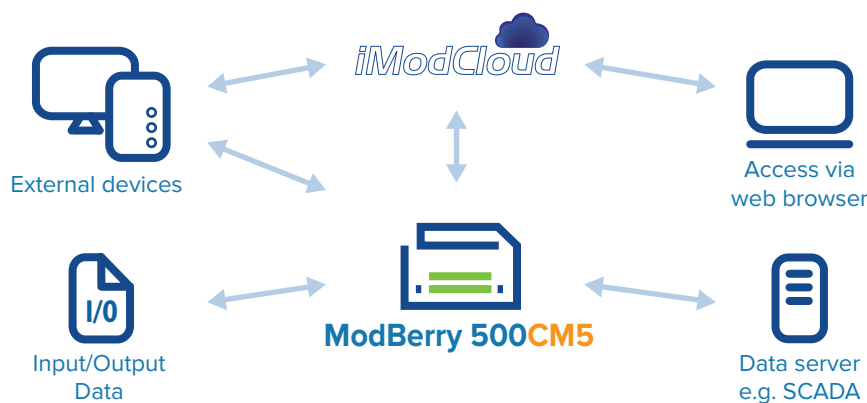
Full technical support through a dedicated portal, project cooperation via TECHBASE Solution Partner

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 500 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
- 3 options for processor cooling (passive, active and advanced)
- 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

**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

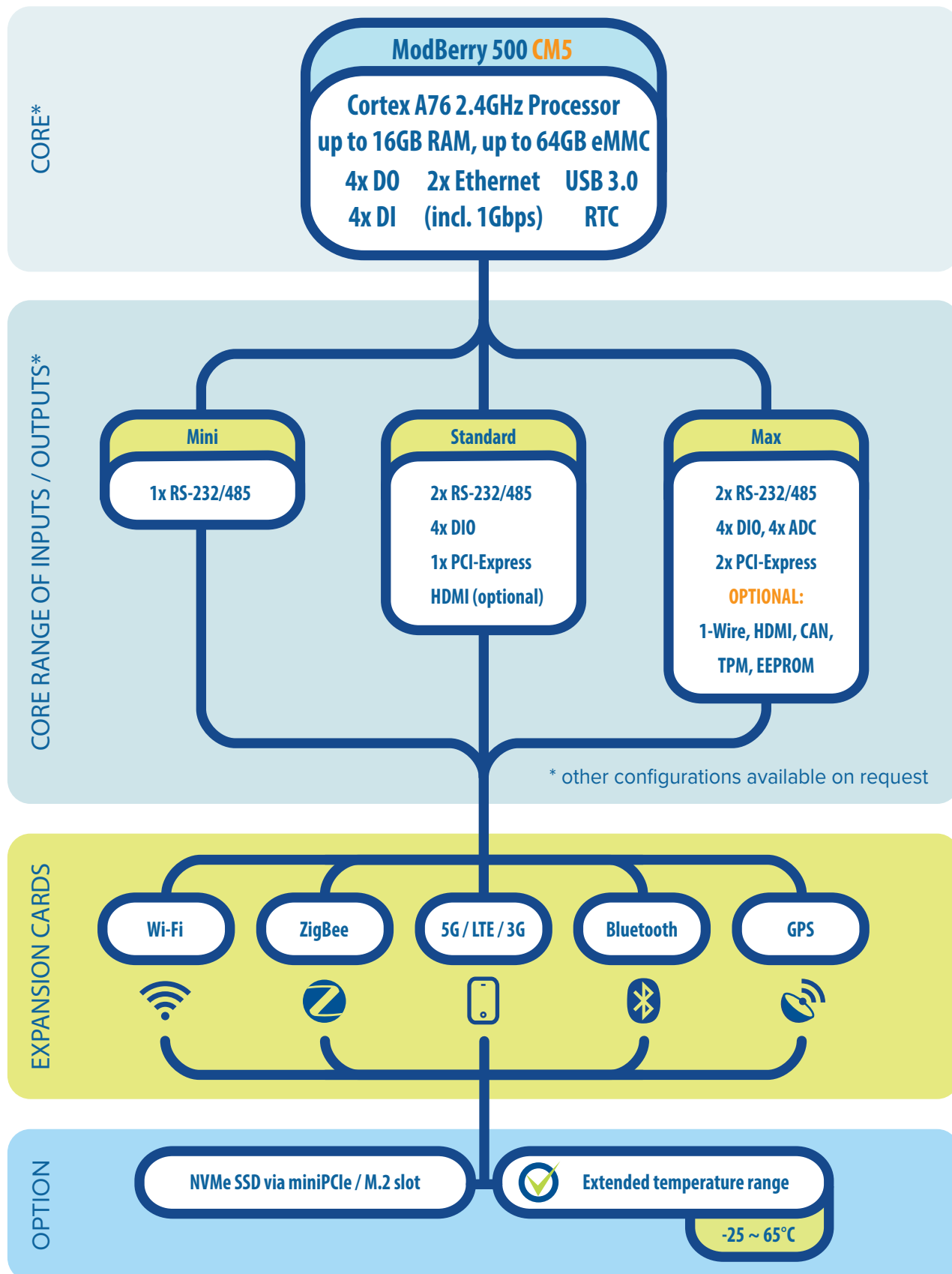
**PYTHON/RUBY/JAVA/PHP** - packs allowing creating, development and start-up of applications in many programming languages

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

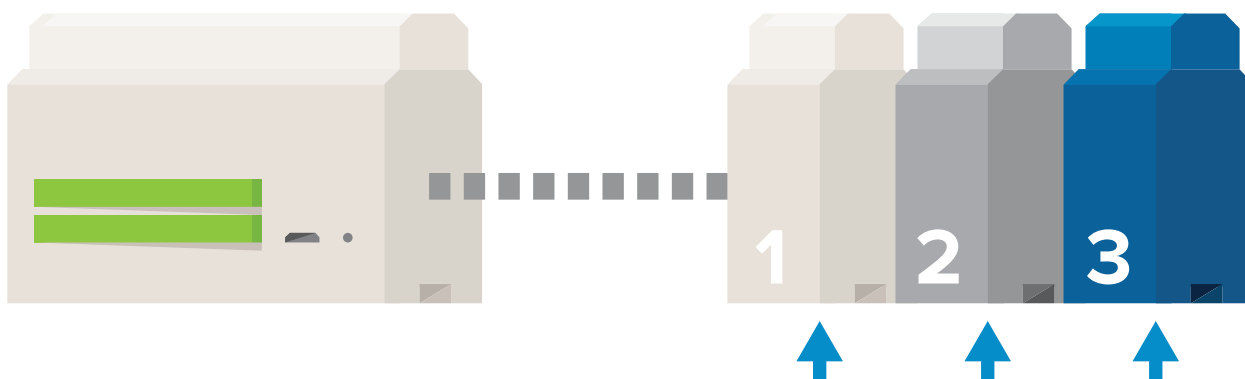
**Open VPN** - enables creating a connection, allowing communication between devices located in different networks, providing very high level of security

**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 500 CM5** 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>	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>mBus200/400</b>	M-Bus interface to RS232 or RS485 converter ( <b>up to 200/400 SLAVE devices</b> )
<b>Coral from Google</b>	Artificial Intelligence module with Coral Edge TPU on-board

## INTERNAL MODEMS

<b>Wi-Fi</b>	Wi-Fi Standard 802.11 b/g/n/ac
<b>Bluetooth</b>	Bluetooth 5.0
<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>5G</b>	5G modem
<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	BASE	MAX	MODBERRY 500 CM4
CPU	Cortex-A76 @ 4x2.4GHz, TDP: 7W	Boost: 4x 2GHz 	4x 1.5GHz
RAM	2 / 4 / 8 / 16 GB LPDDR4x-4267 SDRAM	16 GB LPDDR4 	2 GB DDR2
Flash Memory	4 / 8 / 16 / 32 / 64 GB eMMC	64 GB eMMC 	32 GB eMMC
Storage	NVMe SSD via PCIe 2.0 (miniPCIe or <b>optional</b> M.2 slot)	NVMe SSD M.2 	Flash drive
Operating system	Linux 5.X	Linux 5.X	Linux 5.X
Real Time Clock	RTC, 240B SRAM, Watch Dog Timer	2x RTC w/battery	2x RTC w/battery
Other	TPM 2.0 ( <b>optional</b> ), EEPROM ( <b>optional</b> )	TPM 2.0, EEPROM	TPM 2.0, EEPROM
ETHERNET INTERFACE			
	<b>1x 1 Gbps</b> (RJ45 connector)	2x 1 Gbps 	1x 1 Gbps
	1x 10/100 Mbps (RJ45 connector)	6x 10/100 Mbps	7x 10/100 Mbps
SERIAL PORTS			
RS-232 / RS-485 ports	2x RS-232 (3 pins) / 2x RS-485 (2 pins),	14x RS-232/485	14x RS-232/485
USB PORTS			
	1x external USB 2.0 (host) / 1x external USB 3.0 ( <b>optional</b> )	4x USB 3.2 Gen 1 	1x USB 2.0
INPUTS / OUTPUTS			
Digital inputs (DI)	4x DI (0..30V DC) ( <b>configurable pull up/down, optional</b> )	40x DIO	40x DIO
Digital outputs (DO)	4x DO (0..30V), max. power efficiency: 500 mA	40x DIO	40x DIO
Analog inputs/Outputs	4x AI - range (0..10V) DC (18-bit resolution)	28x AI or AO	28x AI or AO
Configurable I/Os	4x DI/DO (0..30V DC), max. power efficiency: 500 mA	40xDIO	40xDIO
Relay Outputs (RO)	( <b>optional</b> )	12x RO	12x RO
Other	1x 1-Wire ( <b>optional</b> ), 1x CAN ( <b>optional</b> )	1x 1-Wire, 1x CAN	1x 1-Wire, 1x CAN
POWER SUPPLY			
	12 ~ 30 V DC, recommended power supply: 20W, with modem: 40W Typical power consumption: 7 ~ 25W (depending on configuration)	12 ~ 30 V DC	12 ~ 30 V DC
MECHANICAL PARAMETERS			
Dimensions	106 x 91 x 61 mm	180 x 91 x 61 mm	180 x 91 x 61 mm
Weight	350-450g	400-500g	350-450g
Casing	ABS, DIN rail mounting / Alluminum ( <b>optional</b> )	ABS/AL +DIN rail	ABS/AL +DIN rail
Cooling	Passive (internal) / Active / Passive (advanced) ( <b>optional</b> )	Passive (adv.)	Passive
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)*	-25 ~ 65°C *	-25 ~ 65°C *
AVAILABLE EXPANSION CARDS			
	Built-in Wi-Fi (IEEE 802.11 b/g/n/ac), Bluetooth 5.0, 5G, 4G/LTE, 3G modem, NB-IoT, LoRa, WM-Bus, GPS module, ZigBee, Z-Wave Ready, <b>ExCard modules (page 5)</b>		
CONNECTORS AND PHYSICAL INTERFACES			
	2x RJ45 (Ethernet), 1x HDMI ( <b>optional</b> ), 2x monostable switch button, 1x mUSB OTG, 1x32 pin screw terminal, 1x USB 2.0 type A, 1x 2 pin power, 1x SIM 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.

## 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

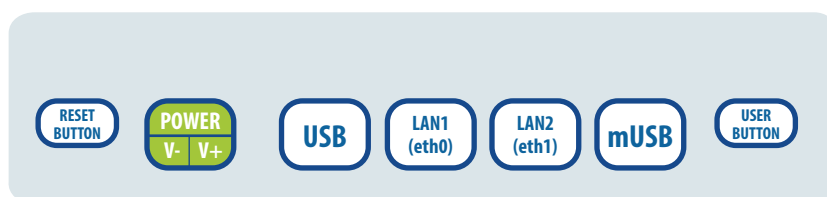
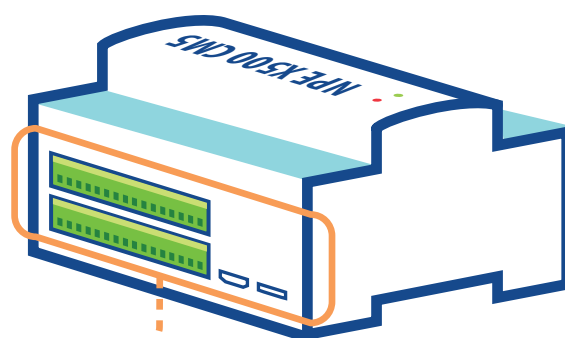
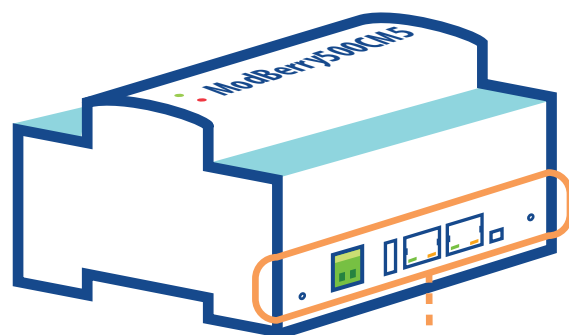
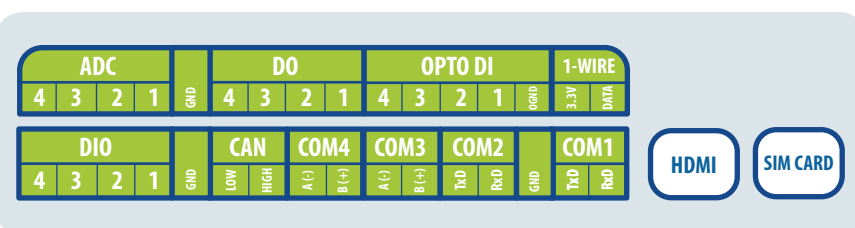
Digital inputs/outputs expansion module with MODBUS RTU support



### NPEIO-4RO

Relay outputs expansion module with MODBUS RTU support

## PINOUT







ModBerry 500CM5