



POSYC

4000 SERIES

INSTALLATION AND MAINTENANCE MANUAL

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1 INTRODUCTION

1.1 Important warnings





Before using the equipment described in this manual, the user is recommended to carefully read all instructions concerning installation and start-up, as well as the use and maintenance modes.

SMITEC S.p.A. declines all responsibility for damages to things or injuries to people, due to the negligent use of the equipment and/or due to the violation of the rules mentioned in this manual.

1.2 Manual contents

This manual describes the POSYC features and the installation and ordinary maintenance modes.

Here are the symbols adopted in the text:

- Safety or operating instructions of special importance are preceded by the symbol  and the text is in bold characters;
- All information of special importance concerning the equipment is preceded by the symbol .

1.3 Product description

The **POSYC** is a x86-based personal computer, mainly designed for an easier interface communication between man and machine (HMI) in an industrial environment, but thanks to its characteristics it is ideal for different uses, such as information terminals and automation systems in general.

The user interface is mainly based on a flat colour display and a touch screen pointing system.

The 15" TFT liquid crystal display offers a large display, great brightness, brilliant colours and a good visual angle.

The touch screen system is very resistant and easy to be used, unlike the common pointing peripheral units, such as the mouse, the track-ball and the mouse pad.

Being totally integrated in the **POSYC**, the screen is ideal for industrial applications requiring high resistance to dust, humidity, water, oil etc., which would damage the standard peripheral units.

It is enough to slightly press your finger on the screen in order to make an immediate pointing: this is the main "user friendly" feature of the **POSYC**.

In order to meet the different needs of interfacing, the **POSYC** also offers the possibility to connect standard input/output peripheral units, such as the keyboard, the mouse, the track ball, the monitor, etc.

In its minimum configuration, the **POSYC** can communicate externally via 2 standard RS232 serial ports and 1 RS485 port; it also features 4 standard USB 2.0 ports, 2 USB 2.0 ports with IP65 protection (front side), 2 Ethernet ports 10/100/1000Mb.

Depending on the version, the following ports can be available: 1 Web Cam 2Mpx, 1 WiFi 802.11B/G/N.

The **POSYC** calculation capability relies on the Dual Core Intel® Atom® D2550 1.86GHz processor, with 2GB RAM memory.

The data and programme storage on non-volatile support is provided by a couple of CFast Card (solid-state, flash-type, high-speed memories), 2GB each. The position of the two devices inside the **POSYC** is such that they can be withdrawn without opening it. The main advantage of the CFast Cards is their exceptional resistance to accidental shocks and vibrations.

The new design makes it particularly appealing also for non industrial applications.



2 TECHNICAL SPECIFICATIONS



All technical information contained in this section corresponds to the hardware configuration of the **POSYC** manufactured on the date when this manual was drawn up. To improve or update the **POSYC**, SMITEC S.p.A. reserves the right to modify its technical features without notice.

2.1 Electrical specifications

The below mentioned features only refer to the standard **POSYC**, without any peripheral unit connected.

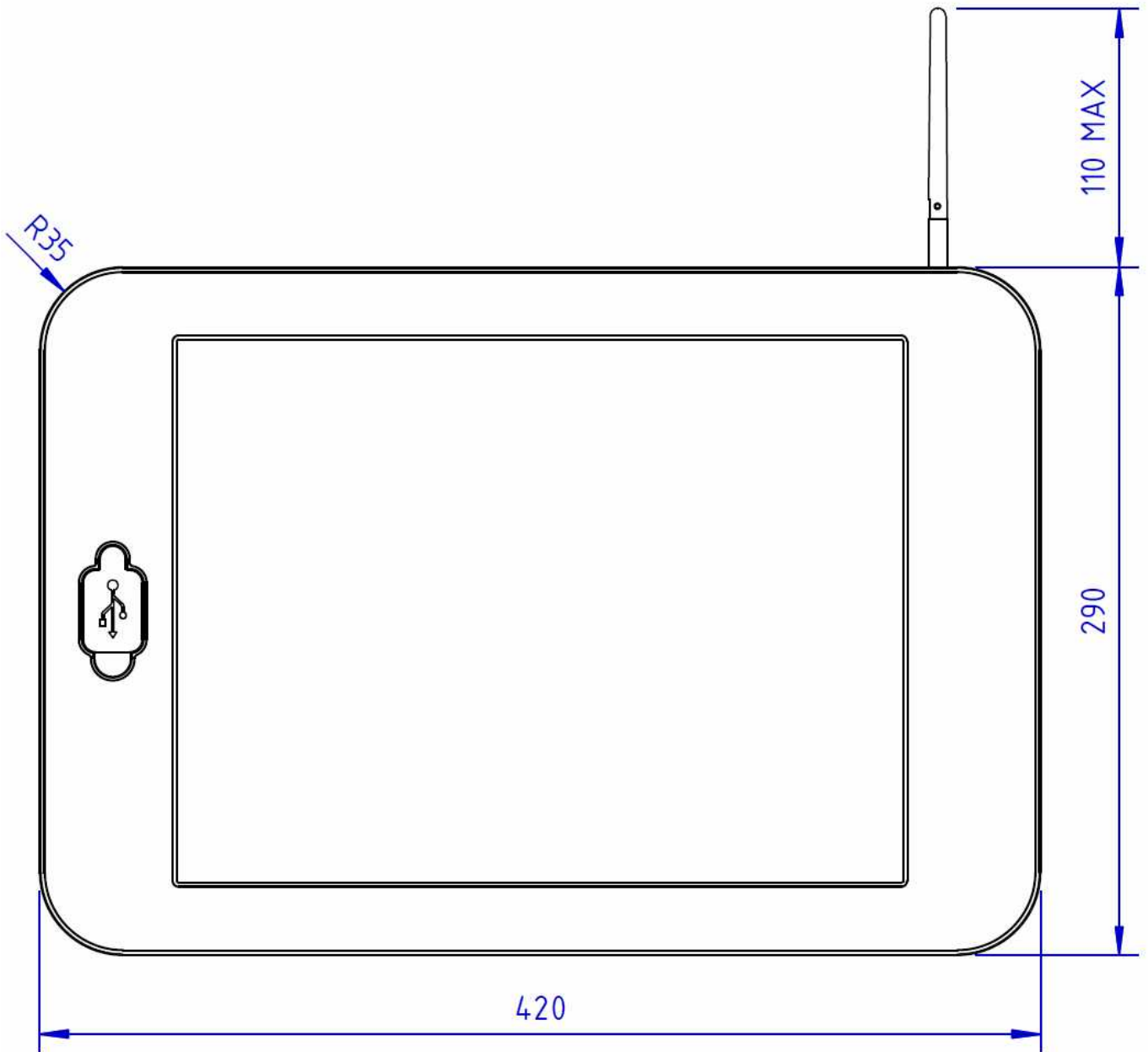
MAINS VOLTAGE	24 VDC \pm 10%
ABSORBED CURRENT	MAX 1,25A @ 24VDC
ABSORBED POWER	MAX 30.0W

2.2 Environmental specifications

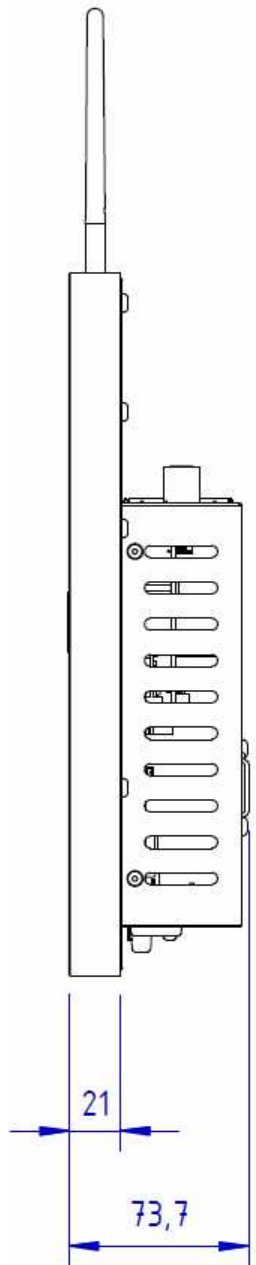
(OPERATING) TEMPERATURE	0 \div +45°C
(NOT OPERATING) TEMPERATURE	-20 \div +60°C
HUMIDITY	10 \div 90% (WITHOUT CONDENSATION)
PROTECTION DEGREE	IP65 (PANEL-MOUNTED OR INSTALLED IN A DEDICATED HOUSING)

2.3 Mechanical specifications

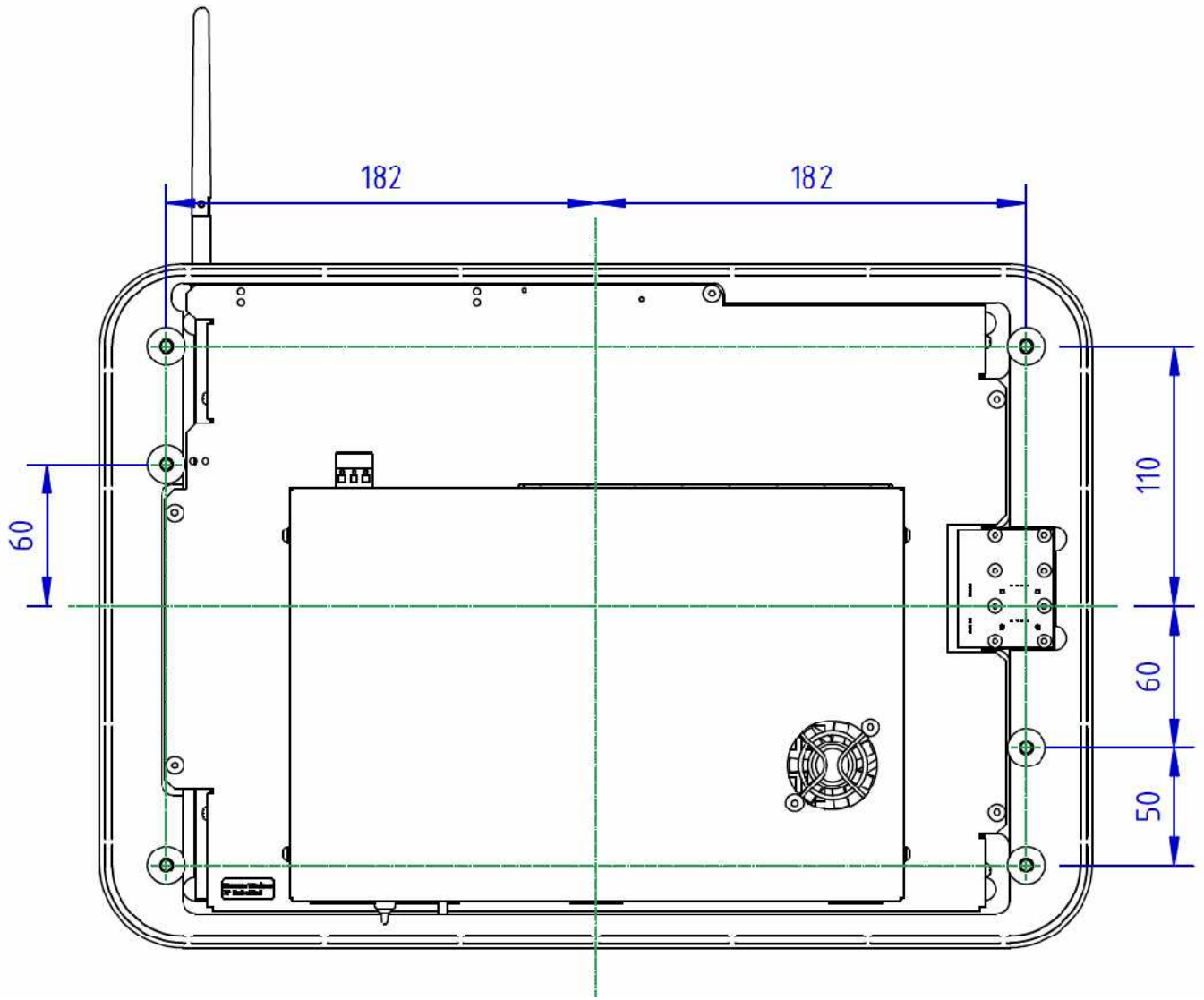
FIXING	6 THREADED HOLES M5
WEIGHT	5,0 KG



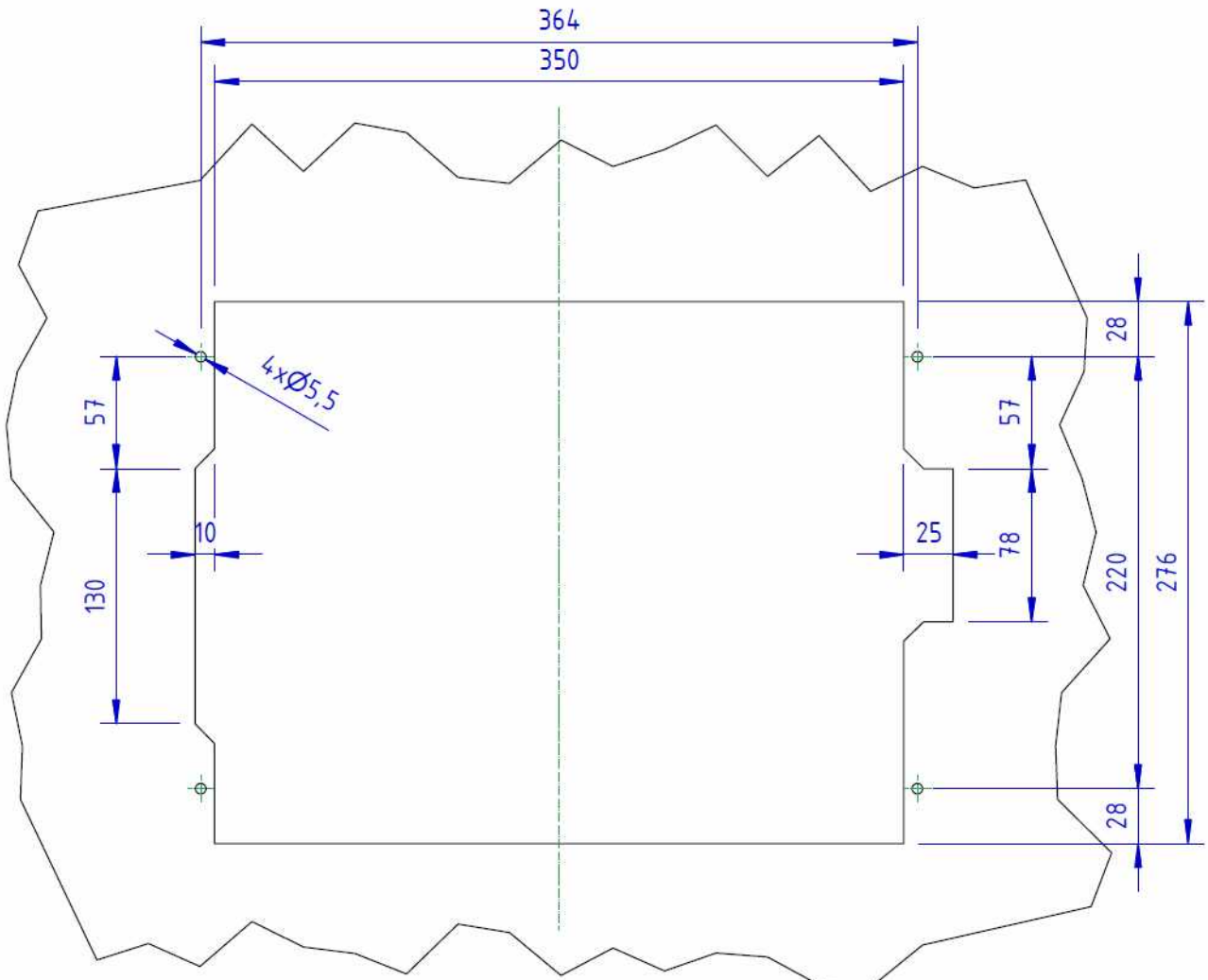
Mechanical dimensions (front view)



Mechanical dimensions (side view)



Mechanical dimensions (back view)



Recommended panel cutting (back view)

2.4 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 units present in the product are not guaranteed, from an operational and functional point of view.

Posyc Model 420X

MICROPROCESSOR	DUAL CORE INTEL® ATOM® D2550 1.86GHZ
RAM	SODIMM DDR3 2GB 1066MHZ
CFAST CARD 1	2GB
CFAST CARD 2	2GB
DISPLAY	15", 16M COLOURS 400CD/MQ 1024x768PX LED
TOUCH SCREEN SENSOR	5 RESISTIVE CABLES
TOUCH SCREEN CONTROLLER	SERIAL PORT ON COM4
SERIAL PORT COM1	RS485 NOT INSULATED
SERIAL PORT COM2	RS232C
SERIAL PORT COM3	RS232C
BACK USB PORTS	2.0
FRONT USB PORTS	2.0
ETHERNET PORTS	10/100/1000MBPS

Posyc Model 4201

The same as model 420X, with the following additional features.

WEBCAM	2.0MPX USB
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Posyc Model 4202

The same as model 420X, with the following additional features.

WI-FI LAN	802.11B/G/N WITH EXTERNAL ANTENNA
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Posyc Model 4203

The same as model 420X, with the following additional features.

WI-FI LAN	802.11B/G/N WITH EXTERNAL ANTENNA
WEBCAM	2.0MPX USB

2.5 Order codes

Order code	MODEL	Description
KZ010330	4200	Posyc series 4000, basic release
KZ010331	4201	Posyc series 4000, basic release + WebCam 2Mpx
KZ010332	4202	Posyc series 4000, basic release + WI-Fi Lan 802.11b/g/n
KZ010333	4203	Posyc series 4000, basic release + WebCam 2Mpx + WI-Fi Lan 802.11b/g/n

2.6 Accessories

The Posyc 4000 industrial computers are supplied with power connector and mass memories. The connector and the memories can also be ordered separately, like the other accessories not included in the Posyc.

Here is a list of the order codes.

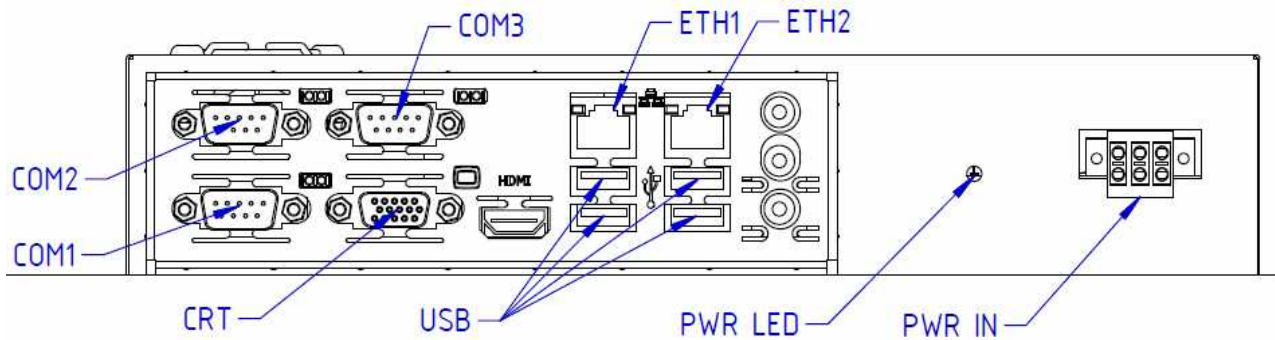
Item	Order code
24VDC connector (Phoenix Contact 1713842) *	KF100038
CFast Card 2GB - empty *	KE020029
Lithium button battery CR2032 - 3V *	TB010554
Posyc housing with VESA mount, without keyboard	KG020084
Posyc housing with VESA mount + keyboard housing	KG020082
Keyboard without housing, with white key, black key, blue illuminable key, emergency key	KZ010334
Spacer for fixing the Posyc to the housing *	MA117784
External antenna for Wi-Fi Lan **	KY010070
Anti-dust cover for front USB ports *	MA903498
Front gasket - diameter 3.0mm (1,5m) *	MF101475

* = supplied with the Posyc

** = supplied with Posyc models 4202 and 4203 only

2.7 Connections

Most of the connectors are situated at the top of the POSYC.

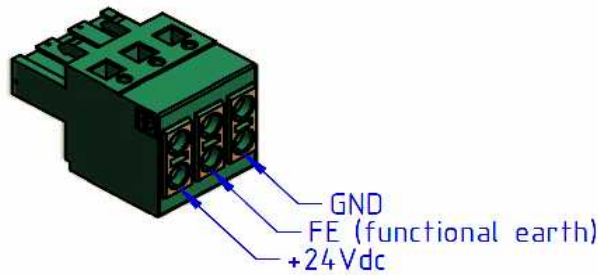


Panel upper view

Name	Function
COM1	Serial port RS485 #1
COM2	Serial port RS232 #2
COM3	Serial port RS232 #3
CRT	Analog port for external monitors
ETH1	Ethernet port #1
ETH2	Ethernet port #2
USB	4 x USB Ports
PWR LED	Green led indicating power presence
PWR IN	Power connection

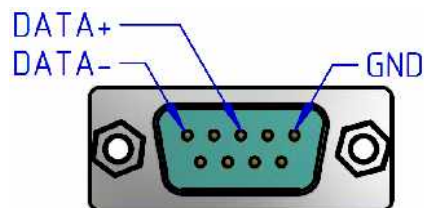
PWR IN Connector

Connector type: Phoenix Contact TVFKC 1,5/3-ST (1713842)			
Order code: KF100038			
Features		Conductor cross section	
Connection in accordance with	EN-VDE	Solid min.	0,2mm ²
Rated voltage	250V	Solid max.	1,5mm ²
Rated current	10A	Stranded min.	0,2mm ²
		Stranded max.	1,5mm ²
Insulating material	PA	Stranded ferrule without plastic sleeve, min.	0,25mm ²
Flammability rating (Standard UL 94)	V0	Stranded ferrule without plastic sleeve, max.	1,5mm ²
Stripping length	8mm	Stranded ferrule with plastic sleeve min.	0,25mm ²
Screwdriver to be used in order to open the connections	0,6 x 3,5mm	Stranded ferrule with plastic sleeve max.	1,5mm ²



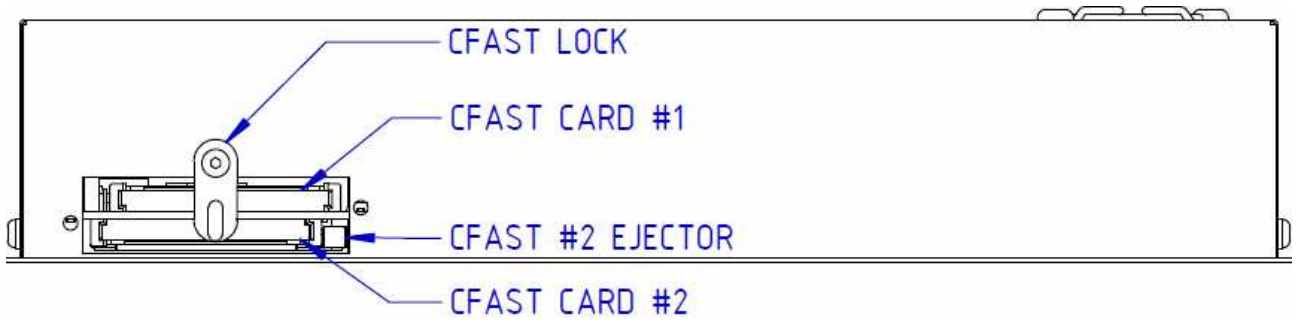
Serial Port COM1 RS485

Connector type: D-SUB SD9 F (not supplied)			
Order code: -----			
Features		Conductor cross section	



***C*Fast card connectors**

At the bottom of the POSYC there are the connectors for the CFast card memories. The memories are fixed inside the computer by means of a locking lever and the connector of the CFast #2 (generally used for data and programme storage) is equipped with an ejector, in order to extract it more easily.



Panel bottom view

3 INSTALLATION



During the **POSYC** computer installation, avoid violent collisions and falls which may compromise the regular operation.



Since the front panel integrates the touch screen sensor, violent strokes might damage it irreparably and might generate sharp glass fragments, which are dangerous for the operator.



Do not touch the input/output connectors located on the side panel of the computer, unless you are equipped with safety protections against static electricity; any discharge on the connectors might damage the computer.



Always switch the computer off, before making all electrical connections; this will avoid any damage to the computer and any danger to the operator (the connection to USB ports can be an exception).



Always make sure that all devices connected to the **POSYC** have got an efficient earthing (if the device has got one). If you do not follow this recommendation, the computer might be damaged and the operator might be in danger.

3.1 Panel-mounted POSYC

The **POSYC** can be panel-mounted, by positioning the recommended cutting on a robust panel, supporting the weight and ensuring a correct planarity once the computer is installed. Lack of planarity or surface roughness $> 3.2\mu\text{m}$ can compromise the efficiency of the round gasket installed around the **POSYC** frame.

For the installation, use 4 steel screws M5 (not supplied); threaded holes size: 10mm.

3.2 POSYC mounted in a dedicated housing

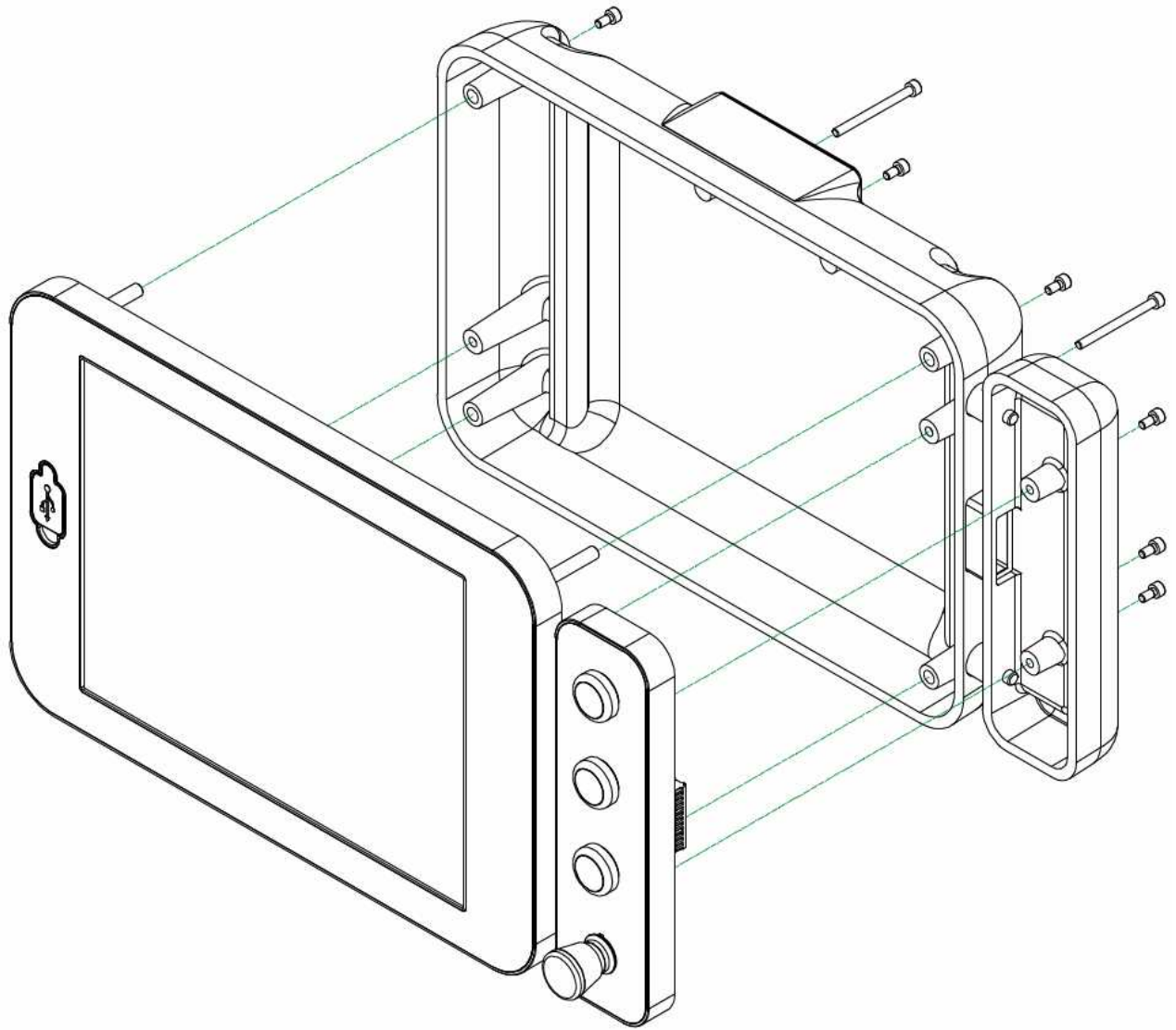
The **POSYC** can be mounted in one of the two dedicated aluminium housings (see specific chapter for the order codes).

Both housings are pre-arranged for being fixed to an arm dimensioned according to “VESA MIS-D,100,T”. In order to fix the housing to the arm, use 4 steel screws M4x10mm (not supplied).

Position the **POSYC** and tighten the spacers MA117784 (supplied with the computer) by means of thread-lockers, in the 4 corners of the frame. For a correct tightening, use a single open end wrench - 6mm.

Position the **POSYC** onto the housing, by sliding the spacers in their specific housing and tighten the computer by means of the screws M5x60mm (MF300543 supplied with the housing) in the intermediate holes. In order to block the computer, screw the 4 screws M5x10mm (MF300168 supplied with the housing) in the corner holes.

In order to inspect the connections and the CFast without totally removing the computer from the housing, remove the 4 screws and slide the computer along the spacers.



Example of installation in a dedicated housing with keyboard

3.3 Environmental requirements

The *POSYC* is designed for being installed in a housing, in order to be protected against water and dust, which might damage it.

The *POSYC* is cooled by a high-speed fan sucking up the air from the pc rear side; the system can operate properly if it remains within the ambient temperature limits indicated in the specifications. To this purpose, the panel including the *POSYC* must feature adequate cooling systems, in order to keep the temperature within the correct limits.

The dedicated housings are designed in such a way as to never exceed the maximum temperature limits, therefore, they do not need further cooling systems.

3.4 Electrical connections

The main connections for the **POSYC** operation are the power supply and the earth; make these connections by following the instructions on polarity, conductors and connectors contained in the chapter “Connections”. Before switching on the computer, check that the mains voltage is within the parameters indicated in the specifications.

The POSYC connection to the peripheral units is easier if you use standard computer connectors; this means that all standard peripheral units for personal computer can be connected by means of the cable supplied with the peripheral units or by means of commercial cables which can be easily found on the market.

For connections to non-standard devices, such as inverters, requiring particular combinations of signals and cable lengths, it is possible to create what is needed, by following the instructions contained in the chapter “Connections”.


Some notes about cable wiring for the serial communication are mentioned here below

Standard serial ports RS232 wiring

This type of connection can only connect two devices and the wiring can be made by a variable number of conductors, according to your needs.

According to the standard RS232 specifications, the maximum cable length is 15mt, at a transfer speed rate of 20Kbps. Please consider that the cable length is inversely proportional to the communication speed rate.

The twisted couples of conductors are generally used to transfer a signal and its reference (ex. TD and GND); the GND connection is essential for a proper operation.

 It is recommended to connect the shield of the cable you are using to only one extremity (preferably on the computer side); this will prevent potential differences between the two devices from creating a current circulation on the wiring shield, with consequent communication interferences; in some applications, it is however possible to make the connection to both extremities. By contrast, if you do not connect the shield to earth (disconnected from both the extremities) the shield will lose its function.


Serial ports RS485 wiring

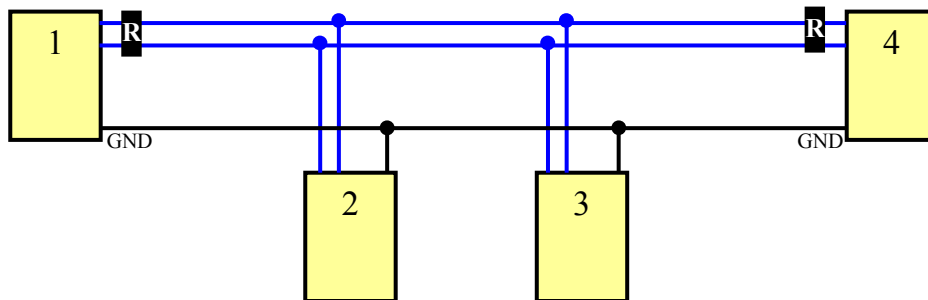
The RS485 ports are typically used in multipoint configuration, which means that several devices are connected to one another; this type of connection only implies one couple of connectors; as a consequence, the communication is half-duplex.

Through the serial ports RS485, it is possible to connect up to 32 devices (including the master) in a single route, offering a good immunity to interferences and an excellent maximum transmission rate.

According to the RS485 standard specifications, the route maximum length is 1200mt at a maximum transmission speed of 100Kbps. Take into account that the route length is inversely proportional to the communication speed.


Through appropriate repeater devices (not more than 9) it is possible to extend the connection and to connect up to 126 devices.

 For a correct operation, it is recommended to use an adequate cable, by terminating it appropriately. The termination is carried out by connecting at the beginning and at the end of the route, some resistors having a defined value of 120ohm; by the beginning and the end of the route, we mean respectively the master and the most remote slave (called 1 and 4 in the picture). The cable length which from the main line connects some intermediate devices (called 2 and 3 in the picture) must be the shortest length possible (in any case below 1mt), otherwise the signal quality will be degraded. The termination resistors of the RS485 serial ports of the *POSYC* are not connected.



Example of RS485 wiring

Besides the couple of conductors necessary for the communication, an additional conductor which connects the grounds reduces the risk of damages to the non-insulated ports which might be included in some devices with ground references very different from one another.

 It is recommended to connect the shield of the cable to only one extremity (preferably on the computer side); this will prevent potential differences between the two devices from creating a current circulation on the wiring shield, with consequent communication interferences; in some applications, it is however possible to make the connection to both extremities. By contrast, if you do not connect the shield to earth (disconnected from both the extremities) the shield will lose its function.

RS422 serial port wiring

The RS422 serial port is typically used in “point-to-point” way, like the RS232, but it relies upon a very resistant interface like the RS485, which can reach considerable distances and speed rates. Unlike the RS485, the RS422 uses two couples of conductors; therefore, the communication can be full-duplex.



For a correct operation, it is recommended to use an adequate cable, terminating it appropriately. The termination is carried out by connecting some resistors having a defined value of 120ohm at the end of the route (close to the receivers). The termination resistors of the RS422 serial ports of the *POSYC* are not connected.



Example of RS422 wiring

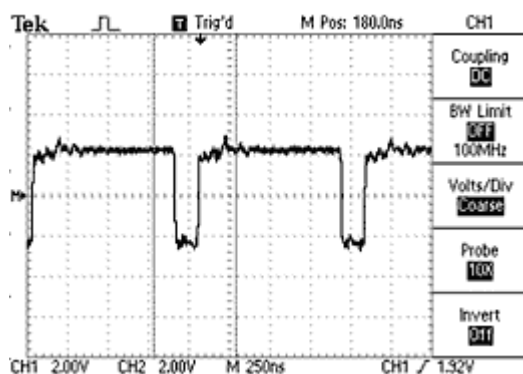
Besides the couple of conductors necessary for the communication, an additional conductor which connects the grounds reduces the risk of damages to the non-insulated ports which might be included in some devices with ground references very different from one another.



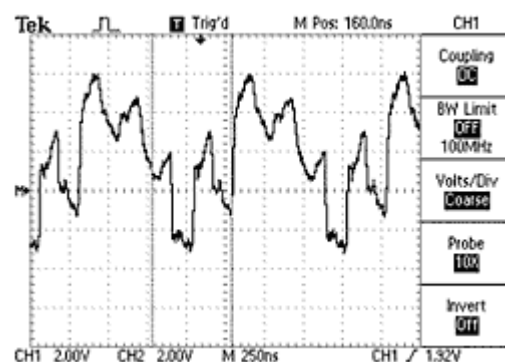
It is recommended to connect the shield of the cable to only one extremity (preferably on the computer side); this will prevent potential differences between the two devices from creating a current circulation on the wiring shield, with consequent communication interferences; in some applications, it is however possible to make the connection to both extremities. By contrast, if you do not connect the shield to earth (disconnected from both the extremities) the shield will lose its function.

Serial signals of ports RS422, RS485

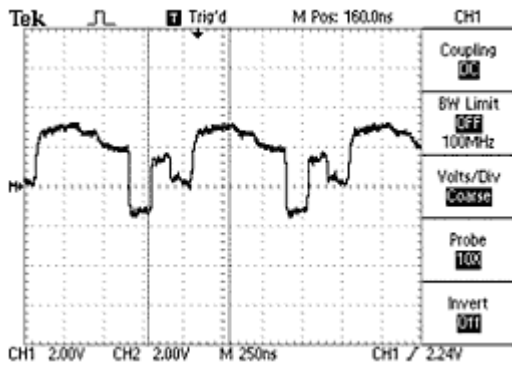
The following figures show the wave form detected through an oscilloscope in different connection situations.



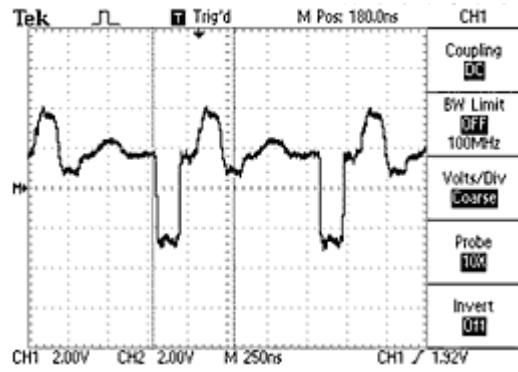
Example of correct signal



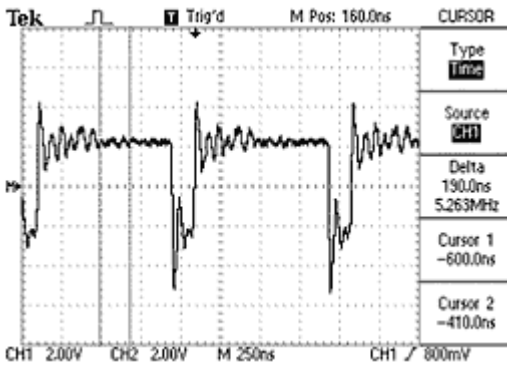
Example of signal with non terminated lines



Example of signal with terminations located on wrong device



Example of signal with terminations with wrong value



Example of signal on intermediate devices with long connections

4 USE

4.1 Touch screen

The use of the *POSYC* computer is very similar to a normal computer; the only difference consists in the touch screen pointing device, which makes the *POSYC* “user friendlier”



Operate the touch screen sensor by means of your fingers or of soft devices; do not use sharp objects, because the sensor would be damaged.

In order to operate the touch screen, it is enough to slightly press on it (it is like a sheet of glass), in order to have the pointing device of the operating system move below the pressed zone. Depending on the software setting, the touch screen simulates the dragging, the click, the double click and the right click of the mouse. Make reference to the software manual for further details.

4.2 Front USB ports

The front USB port has been designed for the connection of temporary-use devices, such as the keyboard and the flash disk; the connector in use guarantees an IP65 protection degree of the computer, both during operation and during pause conditions.



In order to avoid oxidation of the contacts of the front USB connectors, always cover the connectors with the specific cap after using them.

4.3 CFast card

The CFast cards of the *POSYC* replace the traditional hard disk, thus ensuring a better shock tolerance and a longer life of the *POSYC*, even in case of continuous working cycles.

The positioning of the flash cards and the very easy way of removal/installation ensure a quick replacement, in case of break-down or software off-line updating.

The slot CFast #1 houses the flash card for the operating system storage; the slot CFast #2 houses the flash card including the machine specific software (please refer to the software manual for further details or exclusions).



In order to avoid problems with the computer and/or CFast card data loss, always switch the *POSYC* off before replacing the flash cards.

4.4 Priority of the start-up devices

“Start-up device” refers either to the CFast card, or to the USB flash disk or to other mass memories where the operating system is stored (example: Windows), which start-up the computer.

In the standard supply, the operating system research first occurs in the CFast #1, then in the CFast #2, then in the flash disk USB. The first device containing the start-up information is used.

Therefore if you want to start up the computer according to a different sequence, it is necessary to modify the setting in the CMOS setup or remove any other start-up devices (for example, by removing the both Cfast cards).

According to the functioning mode of the **POSYC** BIOS, the start-up sequence automatically follows the variations of the number of start-up devices; in fact, the new devices, that were not present at the previous start-up, are entered as the last ones in the start-up sequence.

As a consequence, if you replace for example the CFast #1 containing the operating system, the CFast #1 will not be used for the next start-up; therefore, it is necessary to correct the CMOS setup or temporary disconnect the other start-up devices.

If you need to enter the CMOS setup by using the USB keyboard connected to the **POSYC**, press the key Del/Delete as soon as the Smitec logo is displayed; go to the menu Boot, enter the sub-menu Hard Drive BBS Priorities and set the required device as Boot Option #1 (for example, for the CFast #1 set SATA PM:.....).

5 ORDINARY MAINTENANCE

5.1 Touch-screen sensor cleaning

The touch-screen sensor must be cleaned frequently, in order to remove the dirt caused by the hands or by any material in contact with the surface and to keep the best visibility of the display; to clean the touch screen, wipe the sensor (the transparent side of the front panel) with a soft cloth and some glass detergent.

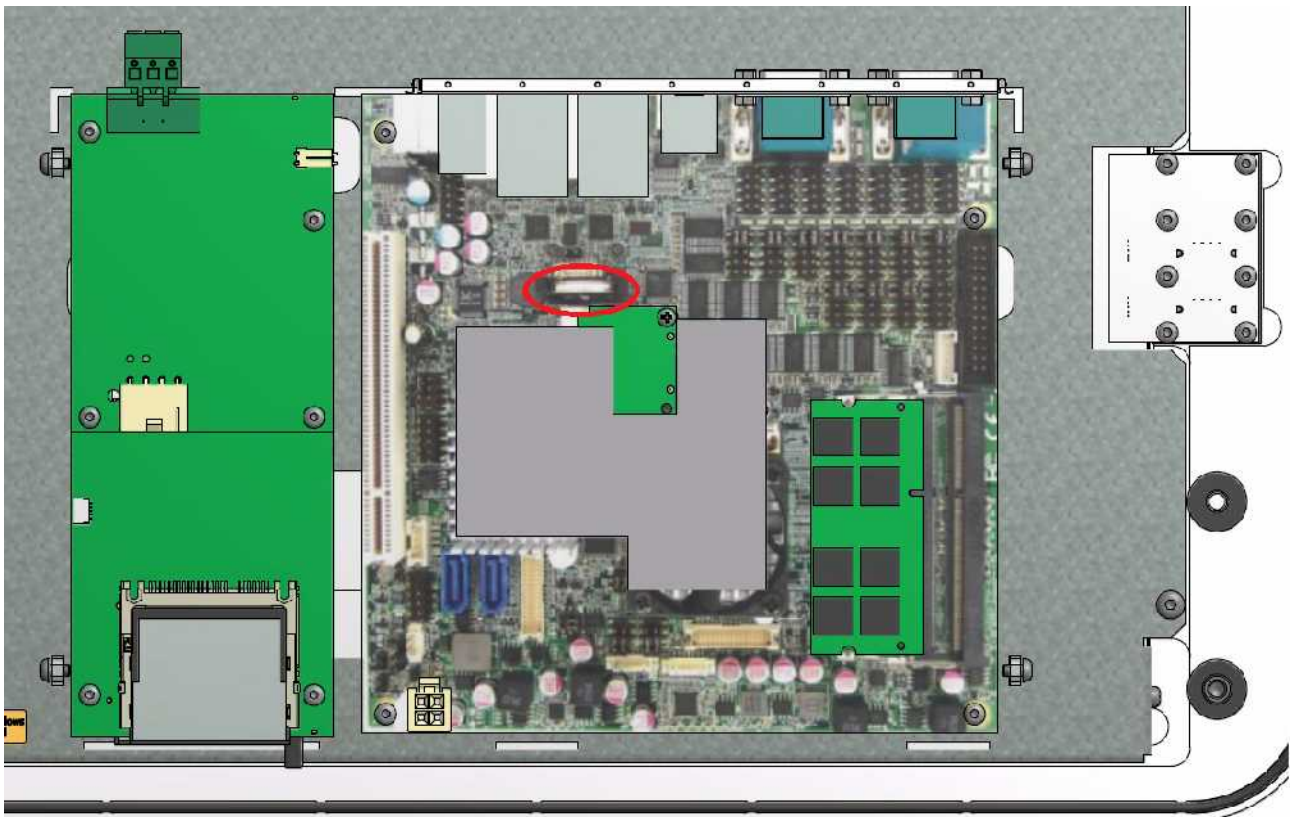
5.2 Clock battery replacement

The replacement of the clock battery is important in order to avoid losing the setting of the Cmos Setup (basic information for the computer operation).

According to the ambient temperature and to the computer use, the battery can have a different duration, starting from the *POSYC* production date.

It is recommended to replace the battery at least every two years, by always using the same model (lithium button battery – 3V – CR2032).

In order to replace the battery, switch off power, remove the computer back cover and replace the battery (indicated in red in the picture). If the battery is not completely dry, the Cmos Setup and the date/time setting will not need to be updated.



Battery position

APPENDIX A: CMOS SETUP PARAMETERS

In the *POSYC 4000*, the Cmos Setup parameters are stored in the BIOS, in order to ensure a correct operation.

Should the Cmos Setup memory be lost, for example due to the backup battery exhaustion, the parameters will be restored automatically at the *POSYC* start-up, except the date and time, which can be updated through the operating system.

Should the parameters be modified by mistake, they can be restored through the function “Optimized defaults” on the first page of the CMOS setup.

APPENDIX B: CERTIFICATIONS

DECLARATION OF CONFORMITY

SMITEC S.p.A. declares that the operator terminal **POSYC** is in conformity with the essential requirements of **DIRECTIVE 89/336 EEC and subsequent amendments**.

The Company also declares that it is in conformity with rules **EN 55022 class A, EN 61000-4-2, EN 50082-2**.



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