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## Installation, use and maintenance manual



**BEFORE STARTING UP THE INDUSTRIAL PC OF FLXMOD CPC 04XX SERIES, CAREFULLY READ THIS MANUAL AND FOLLOW ALL INSTRUCTIONS, IN ORDER TO ENSURE MAXIMUM SAFETY**

# INDUSTRIAL PCs

## FLXMOD CPC 04XX SERIES



The technical data and the drawings in this manual might have been modified later; always refer to the latest version.

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## 1 Preface

This manual provides all necessary information for the installation, use and maintenance of FLXMOD CPC 04XX modules.

The instructions included in this manual are addressed to the following professionals:


<b>User</b>	User is a person, a company or an institution that buys the equipment and uses it for the purposes it was designed for.
<b>User/operator</b>	User or operator is a person authorized by the user to operate on the equipment.
<b>Specialized personnel</b>	It refers to all persons with specific competence, able to recognize and avoid the dangers deriving from the use of the equipment.

The present instructions must be made available to all the above individuals.





## 2 General warnings

These assembly instructions are an integral part of the equipment, and must be kept for future reference until decommissioning.

The user should be informed that the present instructions reflect the state of the art at the moment when the equipment was sold; they will remain fully acceptable despite subsequent upgrades based on new experiences.

	<p><b>DO NOT USE THE EQUIPMENT, NOR MAKE ANY INTERVENTION BEFORE INTEGRALLY READING AND UNDERSTANDING THIS MANUAL.</b></p>
<p><b>IN PARTICULAR, ADOPT ALL SAFETY PRECAUTIONS AND PRESCRIPTIONS INDICATED IN THIS MANUAL.</b></p>	
<p><b>THE EQUIPMENT CANNOT BE USED FOR PURPOSES DIFFERENT THAN THE ONES DESCRIBED IN THIS MANUAL; SMITEC S.p.A. SHALL NOT BE HELD RESPONSIBLE FOR ANY DAMAGES, INCONVENIENCES OR ACCIDENTS DUE TO THE NON-COMPLIANCE WITH THESE PRESCRIPTIONS.</b></p>	

In order to make the manual consultation easier, the following symbols have been adopted:




	<p>Indication of "PROHIBITED ACTION".</p>
	<p>The symbol "DANGER" is used when the non-respect of the prescriptions or the tampering of organs can cause serious harm to people or things.</p>
	<p>The symbol "USE OF INDIVIDUAL PROTECTIONS" means that protective gloves must be worn.</p>
	<p>Indication of "INFORMATION OF PARTICULAR RELEVANCE".</p>

The safety prescriptions aim at establishing a series of behaviors and obligations to be complied with, while performing the activities described later on in this manual.



These prescriptions constitute the prescribed method of operating the device, in a way that is safe for personnel, equipments and environment.

### 3 Safety instructions

#### 3.1 General information

	<p>Do not install or use the equipment before integrally reading and understanding this manual. In case of difficulties of interpretation, contact SMITEC technical service.</p> <p>It is absolutely forbidden to use the equipment for different purposes than the ones described in this manual. The technical data and the drawings in this manual might have been modified later; always refer to the latest version. All upgrades can be requested to SMITEC S.p.A. directly.</p>
	<p>Make sure that the personnel is qualified and adequately informed about the risks he may run and how to avoid them.</p>
	<p>FLXMOD CPC 04XX industrial PCs can be used only after the classification of the machine operating area and after checking the safety levels, which must correspond to the assembly safety levels.</p>

#### 3.2 Precautions during handling and assembly

	<p>Use adequate tools during the assembly, in order to avoid crushing or abrasions.</p>
	<p>Metal components and sharp surfaces may cause cuts and tears. In case of contact, be very careful and wear the personal protection equipment.</p>

## 4 Product description

The CPC 04XX module is an industrial PC based on Intel® 64 architecture. Housed in a very compact plastic housing, it has been designed for standard DIN rail mounting and designed to integrate seamlessly into a FLX-MOD automation system. Depending on the model, the CPC module can be combined with a HMI B1 touch display (model CPC 0401) or connected to an external monitor via a DVI-D output on a DVI-I connector (model CPC 0402). In both models, the CPC module is a complete system for man-machine interfacing.

The computing capacity of the CPC 04XX device is given by the Intel® Atom™ Quad Core processor x5-E8000 (1.04GHz) with 2GB 1600MT / s DDR3L RAM memory.

To meet the most different interfacing needs, the CPC module provides the possibility to connect also standard input / output devices, such as keyboard, mouse, USB hub, via the integrated USB 3.0 port and a proprietary display-touch screen interface panel for via an HMI output or via a DVI-D output (in both cases on a DVI-I connector to ensure compatibility).

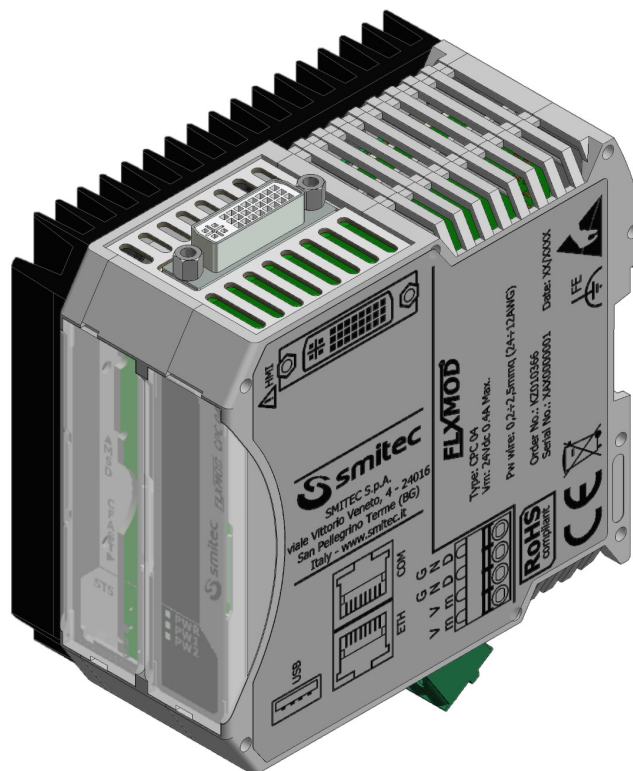
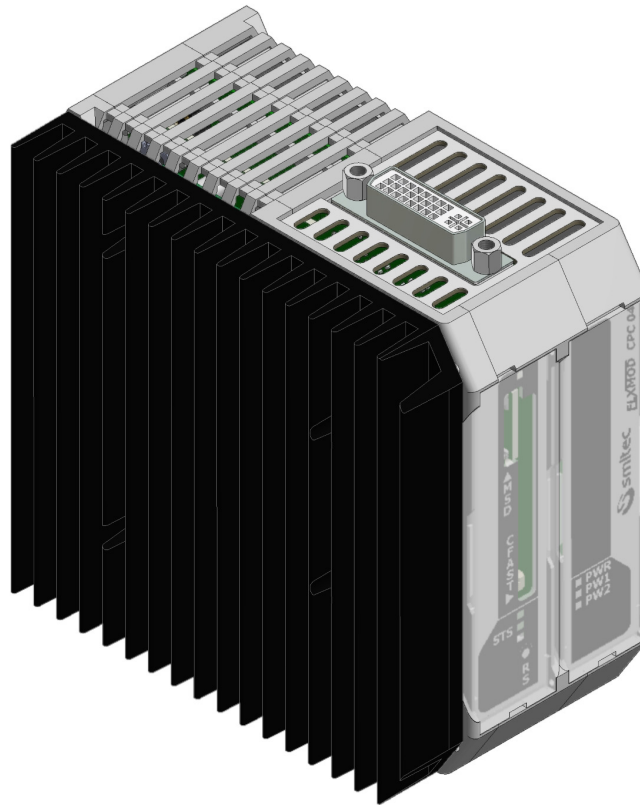
The CPC module can communicate with the outside world via a USB 3.0 port, 1 or 2 10/100/ Ethernet ports 1000Mb and an RS485 serial port (depending on the model).

It also has a socket for connecting a micro-SD memory and a socket for connecting a CFast memory, ideal for storing the operating system, programs and data as it is a high-speed flash-type solid-state memory with SATA interface, characterized by exceptional resistance to shocks and vibrations.

The position of the CFast and micro SD memories inside the CPC 04XX module is such that it can be extracted without opening it.



4.1 Pictures of module CPC 04XX



## 5 Technical data



All the technical data in this section correspond to the hardware configuration of the CPC 04XX manufactured on the date when this manual was drawn up. To improve or update this product, SMITEC S.p.A. reserves the right to modify its technical features without notice.

### 5.1 Environmental specifications

<b>Operating temperature</b>	0° ÷ +40°C when it is operating
<b>Storage temperature</b>	-20° ÷ +85°C when it is not operating
<b>Relative humidity</b>	0 ÷ 95% (without condensation)
<b>Housing</b>	Polyamide (PA66) and aluminum
<b>Protection degree</b>	IP20 according to IEC 60529
<b>Altitude (operation)</b>	Up to 2000 m above sea level (corresponding to an atmospheric pressure from 80 to 106 kPa)
<b>Altitude (storage and transportation)</b>	Up to 3000 m above sea level (corresponding to an atmospheric pressure from 70 to 106 kPa)

### 5.2 Electrical specifications

The specifications below refer to the CPC 04XX unit alone, without any peripheral unit connected.

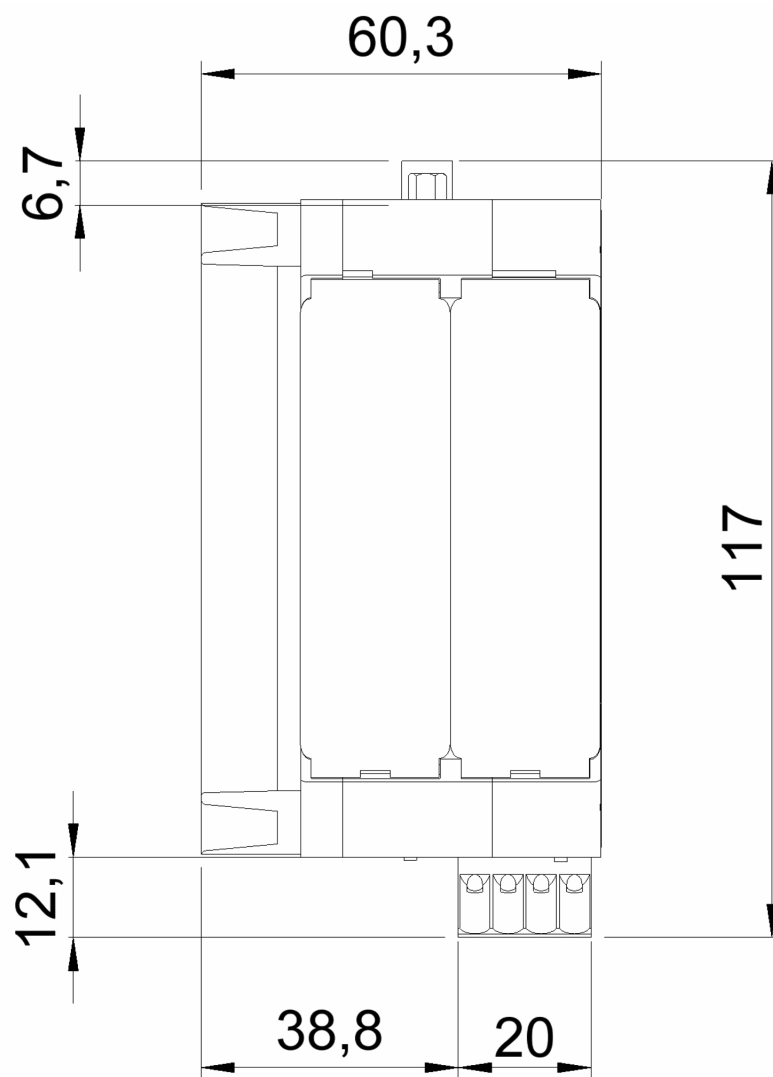
<b>Mains voltage</b>	24 VDC (- 15% ÷ +20% according to EN 61131-2)
<b>Absorbed current</b>	Max 0.50A @ 24VDC
<b>Absorbed power</b>	Max 12W
<b>Ripple</b>	Max 5% of the supply voltage according to EN 61131-2

### 5.3 Mechanical specifications

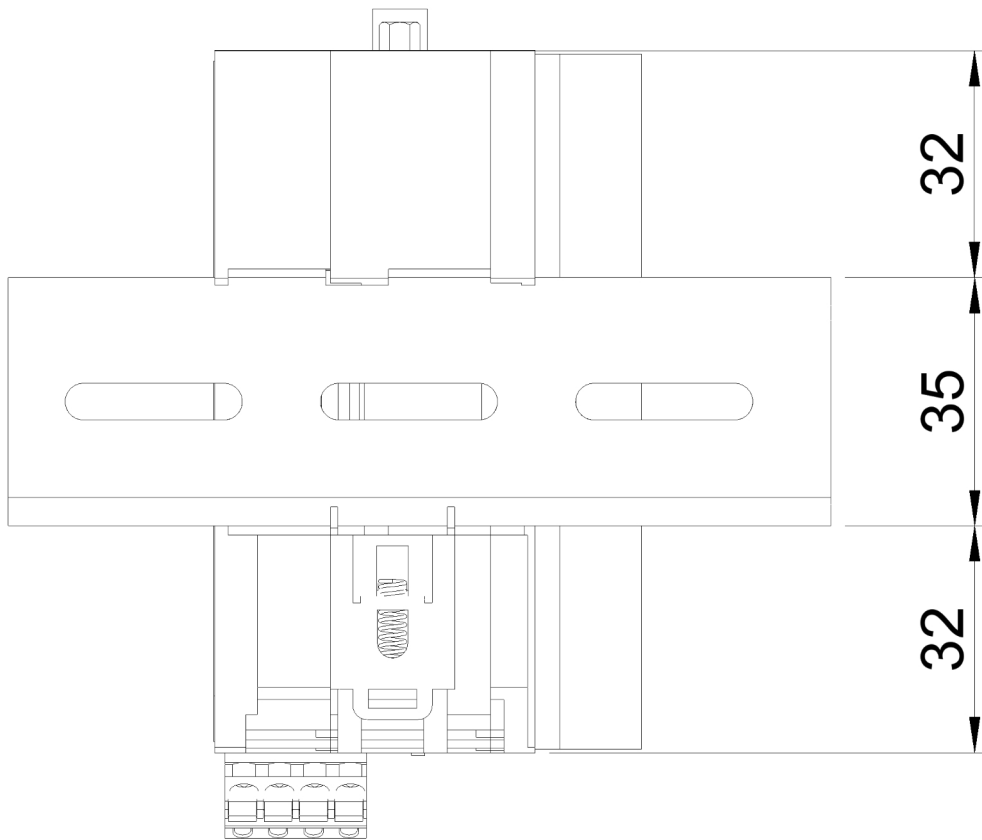
Fastening	Installed on standard DIN rail
Weight	510g

#### 5.3.1 Mechanical dimensions

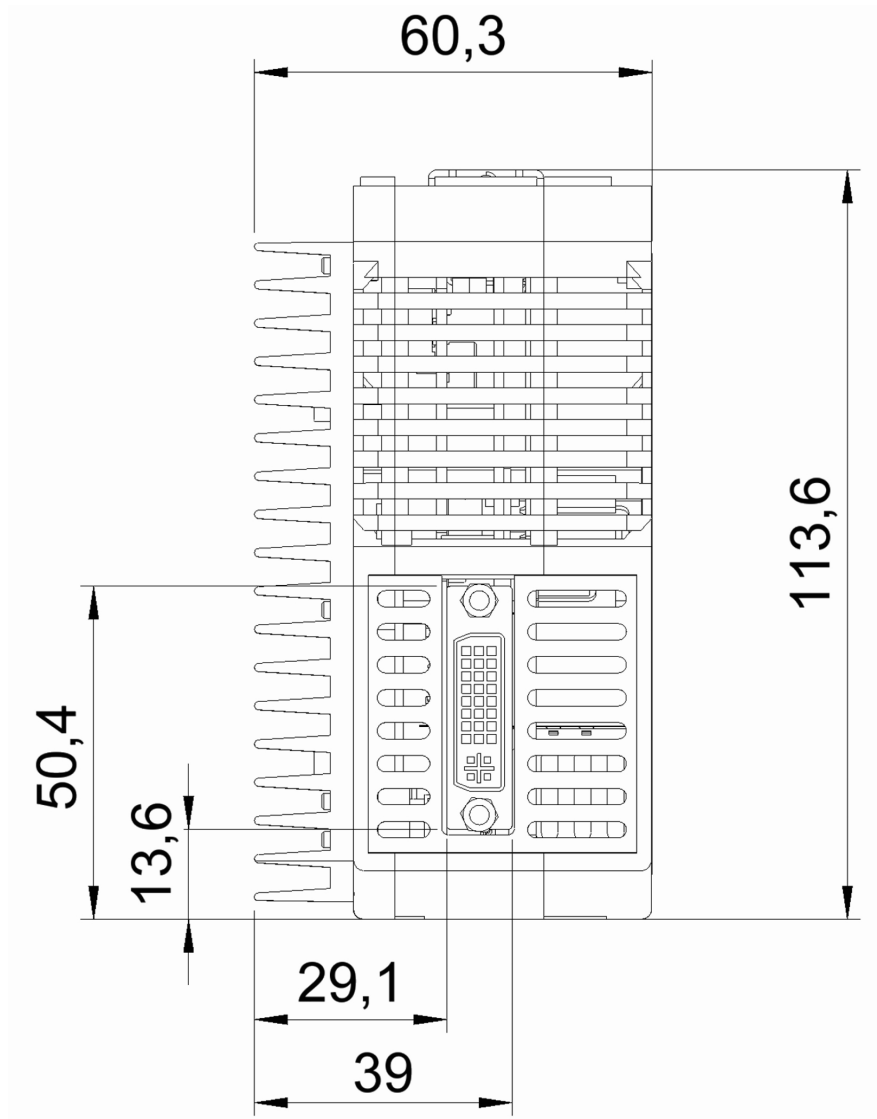
##### 5.3.1.1 Front view



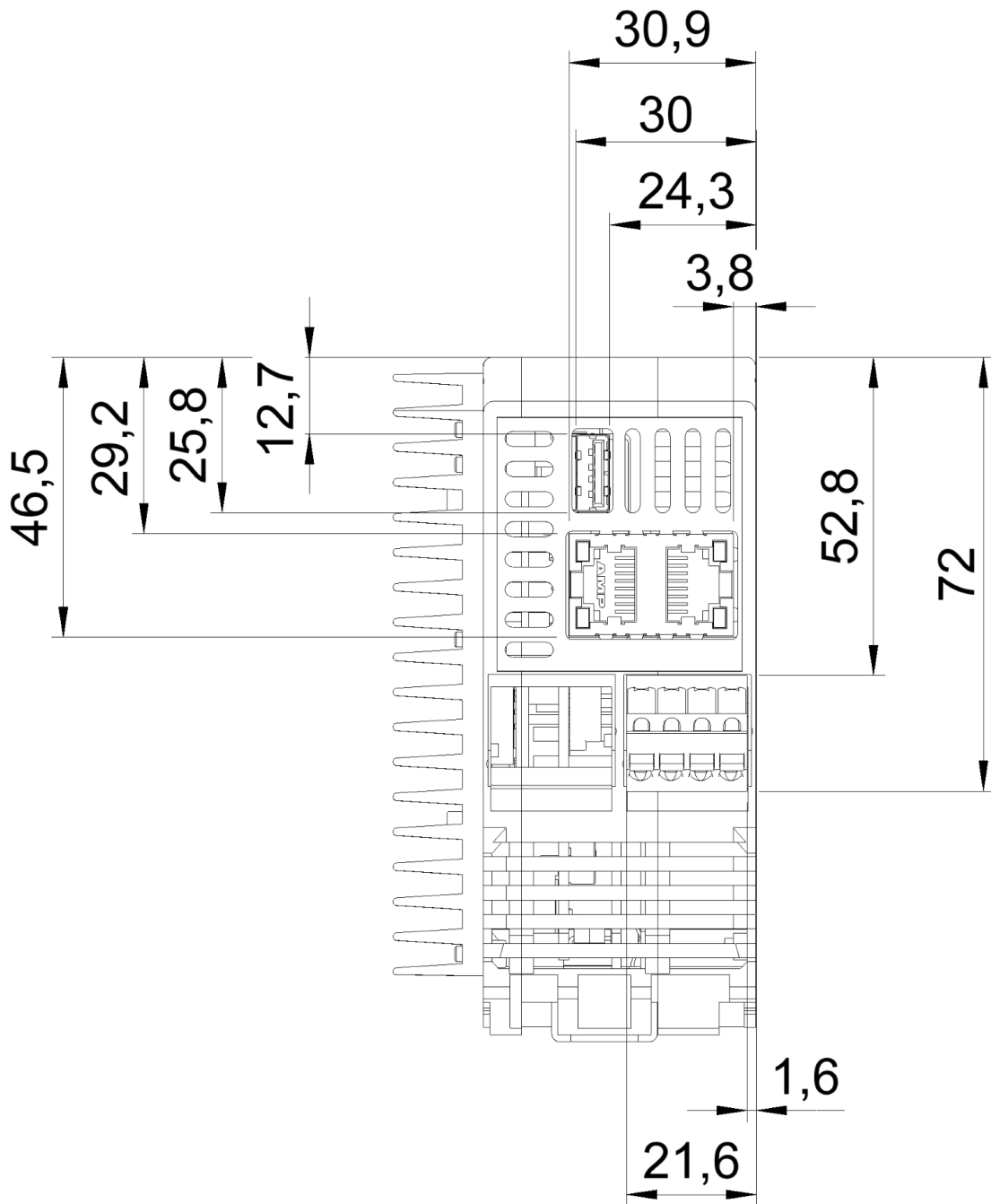
5.3.1.2 Rear view



5.3.1.3 Top view



5.3.1.4 Bottom view



## 5.4 Hardware features



The below features correspond to the hardware minimum configuration supplied with the product and tested from a functional point of view; any additional peripheral unit eventually available in the actual product is not guaranteed, neither from an operational nor from a functional point of view.

### 5.4.1 Basic hardware

<b>Processor</b>	Quad Core Intel® Atom™ x5-E8000 (1.04GHz)
<b>Memory</b>	2GB 1600MT/s DDR3L RAM
<b>Operating systems available</b>	Microsoft®Windows 10 IoT Enterprise / Linux
<b>Architecture</b>	Intel® 64
<b>Graphics</b>	Integrated (Intel HD Graphics Gen8)
<b>Connections and functionality</b>	1 x USB 3.0 (bottom side)
	1 x CFast socket (front side)
	1 x uSD socket (front side)
	1 x reset button (front side)
	3 x programmable LEDs (front side)

#### 5.4.1.1 CPC 0401

The CPC 0401 module is supplied without the CFast card. Following are the features in addition to the basic hardware:

<b>Connections and functionality</b>	1 x HMI port on a DVI-I connector (upper side) for HMI B1 panel
	1 x RS485 RJ45 (bottom side)
	2 x USB (on HMI port)
	1 x Ethernet 10/100/1000 Mb (bottom side)

### 5.4.1.2 CPC 0402

The CPC 0402 module is supplied with the CFast type programmed mass memory with specific operating system and software depending on the model. Below are the features in addition to the basic hardware:

<b>Connections and functionality</b>	1 x DVI-D output on a DVI-I type connector (upper side)
	2 x Ethernet 10/100/1000 Mb (bottom side)
<b>Graphics</b>	DVI-D single channel output (default digital video output set with a resolution of 1024 * 768 pixels)

## 5.5 Order codes

Order code	Model	Description
KZ010366	CPC 0401	FLXMOD - CPC 04 - HMI
KZ010609	CPC 0401	FLXMOD - CPC 04 - HMI
KZ010527	CPC 0402	FLXMOD - CPC 0402 - DVI
KZ010710	CPC 0402	FLXMOD - CPC 0402 - DVI

## 5.6 Accessories

CPC 04XX industrial computers are supplied with power connector and CR2032 button battery. The same can be ordered separately as well as other accessories not included in the CPC 04XX module.

The CPC 0402 computer comes with CFast memory and specific software.

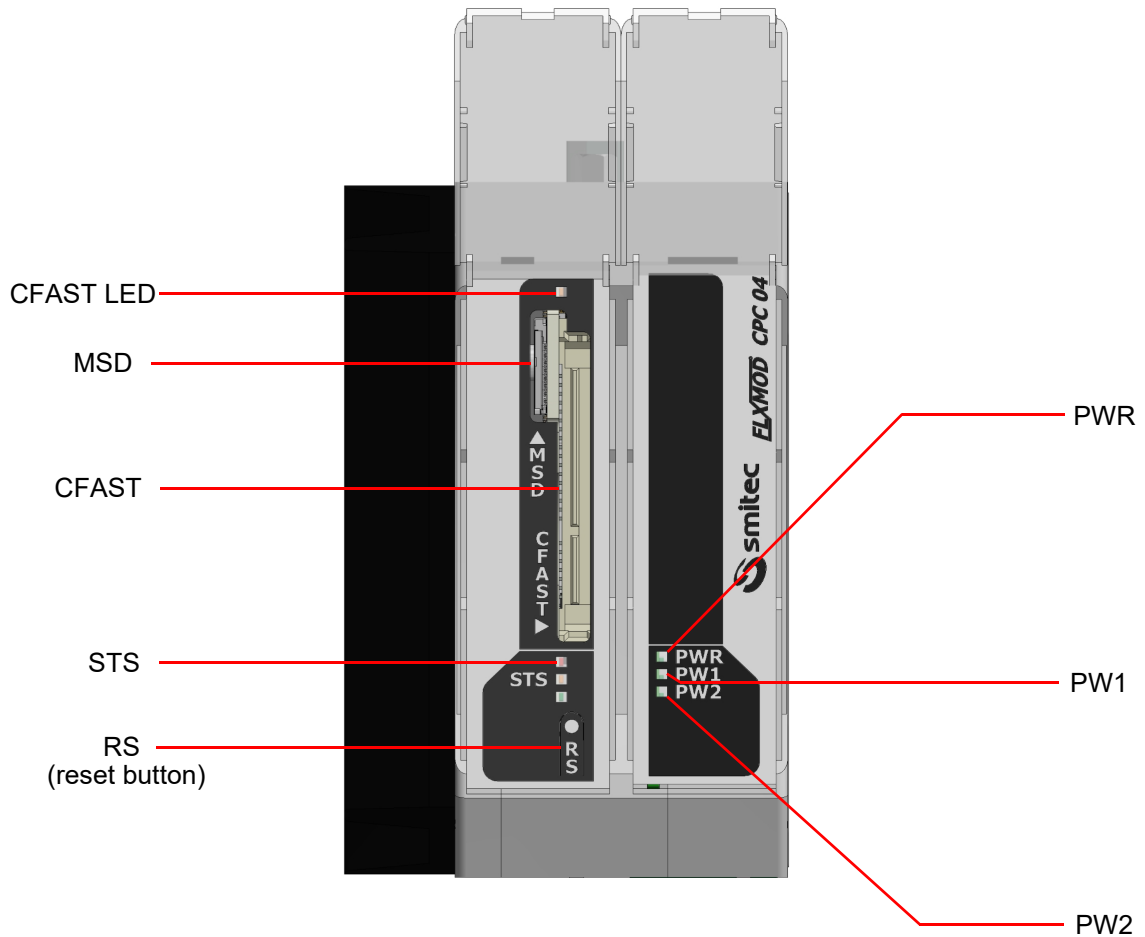
Here is a list of the order codes:

Order code	Item
KF100009	24VDC detachable connector (Phoenix Contact, cod. 1910377)
KE020031	Flash disk CFast type, 32GB capacity (empty)
KE020040	4GB Micro SD
KE020045	Flash disk CFast type, 64GB capacity (empty)
KE050067	32GB System CFast and operator interface; (interface software not installed)
KE050072	32GB system CFast and specific OPC software
KE050121	64GB system CFast and VLS Ethernet application with Diagos license
KZ010266	HMI B1 touch screen display panel
TB010554	CR2032 button battery



## 6 Connections and LEDs

### 6.1 Front view



#### 6.1.1 Connection references

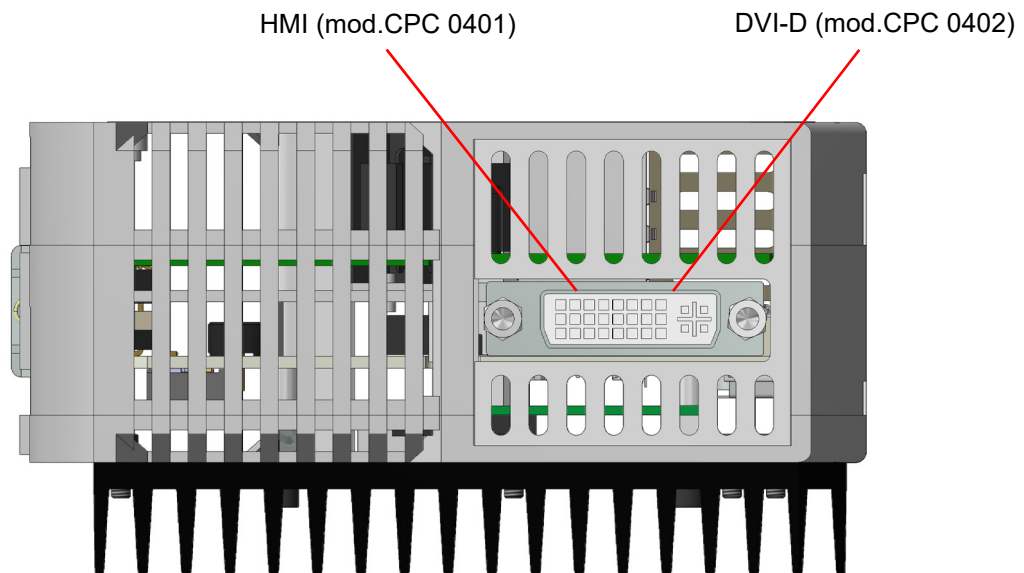
Name	Function
CFAST	Socket for CFAST memory slot
MSD	Socket for micro SD memory slot

6.1.2 Signalling LEDs

Name	Function
PWR	It indicates that the 24VDC main power supply is present and the protective fuse is not blown
PW1	It indicates that the internal power supply 1 (5 VDC) is present
PW2	It indicates that the internal power supply 2 (3.3 VDC) is present
CFAST LED	It indicates the system's access to the CFast memory
STS	Indicates the operating status of the system by means of programmable LEDs

6.2 Top view

Depending on the model, the outputs on the DVI-I connector are different:



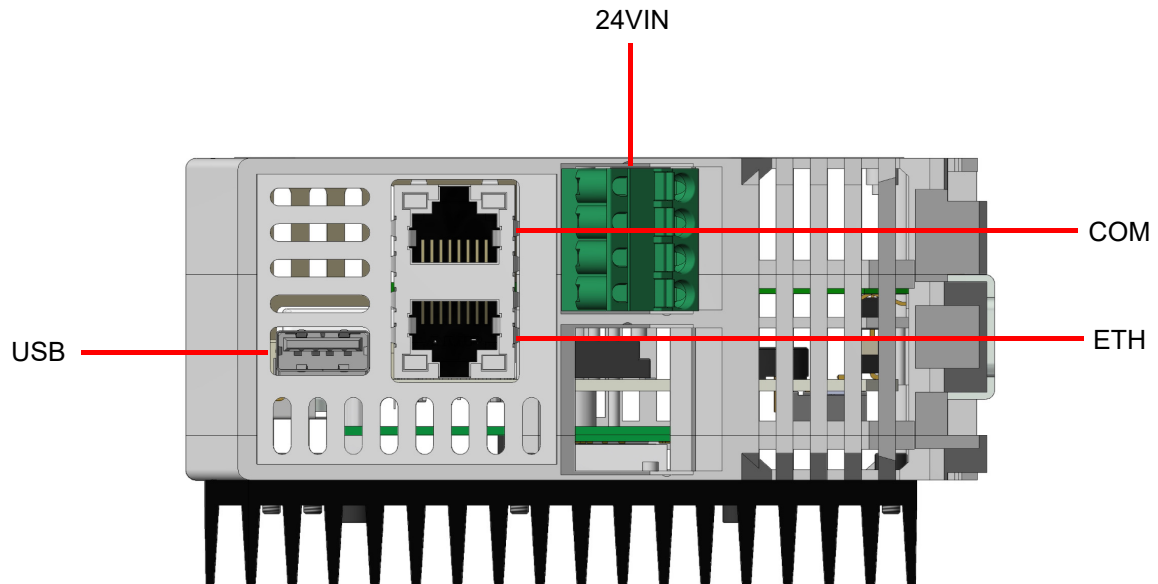
6.2.1 Connection references

Name	Function
HMI	Port for HMI B1 panel (mod.CPC 0401) *
DVI-D	Port for external monitor (mod.CPC 0402)

\*: in devices with order code KZ010609, in order to improve electromagnetic immunity, there is a delayed activation device for the touch-screen sensor integrated in the HMI B1 accessory (see chapter 5.6). The activation delay from turning on/restarting the device is factory set to 45s and can only be changed by updating the device firmware.

## 6.3 Bottom view

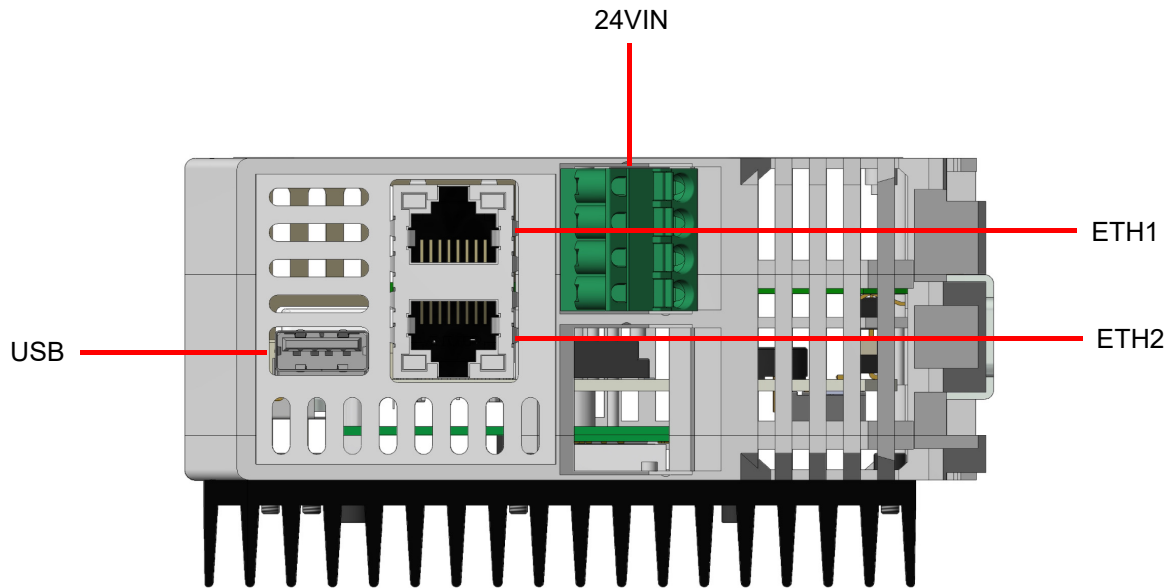
### 6.3.1 Model CPC 0401



### 6.3.2 Connection references

Name	Function
ETH	RJ45 Ethernet communication port
COM	RS485 serial communication port with RJ45 connector
USB	USB 3.0 port
24VIN	Input for 24VDC main power supply

6.3.3 Model CPC 0402



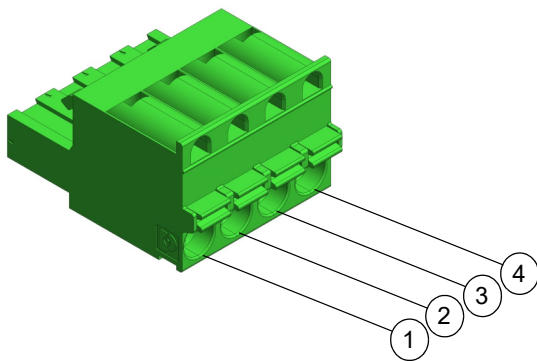
6.3.3.1 Connection references

Name	Function
ETH1	Ethernet communication port 1
ETH2	Ethernet communication port 2
USB	USB 3.0 port
24VIN	24VDC main power connection




### 6.3.4 24V IN power supply

The connector which powers the CPC 04XX module features spring contacts, in order to make the wiring of single cables easier.

Connector type: Phoenix Contact FKCT 2,5/4-ST (1910377)			
Order code: KF100009			
Features		Conductors cross section	
Connection in accordance with	EN-VDE	Solid min.	0,2mm <sup>2</sup>
Rated voltage	250V	Solid max.	2,5mm <sup>2</sup>
Rated current	12A	Stranded min.	0,2mm <sup>2</sup>
		Stranded max.	2,5mm <sup>2</sup>
Insulating material	PA	Stranded, with ferrule without plastic sleeve min.	0,25mm <sup>2</sup>
Inflammability class according to UL 94	V0	Stranded, with ferrule without plastic sleeve max.	2,5mm <sup>2</sup>
Stripping length	10mm	Stranded, with ferrule with plastic sleeve min.	0,25mm <sup>2</sup>
Screwdriver to be used for opening the connections	0,6 x 3,5mm	Stranded, with ferrule with plastic sleeve max.	2,5mm <sup>2</sup>



Supply 24V	
Pin	Signal
1	+24 Vdc
2	+24 Vdc
3	GND
4	GND

	<p>Use an adequately sized wire, according to the current flowing. A lower cross-section might cause fire, due to overheating caused by the wire.</p>
	<p>In order to meet the requirements of the EMC 2014/30/UE, the cable must not be longer than 30 meters.</p>
	<p>The CPC 04XX module is a high-tech electronic device, sensitive to electrostatic discharges (ESD). Take maximum care to prevent such discharges, by adhering to the prescriptions of the law, in order to avoid damages to the device.</p>

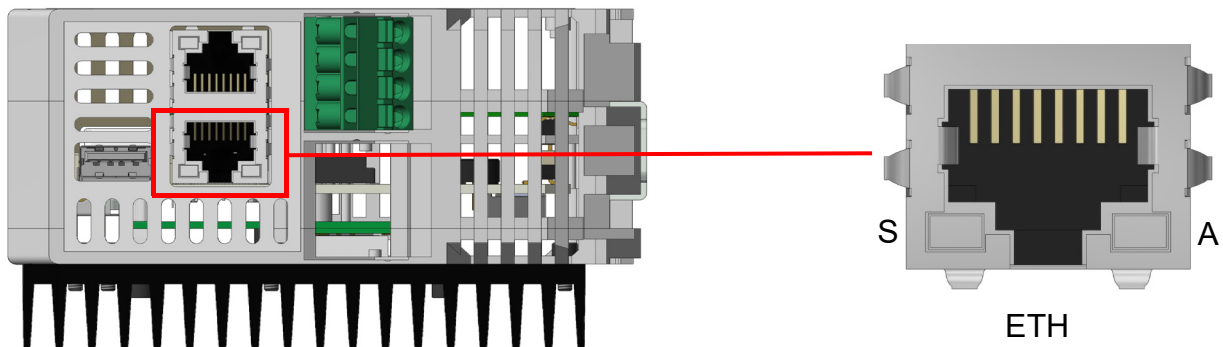
### 6.4 USB port

The USB connector is located on the underside of the module. The type of connector used is the most common type: type A USB 3.0. The USB 3.0 port is compatible with the USB 2.0 standard.

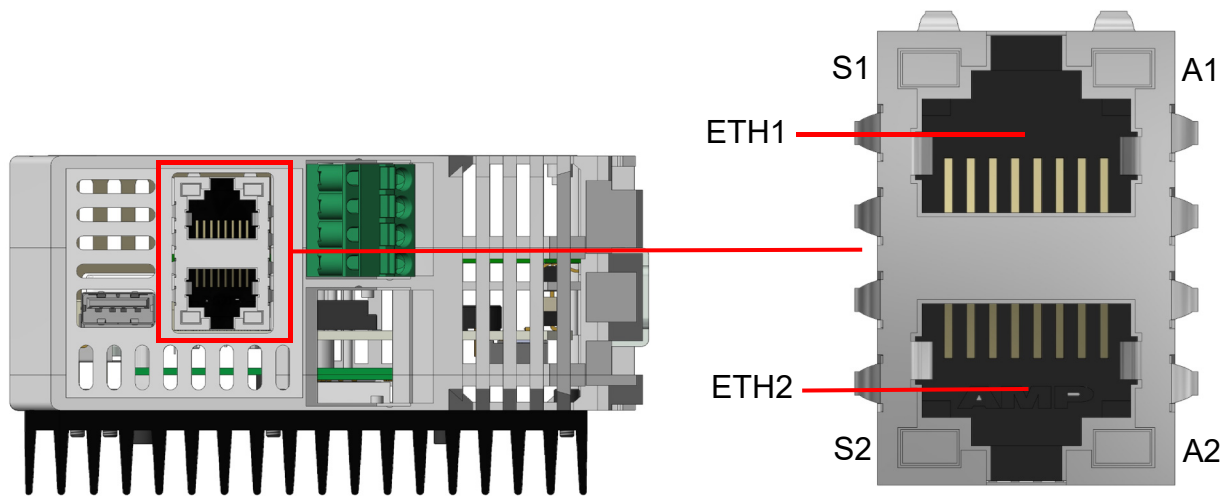
### 6.5 Ethernet port

Depending on the model, there are one or two 10/100/1000 Mbps Ethernet ports located at the bottom of the device that use standard RJ45 Ethernet connectors. It is therefore possible to use common Ethernet cables to connect the CPX 04XX module to the local network.

#### 6.5.1 Model CPC 0401



6.5.2 Model CPC 0402



Each Ethernet port has two LEDs. The first, marked by the letter S, indicates the communication speed of the port involved. It is a two-color LED (green / orange); according to the speed at which the Ethernet port is communicating, the LED takes on a different color. The second, marked by the letter A, indicates the state of activity of the port itself, or if the port is connected or if it is communicating.

6.5.2.1 Model CPC 0401

6.5.2.1.1 LED behavior of communication speed signaling

Name	State	Function
S	OFF	Ethernet port S communicating at a speed equal to 10 Mbps
S	ON (green LED)	Ethernet port S communicating at a speed equal to 100 Mbps
S	ON (orange LED)	Ethernet port S communicating at a speed equal to 1 Gbps

6.5.2.1.2 LED behavior for signaling connection and communication activities

Name	State	Function
A	OFF	A Ethernet port not connected
A	ON (orange LED)	A Ethernet port connected
A	BLINK OFF (orange LED)	A Ethernet port communicating

### 6.5.2.2 Model CPC 0402

#### 6.5.2.2.1 LED behavior of communication speed signaling

Name	State	Function
S1	OFF	Ethernet port S1 communicating at a speed equal to 10 Mbps
S2	OFF	Ethernet port S2 communicating at a speed equal to 10 Mbps
S1	ON (Green LED)	Ethernet port S1 communicating at a speed equal to 100Mbps
S2	ON (Green LED)	Ethernet port S2 communicating at a speed equal to 100Mbps
S1	ON (Orange LED)	Ethernet port S1 communicating at a speed equal to 1 Gbps
S2	ON (Orange LED)	Ethernet port S2 communicating at a speed equal to 1 Gbps

#### 6.5.2.2.2 LED behavior for signaling connection and communication activities

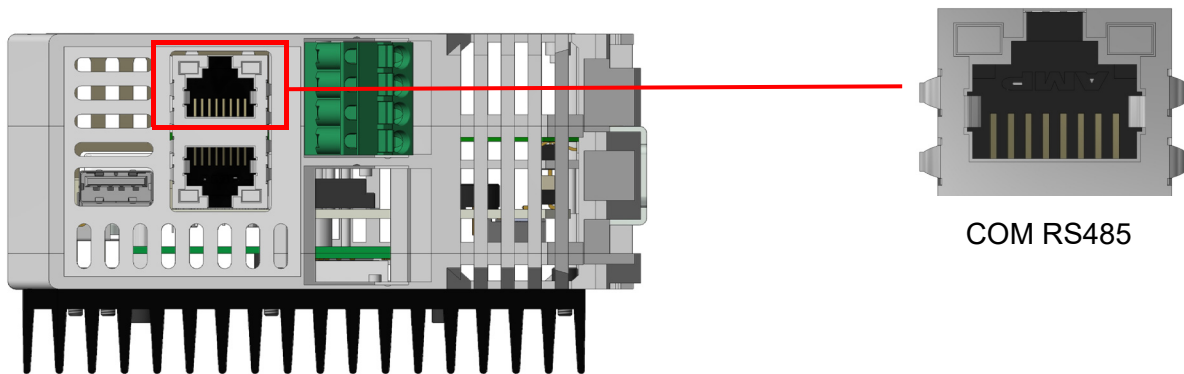
Name	State	Function
A1	OFF	A1 Ethernet port not connected
A2	OFF	A2 Ethernet port not connected
A1	ON (Orange LED)	A1 Ethernet port connected
A2	ON (Orange LED)	A2 Ethernet port connected
A1	BLINK OFF (Orange LED)	A1 Ethernet port communicating
A2	BLINK OFF (Orange LED)	A2 Ethernet port communicating



### 6.6 RS485 port

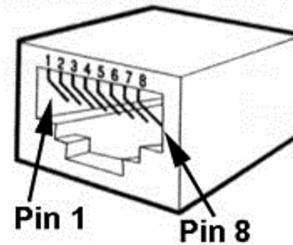
The RS485 serial port is located at the bottom of the device and for compactness, it uses an RJ45 connector with a specific pinout.

In this way it is possible to use a common Ethernet cable to connect the CPX 04XX module to the network.



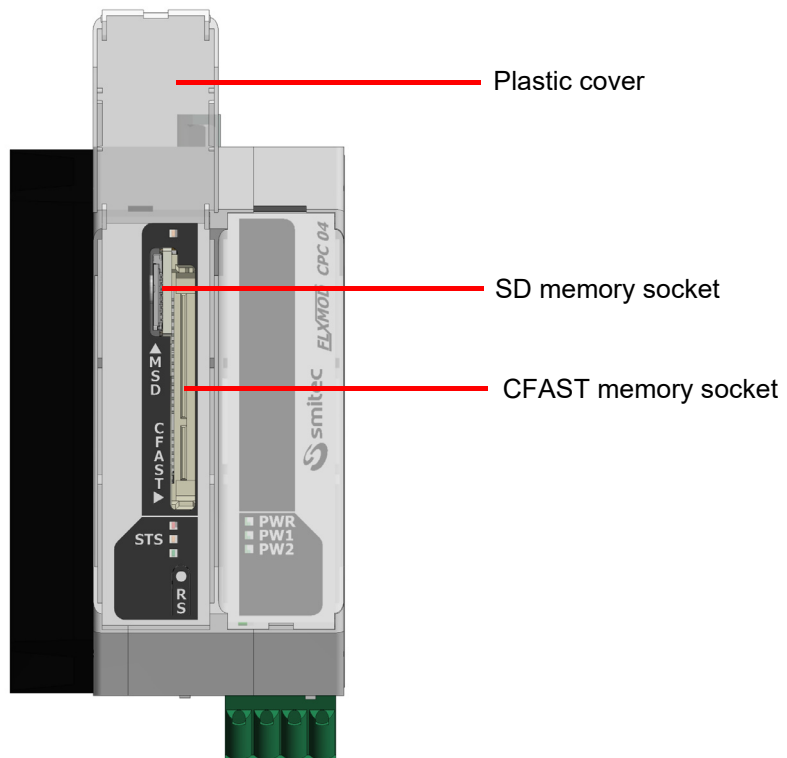
#### PINOUT COM RS485

Pin	Segnale
1	Data - RS485
2	Data + RS485
3	GND



## 6.7 Housing socket of CFAST card memory and micro SD (MSD) memory

The sockets for the CFAST memory and for the SD memory are located on front of the device. These memories are installed inside the device, behind a transparent plastic cover.



## 6.8 Reset button




The reset button allows the computer to be restarted immediately.



Pressing the button at an inappropriate time may result in data loss and/or damage to the operative system.

Use only if necessary.

## 7 Installation

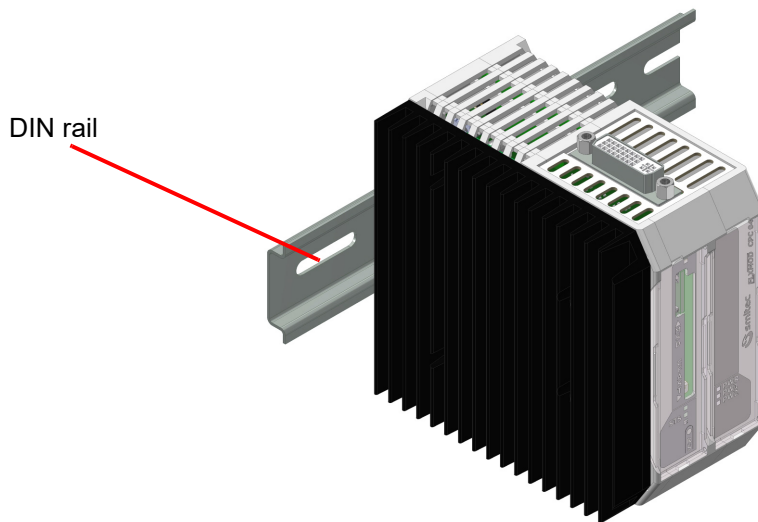
	<p>During installation of the FLXMOD CPC 04XX computer, falls and violent shocks must be avoided which could compromise the smooth operation.</p>
	<p>Avoid touching the input / output connectors on the computer panel directly unless you are equipped with suitable static electricity protection equipment; any discharges on the connectors could damage the appliance.</p>
	<p>Always carry out all electrical connections when the equipment is switched off: this will prevent damage to the computer and danger to the operator (exceptions to connections to the USB ports are possible).</p>
	<p>Always make sure that all the devices connected to the CPC 04XX have an efficient grounding (if foreseen by the device). Failure to follow this precaution could result in damage to the computer and danger to the operator.</p>
	<p>Do not position the device so that it is difficult to disconnect the wiring connected to it.</p>

### 7.1 Assembly

The CPX 04XX module, like all modules belonging to the FixMod system, are fixed to a DIN rail by means of a spring-loaded coupling system.

In the FixMod system, functional grounding (FE) is simply performed by hooking the module to the DIN rail.

Below is an example image:



## 7.2 Environmental requirements

In order for the system to operate properly, the CPC 04XX module must remain within the temperature limits indicated in the specifications. This means that, inside the electrical cabinet where the module is installed, there should be a suited cooling system in order to keep the temperature within the correct limits.

## 7.3 Electrical wiring

The main connections for the CPC 04XX operation are the power supply and the earth; make these connections following the instructions on polarity, conductors and connectors stated in the chapter "Connections". Before switching on the computer, make sure that the mains voltage is within the parameters indicated in the specifications.

The device connection to the peripheral units is simplified by the use of standard computer connectors; this means that all standard peripheral for personal computers can be connected by means of the cable supplied with them or by means of commercial cables easily found on the market.

For connections to non-standard devices, such as inverters or other that require particular combinations of signals and cable lengths, it is possible to make them following the instructions stated in the chapter "Connections".

## 8 Use

### 8.1 CFast card

The CFast card of the CPC 04XX module replaces the traditional hard disk, thus ensuring better shock tolerance and longer life of the device, also in case of continuous working cycles.

The flash card positioning and its easy removal/insertion allow quick replacement, both in case of failure or software off-line upgrade.



In order to avoid damages to the computer and/or CFast card loss of data, always switch off the module CPC 04XX before replacing the flash card.

### 8.2 Micro SD card

The micro SD card of the CPC 04XX module replaces the traditional hard disk, thus ensuring better resistance to shocks and longer life of the device.

The micro SD card positioning and their easy removal/insertion allow quick replacement, both in case of failure or software off-line upgrade.



In order to avoid damages to the computer and/or micro SD card loss of data, always switch off the module CPC 04XX before replacing the micro SD cards.

### 8.3 Priority of the start-up devices

A boot device is the CFast card or USB flash disk, or other mass storage on which the operating system (for example Windows) is stored by which the computer boots.

By default, the search for the operating system takes place first in the CFast, then in a possible USB flash disk.

The first device among these, which contains the boot information that an operating system needs, is used.

Therefore, if you want to boot the computer in a different sequence, you need to remove the other possible boot devices (eg by ejecting the CFast).

For the BIOS operating mode belonging to the CPC 04XX module, the boot sequence automatically adapts to the number or serial number variations of the boot devices; in fact, new devices, that is not present when the computer was first turned on, are inserted as last in the start sequence.

## 9 Ordinary maintenance

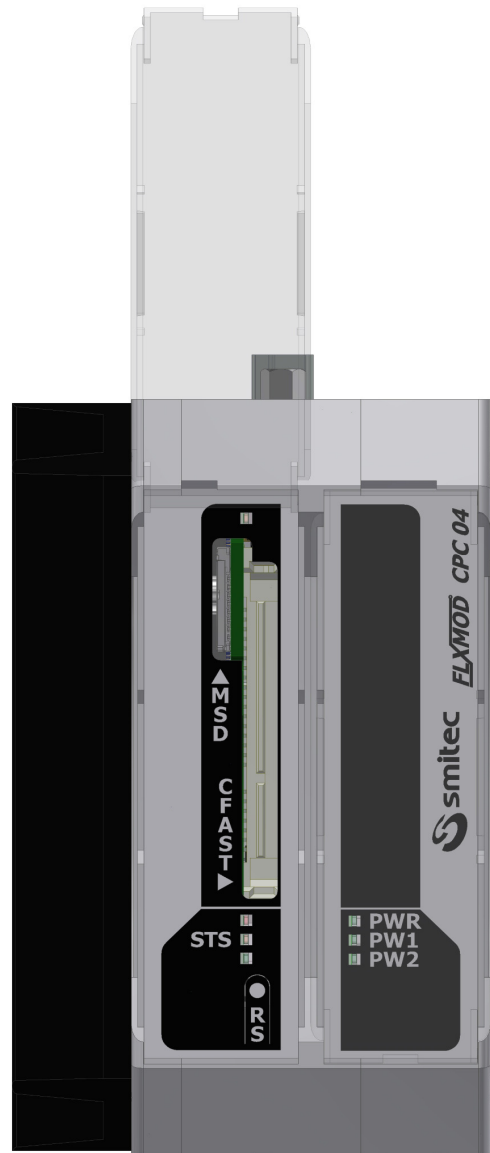
### 9.1 Clock battery replacement

The backup battery in the CPC 04XX module powers the RTC circuit (real-time clock). The RTC is a real-time clock which remains active even when the device is off and constantly updates the date and time. According to the ambient temperature and to the computer use, the battery can have a markedly different duration, starting from the CPC 04XX production date.

When the user realizes that the battery is exhausted, it can replace it in a few simple steps:

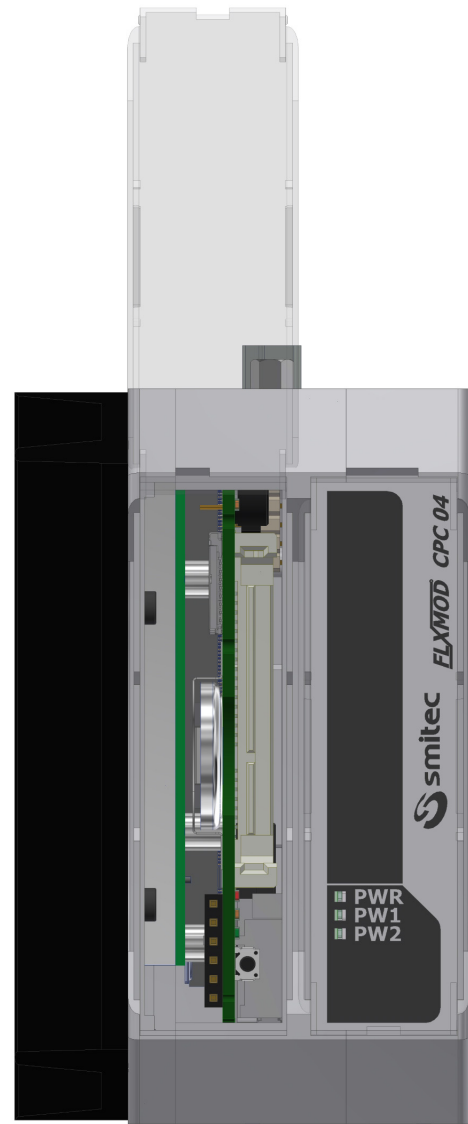
- **STEP 1**

Lift the transparent cover



- STEP 2

With a tweezers, gently lift the silk-screened plastic plate and remove it





• STEP 3

Gently remove the battery with pliers, being careful not to drop it into the device

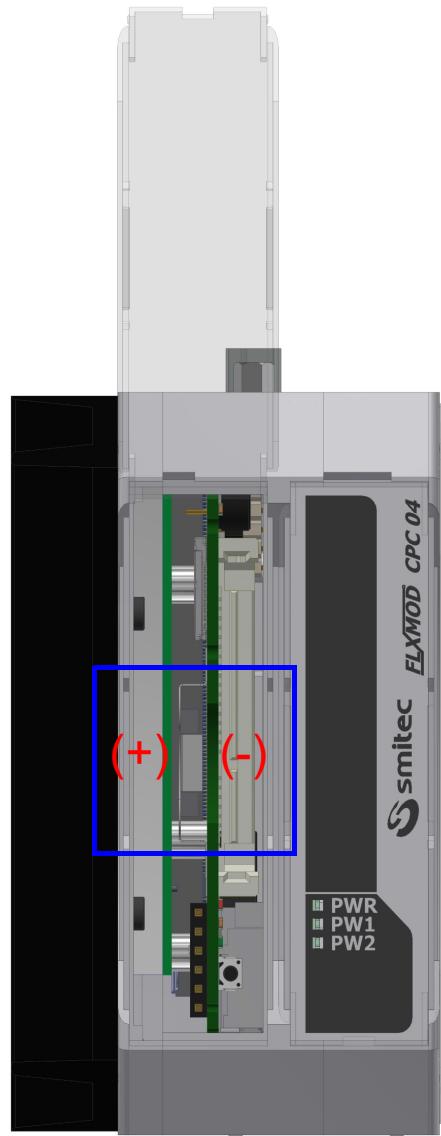
Insert the battery in the housing indicated in the figure, paying attention to the polarity and then to the direction in which the battery is inserted. See the following images:



Battery side with positive polarity (+):  
the pole (+) is facing the computer heatsink



Battery side with negative polarity (-):  
the pole (-) is facing the printed circuit of the internal card



Once the new battery has been correctly inserted, repeat each operation described in every part inversely.

Then manually update the date and time using the operating system.

## 10 Appendices

### 10.1 Appendix I: CMOS Setup parameters

In the CPC 04XX module, the CMOS Setup parameters are stored in the BIOS and are password protected to guarantee operation.

In the event that a loss of the CMOS setup parameters occurs, for example due to running out of the buffer battery, these will automatically reset when the device is turned back on, while the date and time will have to be updated manually using the operating system.

If necessary, the CMOS setup password can be requested from the service department.

## 11 Analytical index

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