CMZ hardware

FCT200

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CMZ S I S T E M I
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IMPORTANT

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Use of the manual is intended as being at the user's own risk and that use of certain functions described in this manual, should be done so with due respect in order to avoid danger to people and to prevent the risk of damaging machinery.

No further warranty, therefore, is given by CMZ Sistemi Elettronici especially for any imperfections, incompleteness and/or operating difficulties.

SUMMARY

PURPOSE OF THE MANUAL

This manual describes the hardware of the FCT200 controlling system.
One can find general information on how it operates as well as its structure. All the data and specifications to be complied with for connections and start up are also made available.

NOTE
Prior to installation, the user is advised to consult the "Electromagnetic Disturbances" manual that offers some suggestions on how to connect the FCT200 with other external systems in order to reduce the disturbance effect to a minimum.

Chapter 1. THE FCT200 SYSTEM

The FCT200 system is a device for field bus control based on PowerPC technology for the management of CanOpen peripherals, the communication on 100Mbit ethernet network and on PROFIBUS, RS232 and RS485 protocols.

Just like other CMZ products, it covers the roles of axis controller, PLC, master of a distribution control network and communication with operator terminal. It, therefore, offers plenty of flexibility in usage. Furthermore, in the case of limited usage, the FCT200 system is available with a reduced number of ports to optimize the cost of its application.

Its most distinguishing features are:

CENTRAL UNIT
Motorola MPC5200 (396MHz) Microprocessor
16 Mbyte SDRAM Memory (133 Mhz)
1MByte Boot Flash EPROM
32 MByte serial Flash (programme and user data)
32 Kbyte FRAM user parameters
Real Time Clock
512 Byte I²C EEPROM (system parameters)
Temperature sensor with communication I2C

COMMUNICATION PERIPHERALS	
Complete Version	Basic Version
2 optoisolated CAN ports - DSUB9M connector	1 optoisolated CAN port - DSUB9M connector
1 optoisolated DP Profibus port - DSUB9F connector	---
1 10 /100 Mbit ethernet port - RJ45 connector	1 10 /100 Mbit ethernet port - RJ45 connector
1 SMI Serial Multiprotocol Interface (RS485 and SSI) with fast synchronization input	1 SMI Serial Multiprotocol Interface (RS485 and SSI) with fast synchronization input
1 RS232C port - DSUB9F connector	1 RS232C port - DSUB9F connector
1 SD Card drive port	1 SD Card drive port

Figure 1 and Figure 2 give a three dimensional view of the FCT200 system in the two available versions. See the chapter on MECHANICAL SPECIFICATIONS for bulky sizes and the system's mechanical specifications.
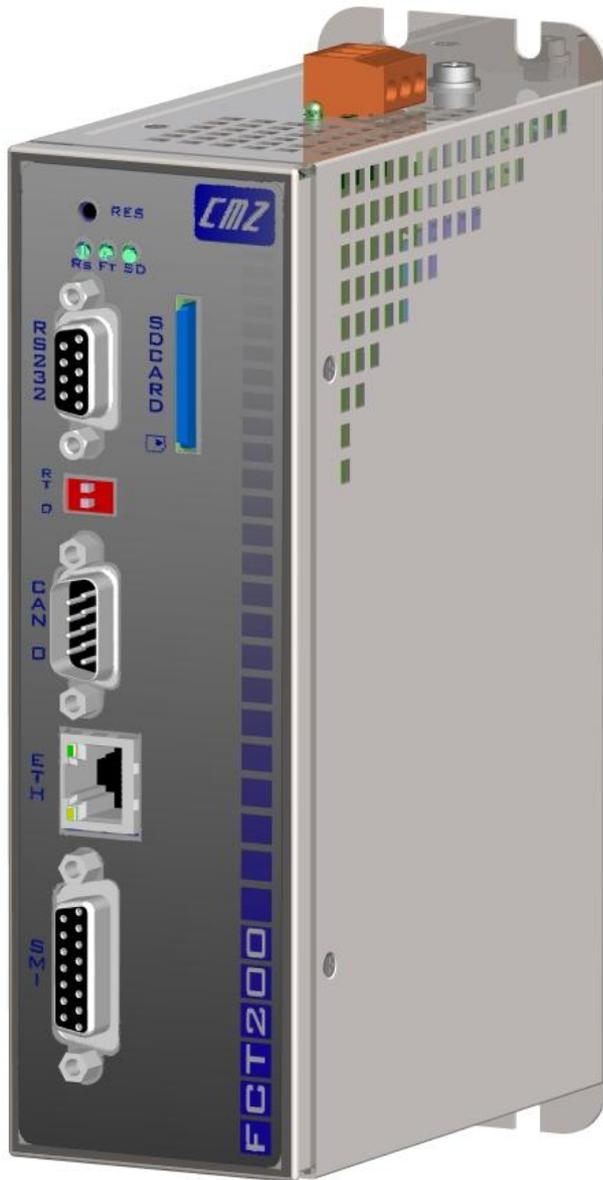
Figure 1: Mod. FCT200.0100 (Reduced version)   *Figure 2: Mod. FCT200.1100 (Complete version)*
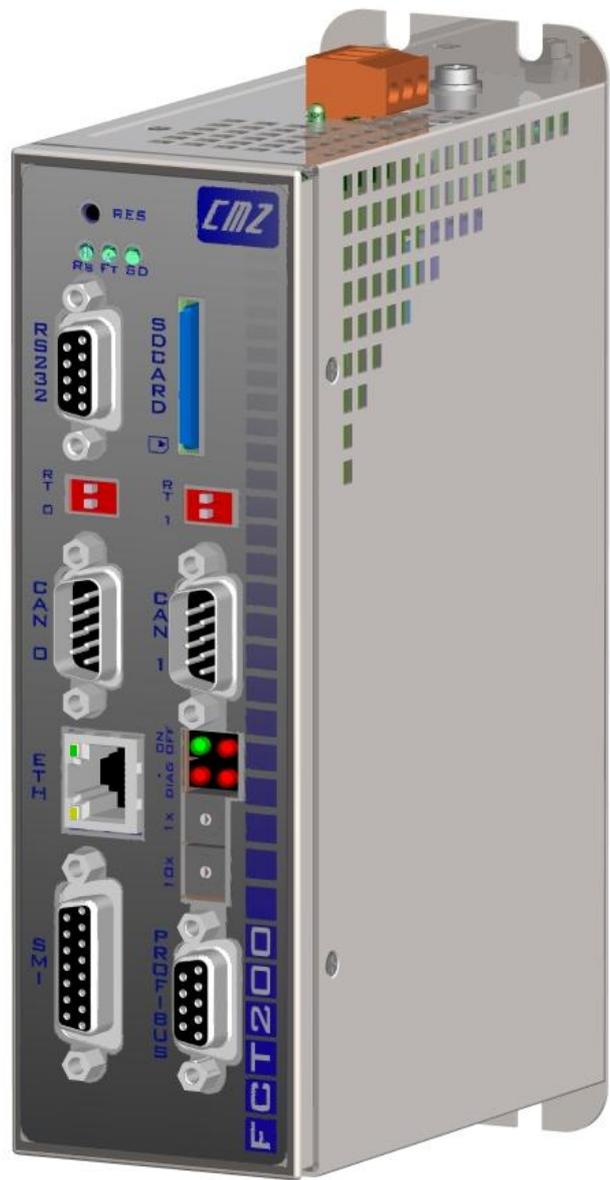
Chapter 2 CONNECTIONS

2.1 INTRODUCTION

The FCT200 system power sections and communication interfaces will be described in this chapter.

Figure 3 shows the frontal, upper and side views of the system with the resources that can be accessed:

− CAN0 communication port
− CAN1 communication port
− Resistance Dip Switch of CAN 0 and CAN1 termination ports
− 10/100 Mbit ethernet communication port
− DP Profibus communication port
− RS232 communication port
− SMI communication port
− SD Card drive interface
− Led indication
− System reset pushbutton
− SMI port Dip Switch

All these communication peripherals will be described in detail in the following paragraphs.
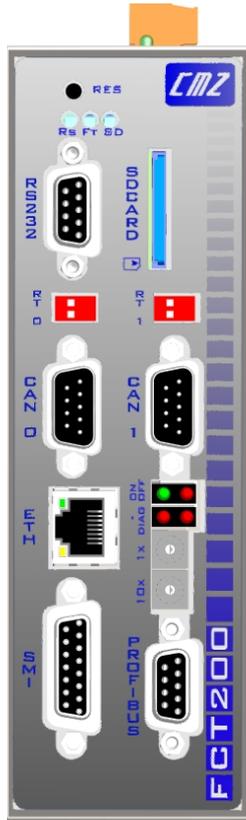
Frontal view of FCT200 system
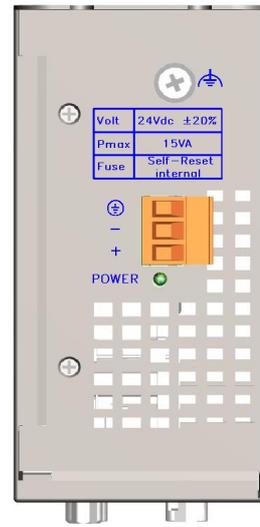
Top View of FCT200
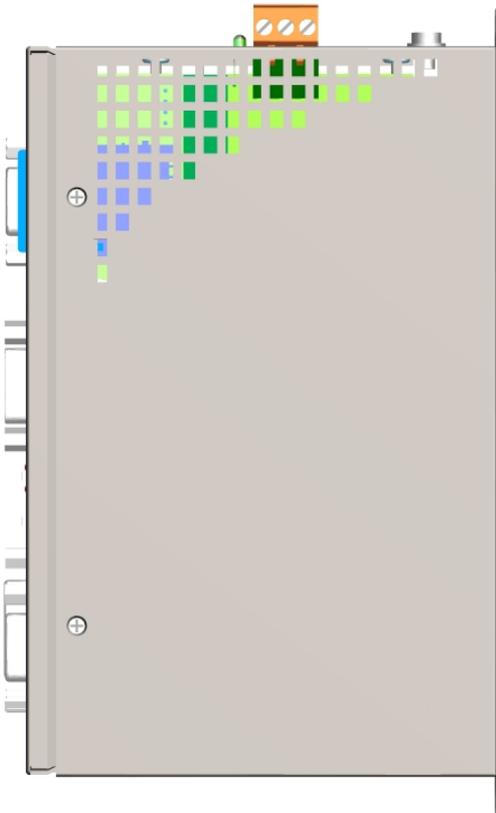
Right side view of FCT200
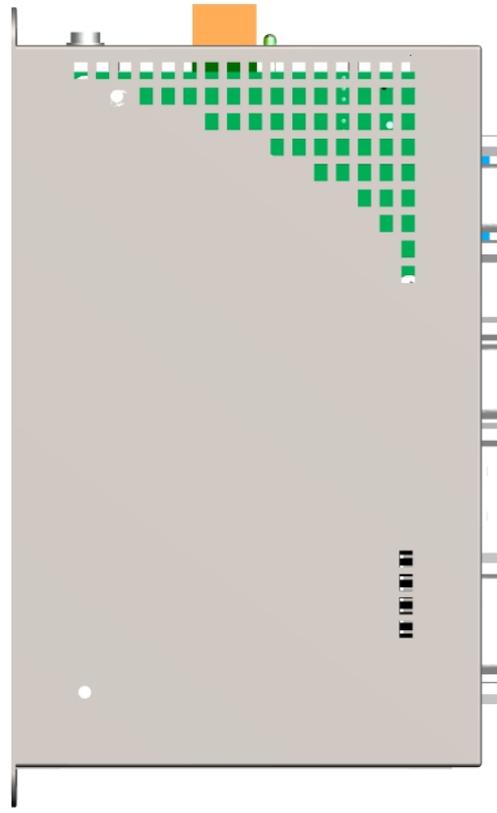
Left side view of FCT200

Figure 3 :FCT200 Views (Mod. FCT200.10)

2.2 POWER SUPPLY

2.2.1 General Information

The FCT200 system needs 24Vdc power ±20% and guarantees proper stoppage of the system via protection on a power fail level if there is a power cut.
Furthermore, the system is equipped with input power limitation at start up for a soft start stage of the machine's power sections.
The CPU logic section of the system is insulated from the machine's power section to provide better performance as regards electromagnetic disturbances.
The power connector is located on the upper side of the system and there is a green led diode that indicates the presence of voltage at the entry to the Power supply unit.

2.2.2 Technical Specifications

POWER SECTION TECHNICAL DATA	
Input voltage nominal value range	24 Vdc ± 20 %
Input current standard working value maximum standard value at start up standard duration of start up peak average standard value at start up standard duration of start up	350 mA 12 Apk 5ms 3Arms 100ms
Overall input power maximum value	15VA
Protection against short circuiting	Electronic
Primary circuit protection	Self-restoring fuse
Communication port protection	Electronic with overloading signal
Galvanic separation from 24V power	Yes
Led indicating voltage presence	Green

N.B. WARNING
A power supply unit providing enough startup current is needed to supply the system.

2.2.3 Information on installation

2.2.3.1 Description of the connector

The connection of the external power supply is done via a removable 3 pin male connector provided with the system. The pinout is shown below.

POWER CONNECTOR		
PIN	**SIGNAL**	**DESCRIPTION**
1	PE	Protection earth
2	-	0 Vdc
3	+	24 Vdc

2.2.3.2 Notes for the connection

We advise you to make the earth connection both via the power connector and via the functional earth screws (located above the connector itself), to guarantee better system performance as regards disturbances (see appendix A on SAFETY). Furthermore, this connection ensures that the entire metal covering on the FCT200 is equipotential with the system's earth protection.

FigurE 4 : Power Connection:

2.3 CAN SERIAL COMMUNICATION PORTS

2.3.1 General Points

The FCT200 system makes 2 CAN (Controller Area Network) serial communication interfaces available. If the machine's production requirements do not need both resources, the system is available in reduced version with just one CAN port.

A system's peripherals can be expanded via this field network with easier decentralisation, reduced cabling costs, considerable performance in terms of speed (up to 1 Mbit/s) and communication reliability.

The FCT200 system acts as CANopen master for this network, even if there are no drawbacks for this also becoming a (alternatively or simultaneously) SDO server of a network supervisor (e.g. a PC).

The system can communicate with other nodes both according to the CANopen protocol and other proprietary protocols subordinately to the condition that these protocols are implemented with appropriate SW libraries.

In the case of the CANopen, in particular, it is possible to create the network both with CANopen nodes produced by CMZ and with CANopen nodes available on the market.

2.3.2 Technical Specifications

The table below shows the main specifications of the serial connection.

As far as the serial connection's general specifications, the topology, the maximum number of connectable nodes, the baud rate /length ratio and the specifications of the transmissive mode are concerned, it is essential to consult the specific "CANopen peripherals Network" manual for the CANopen protocol or another manual covering the protocol used.

CAN SERIAL CONNECTION SPECIFICATIONS	
Protocol	CAN (ISO-11898 Ver. 2.0 Part B)
Accepted Baud Rates	50,125,250,500,800,1000 Kbit
Galvanic insulation	YES
Termination resistance	Can be inserted using RT dip switch

2.3.3 Information on installation

2.3.3.1 Description of connectors

CAN (DSUB 9 PIN MALE) CONNECTOR		
PIN	SIGNAL	DESCRIPTION
1	-	-
2	CAN_L	CAN low
3	CAN _GND	CAN ground
4	-	-
5	CAN_SHLD	CAN shield
6	CAN_GND	CAN ground
7	CAN_ H	CAN high
8	-	-
9	-	-
N.B. The pinout is valid for both the CAN0 and CAN1 ports.		

2.3.3.2 Notes for the connection

Information on the creation of this kind of network can be found in the specific "CANopen peripheral network" manual

2.3.3.3 Termination resistance

Alongside the DSUB connectors can be found RT0 (for the CAN0 port) and RT1(for the CAN1 port) termination resistance insertion commutators.
As regards the RT0 dip switch, if the two switches are turned to the ON position, the resistance is active while if they are both turned to the OFF position, the resistance is deactivated. Standard supply of the system is with the resistance active. The same applies to the RT1 commutator.

2.4 10/100 ETHERNET serial communication port

2.4.1 General Information

The FCT200 system has a 10/100Mbit ETHERNET communication interface that acts as communication interface with the network. See the relative software manuals for a description of the communication protocol.

ETHERNET SECTION SPECIFICATIONS	
Baud Rate	10/100 Mbit/s
Communication protocol	IEEE 802.3 CSMA/CD
Network interface	10/100 BASE-T Twisted Pair
Network connector	RJ –45
Self-negotiation	Yes, Auto-MDIX for 10/100 Mb/s
Galvanic insulation	Via Pulse Transformer

2.4.2 Diagnostic function of the LEDs

The RJ45 connector of the ETHERNET section integrates 2 led diodes with the following diagnostic function:
- Green LED: active if it has a valid link to another ethernet port (e.g. Terminal, Hub, etc.)
- Yellow LED: indicates the presence of traffic on the network

2.4.3 Setting the IP address

Before being able to communicate on the ethernet network, in particular on the TCP/IP protocol, it is essential to set the FCT200 system's IP address.
This address relies on the network where the system is installed and it is the user's responsibility to set the correct value.
The tools for setting this address can be found in the software packet distributed by CMZ Sistemi Elettronici. For further information see the software manuals and if necessary contact the support office.

2.4.4 Information on installation

2.4.4.1 Description of connectors

CONNETTORE ETHERNET (RJ45)			
PIN	SEGNALE	DESCRIZIONE	
1	TD+	Transmit data +	
2	TD-	Transmit data -	
3	RD+	Receive data +	
4	-	-	
5	-	-	
6	RD-	Receive data -	
7	-	-	
8	-	-	
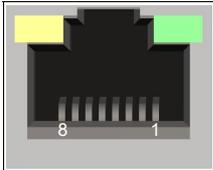
2.4.4.2 Connection Cables

We suggest you use a cat. 5 or greater STP shielded cable with termination connectors for the connection, as shown in Figure 5. These connectors guarantee a solid connection of the shield compared to die-cast patch cables which we **do not recommend.**
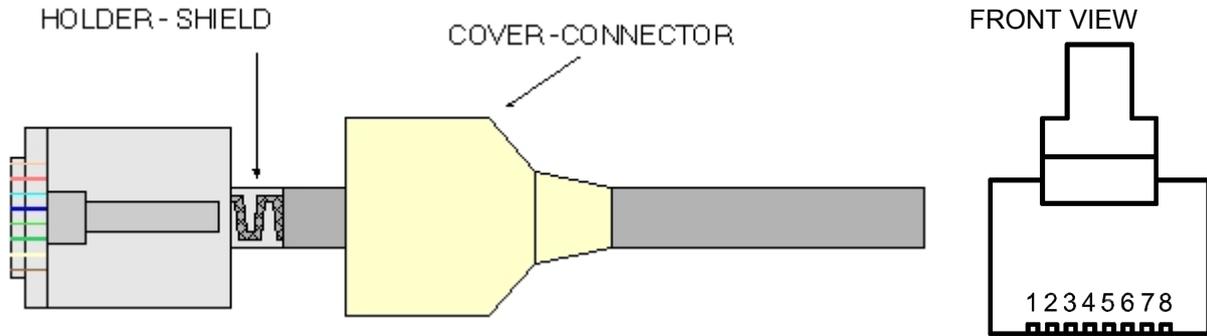
Figure 5: RJ45 Connector with shield blocking collar

100Mbit ETHERNET CABLE SPECIFICATIONS	
Number of pairs	4
Production	Twisted pairs
Shielding	Metal tape
Single pair shielding	Optional (recommended)
Characteristic Impedence Z_0	100 Ω

Contact CMZ Sistemi Elettronici's support office for technical information on where to find these connectors.

2.5 RS232 SERIAL COMMUNICATION PORTS

2.5.1 General Information

The FCT200 system provides 1 RS232 serial communication port to act as communication interface with other intelligent units. The port is optoisolated from the 24V power but is not optoisolated from the processor.

2.5.2 Information on installation

2.5.3 Description of connectors

RS232 CONNECTOR (DSUB) RS2 CONNECTOR			
	SIGNAL	DESCRIPTION	Type
1	DCD	Data carrier detect	Input
2	TXD	Transmit data	Output
3	RXD	Receive data	Input
4	-	-	
5	SGND	Signal ground	Output
6	VCC	Power supply +5 Vdc	Output
7	CTS	Clear to send	Input
8	RTS	Request to send	Output
9	-	-	

2.5.4 Notes for the connection

 Figure 6: RS232 Connection between FCT200 and other units describes the serial connection cables in minimum configuration towards a PC host. The maximum data rate is equal to 230400 baud, for a permitted cable length of 10m.
It is advisable to use a shielded cable (mod. 8104 BELDEN ELECTRONICS), whose shield must be connected to the DSUB connector casing on both sides of the cable.

IMPORTANT
In the event that the difference between the FCT200's potential reference (PE protection earth) and the potential reference of the connected system (e.g. a PC) is not zero, then it is essential for the serial cable shield to be connected only to the FCT200 connector.
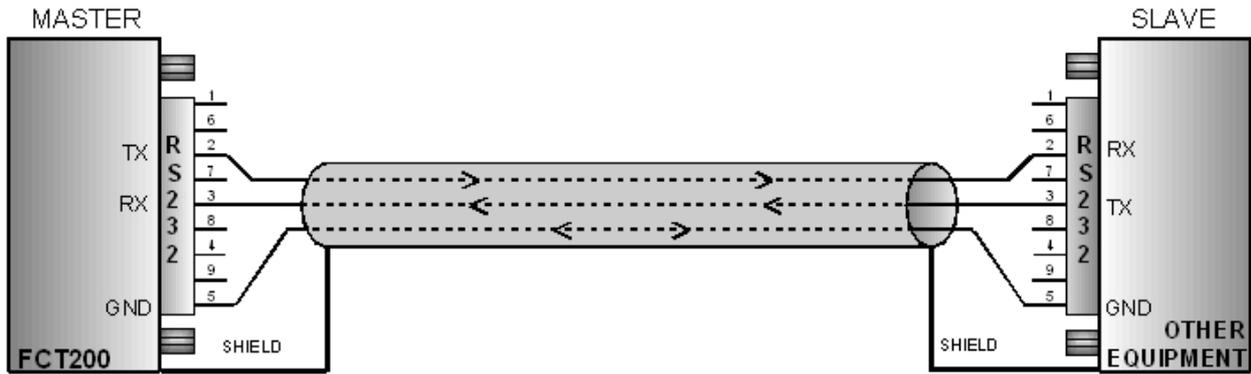
Figure 6: RS232 Connection between FCT200 and other units

2.5.5 Technical Specifications

COMMUNICATION PARAMETERS	
PARAMETER	**VALUES**
Baudrate	1200 to 230400 bps
DataBits	5 ÷ 8
StopBits	1 or 2
Parity	None, Odd, Even, Space, Mark

2.5.6 ADP422 and ADP485 Adaptors

CMZ provides specific level adaptors for the RS485 or RS422 network connection; these adaptors are a cheap, compact option for converting the serial channel signals from RS232 to RS422/485, thus expanding the system's capacity. Power is supplied by the system's RS232 port itself and is protected against short-circuiting. The most detailed description of these adaptors and their mechanical sizes can be found in the "Accessories and interface cards" manual.

2.6 Serial multi protocol INTERFACE - SMI

2.6.1 General Points

The FCT200 system has a serial communication interface capable of configurating itself as asynchronous communication port like RS485-RS422 or synchronous for SSI protocols. Furthermore, there is an input available to capture a fast external signal in single ended or line driver (differential) mode. The port configuration is done by setting the dip switches located on the side of the system and software settings (see product software manuals for the latter, checking whether the services have been implemented)

2.6.2 Information on installation

ASYNCHRONOUS COMMUNICATION	
PARAMETER	**VALUES**
Baudrate	1200 to 187500 bps
DataBits	5 to 8 bits
StopBits	1 or 2
Parity	None, Odd, Even, Space, Mark

FAST INPUT	
PARAMETER	**VALUES**
Type	Line Driver, single ended
Maximum input voltage (single ended)	30V
HIGH input voltage (single ended)	11V
HIGH input power (single ended)	15mA min
LOW input voltage (single ended)	5 V
LOW input power (single ended)	1,5mA max
Commutation threshold (Line driver)	± 200 mV max
Hysteresis (Line driver)	70mV typ.
Delay on upward or downward front	2 µS MAX
Commutation frequency	300 Khz MAX
Polarity inversion protection	SI

SYNCHRONOUS COMMUNICATION	
PARAMETER	**VALUES**
Baudrate	2 Mbaud Max
Type	Line driver

2.6.3 Description of connectors

SMI (DSUB 15 PIN FEMALE) CONNECTOR		
PIN	**SIGNAL**	**DESCRIPTION**
13	TX+/SSI_MO+	TX+ for RS485 – RS422 SSI_MO+ master output for SSI communication
6	TX-/SSI_MO-	TX- for RS485 – RS422 SSI_MO- master output for SSI communication
12	RX+/SSI_SO+	RX+ for RS485 – RS422 SSI_SO+ slave input for SSI communication
5	RX-/SSI_SO-	RX- for RS485 – RS422 SSI_SO- slave input for SSI communication
7	SSI_SCLK+	SSI_SCLK+ clock output for SSI communication
14	SSI_SCLK-	SSI_SCLK- clock output for SSI communication
4	SERIAL_GND	Serial communication ground port
11	SERIAL_GND	Serial communication ground port
8	DRIVE_INT+	Positive fast input - LINE DRIVER type
15	DRIVE_INT-	Negative fast input - LINE DRIVER type
10	FAST_INPUT	24V Fast Input
3	INPUT_GND	Fast ground input
1	+VCC_EXT	Power for 6V 200mA max auxiliary devices. Can only be used with CMZ systems
9	GND_EXT	Ground power for auxiliary devices. Can only be used with CMZ systems
2	N.C.	Non used - do not connect

2.6.4 Configuration Dip Switch

There are dip switches located on the side of the system for the configuration of the SMI port. In order to access them, use a fine pointed tool.

DIP-SWITCH SETTING		
DIP SWITCH N°	**SIGNAL**	**DESCRIPTION**
1	RTER RX RTER SSI_SO	Insertion of termination resistance 150Ω receiving channel
2	RTER TX RTER	Insertion of termination resistance 150Ω transmission channel
3	R_{PullUp} RX+ R_{PullUp} SSI_SO+	Insertion of 470 ohm positive polarisation resistance on the receiving channel
4	$R_{PullDown}$ RX- $R_{PullDown}$ SSI_SO-	Insertion of 470 ohm negative polarisation resistance on the receiving channel
5	R_{PullUp} TX+ R_{PullUp} SSI_MO+	Insertion of 470 ohm positive polarisation resistance on the transmission channel
6	$R_{PullDown}$ TX- $R_{PullDown}$ SSI_MO-	Insertion of 470 ohm negative polarisation resistance on the transmission channel
7	Fast input Single Ended	Fast line insertion single ended mode
8	Fast input RTER Line Drive	Insertion of termination resistance 150Ω receiving channel line driver fast input
The system is delivered with all the dip switches in the OFF position		
NB: The description of the possible dip switch settings is shown below with the applicative cards of the various cases		

2.6.5 Notes for the connection

It is advisable to use a shielded cable (mod. 8104 - 4 pairs or mod. 8132-2 BELDEN ELECTRONICS pairs), whose shield must be connected to the DSUB connector casing on both sides of the cable.

> **IMPORTANT**
> In the event that the difference between the FCT200's potential reference (PE protection earth) and the potential reference of the connected system (e.g. a PC) is not zero, then it is essential for the serial cable shield to be connected only to the FCT200 connector.

The various cases that can be presented with the description of the connections and dip switch settings are shown below

N.B. : The serial dip switch setting has no relevance on the dip switches regarding the fast input and vice versa.

2.6.5.1 RS485 Point to Point or Initial Multipoint Node Configuration
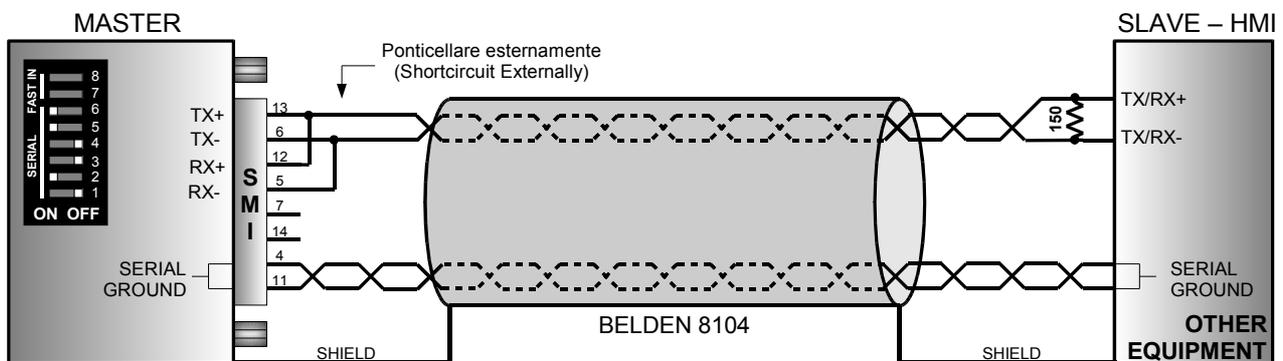
2.6.5.2 RS485 Intermediate Multipoint Node Configuration
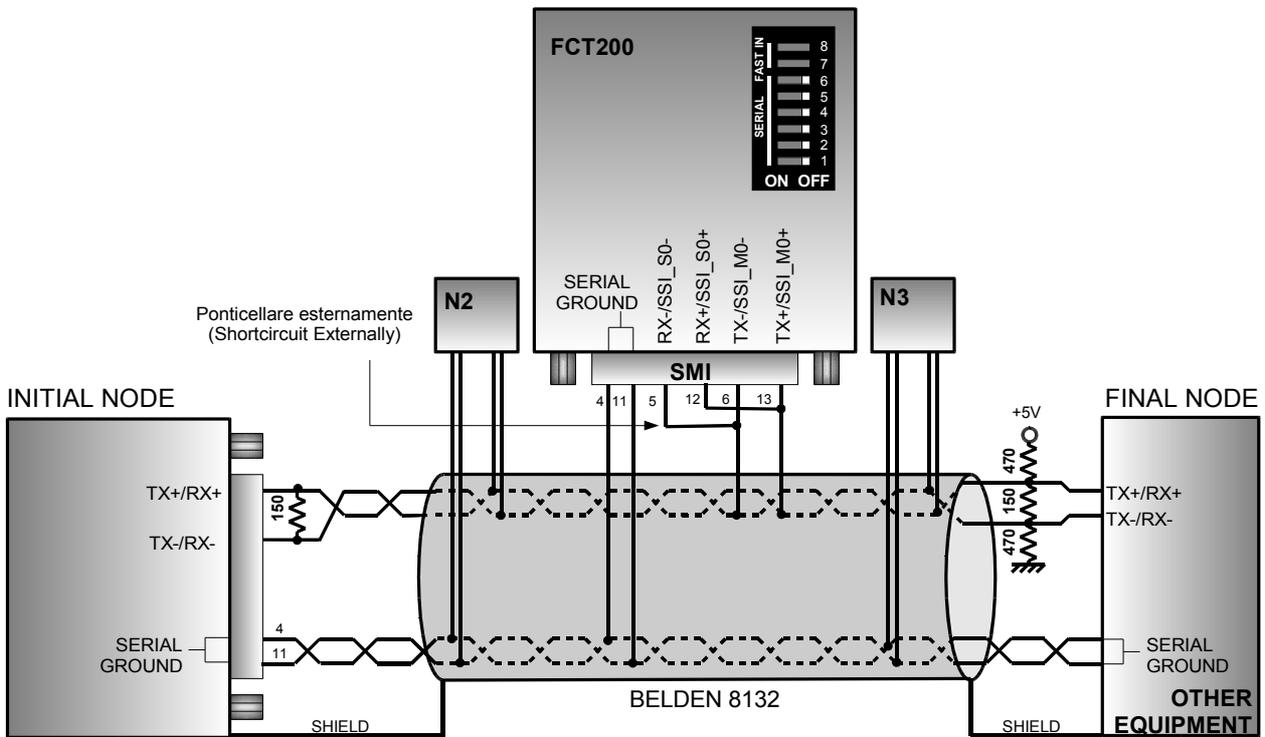
Note: The 470 ohm polarisation resistances can be avoided if those integrated in the FCT200 controller (DIP SWITCH 5 and 6 ON) are used.

2.6.5.3 RS422 Point to Point Configuration
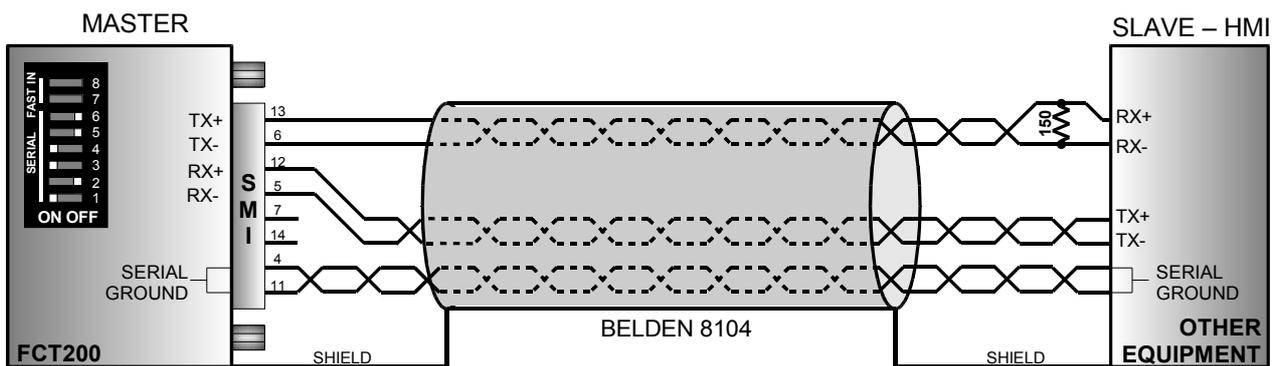
2.6.5.4 RS422 MASTER Intermediate Multipoint Node Configuration
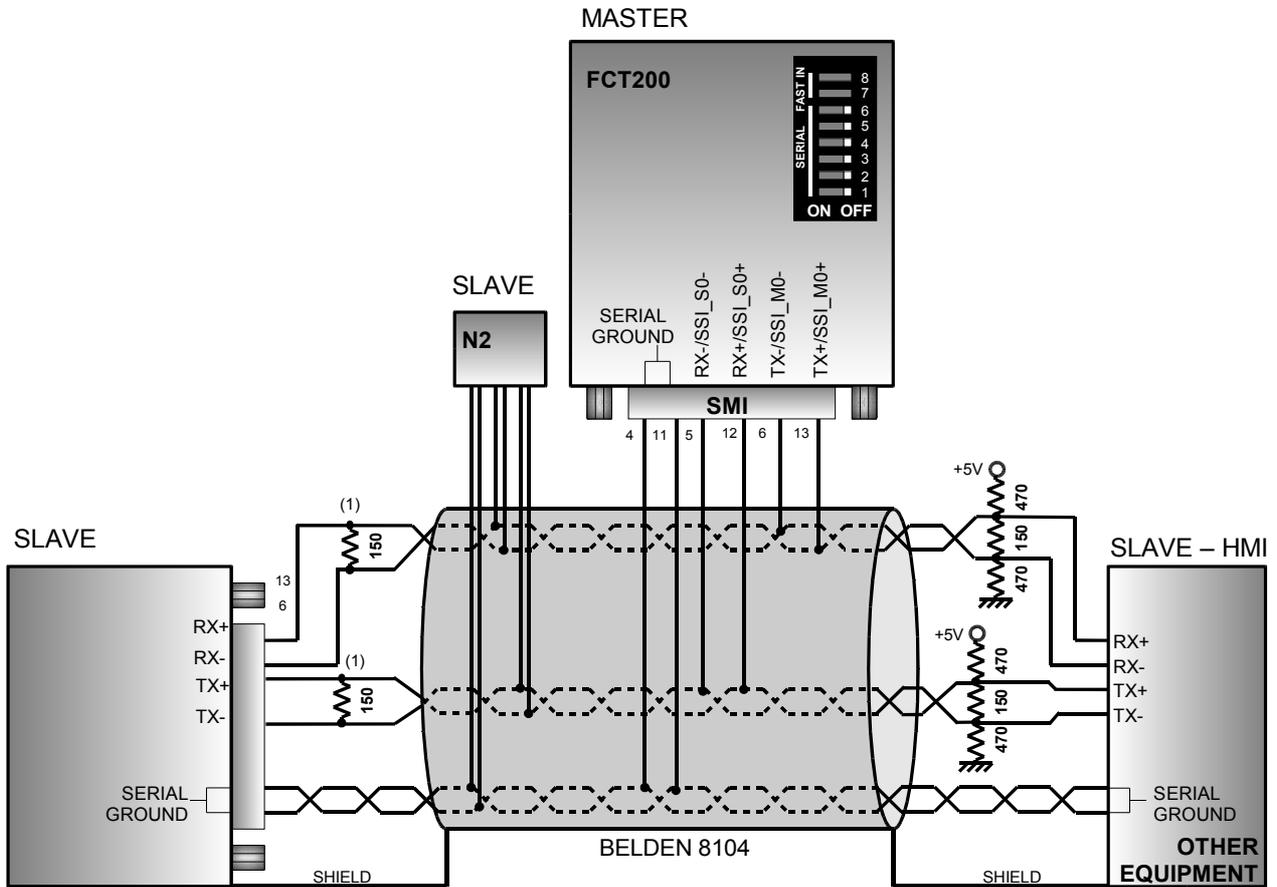
Note: The 470 ohm polarisation resistances can be avoided if those integrated in the FCT200 controller (DIP SWITCH 3-4-5-6 ON) are used.

Note (1) : Optionals for cable lengths over 10m.

## 2.6.5.5 RS422 SLAVE Intermediate Multipoint Node Configuration
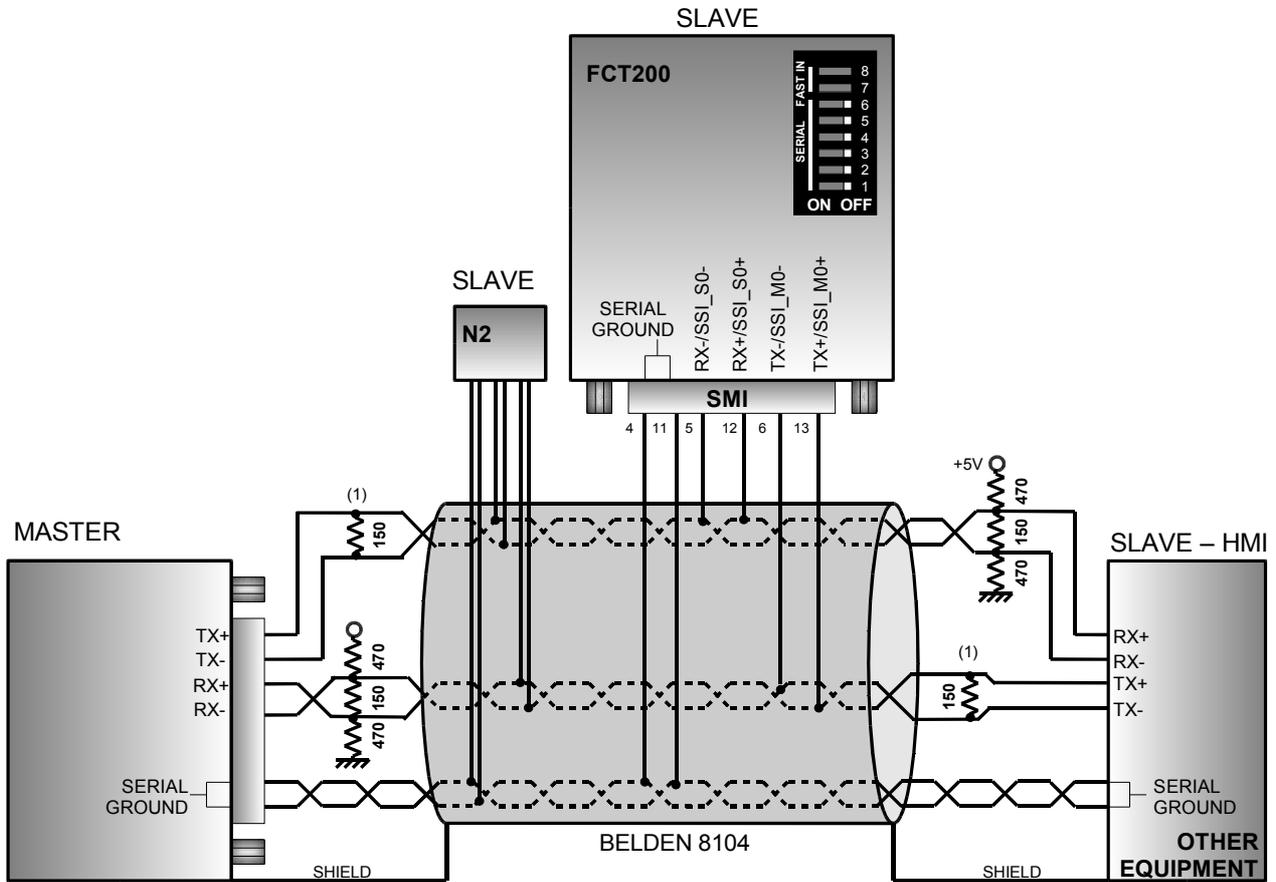
Note: The 470 ohm polarisation resistances can be avoided if those integrated in the FCT200 controller (DIP SWITCH 3-4-5-6 ON) are used.

Note (1) : Optionals for cable lengths over 10m.

2.6.5.6 Fast Configuration - Input Single Ended
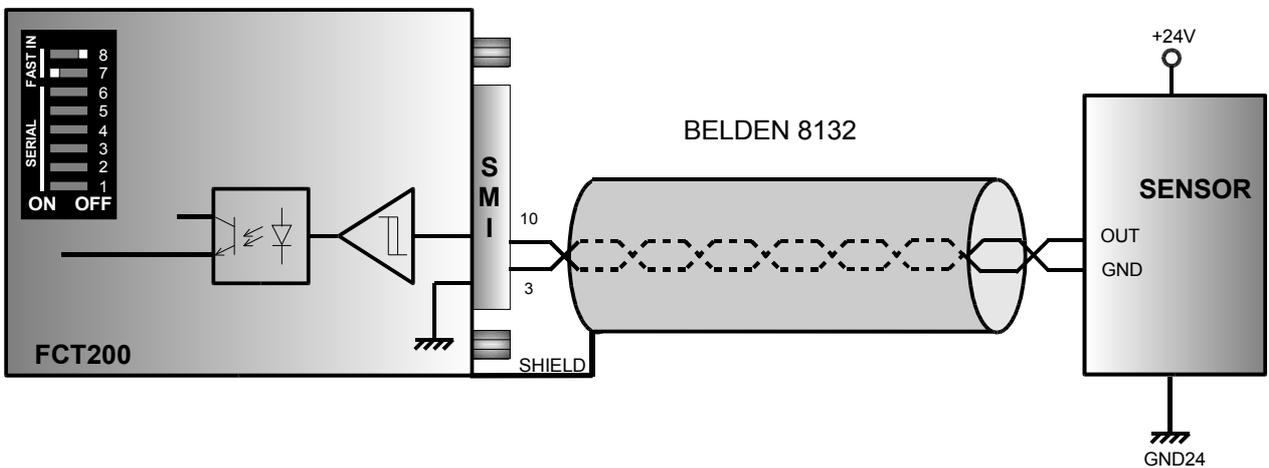
2.6.5.7 Fast Input Line Driver Configuration
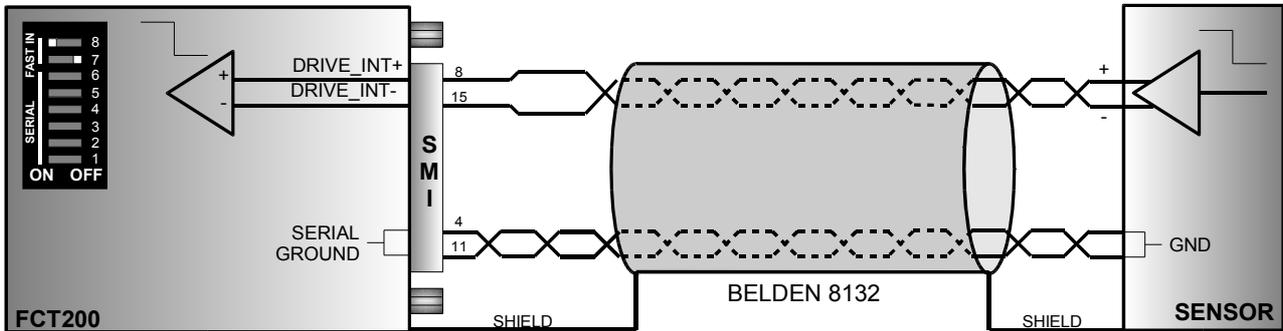
2.6.5.8 SSI MASTER Configuration - Synchronous Serial
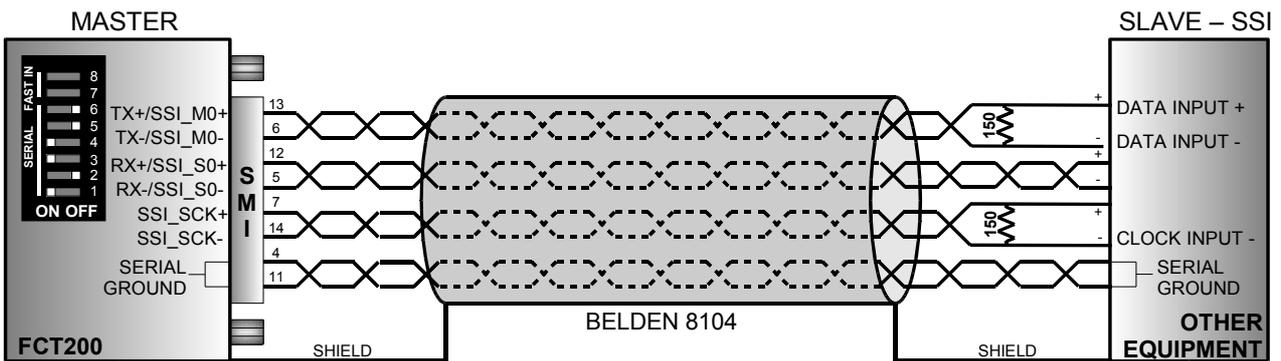
2.6.5.9 SSI MASTER Configuration – LOCAL IO

2.7 PROFIBUS-DP SERIAL COMMUNICATION PORT

2.7.1 General Information

The interface for the PROFIBUS SLAVE communication towards PLC and other peripherals conforming to the Profibus-DP EN 50170 (DIN 19245) standard is available on the front panel.

2.7.2 Technical Specifications

The communication speed on the Profibus-DP network is self-selected (via software) from among 9 different values, from a minimum of 9.6 Kbaud to a maximum of 12 Mbaud, linking itself onto the network speed.

MAIN SPECIFICATIONS OF THE TRANSMISSIVE AND CONNECTION MEANS	
Connection	RS485
Galvanic insulation	With opto-coupler
Support	Shielded cable with twisted pairs
Shielding	Mixed: film and shield
Number of pairs	1
Zo characteristic Impedance	150 Ω
Network termination	220 Ω -390 Ω -390 Ω on external connector
Recommended models	3079A BELDEN ELECTRONICS

2.7.3 Information on installation

2.7.3.1 Description of connectors

CONNETTORE PROFIBUS-DP (DSUB 9 PIN FEMMINA)		
PIN	SIGNAL	DESCRIPTION
Casing	SHLD	Connected to PE
1	-	-
2	-	-
3	BUS_H (B)	Signal high (positive)
4	RTS	Request to send
5	SGND	Signal ground
6	+VCC (Vp)	+5 Vdc
7	-	-
8	BUS_L (A)	Signal low (negative)
9	-	-

2.7.3.2 Notes for the connection

The following specifications must be respected when creating this kind of network:

- The units on the network must be connected in cascade topology, avoiding absolutely star and/or derivation connections. Furthermore, if the system occupies an intermediate position within the network, the derivation must be externally cabled to the connector, otherwise the transmission

could be unreliable (see Figure 7).
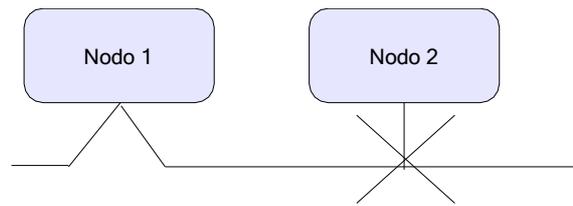
Figure 7: Detail of the correct connection between systems with Profibus-DP.

• Use the same kind of cable for the entire installation.

• The BUS-H and BUS_L pins must be connected to the same twisted pair (see Figure 8); the cable shield should be connected to the connector chassis.
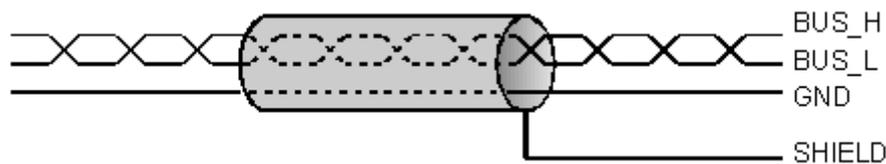

Figure 8: Cable connection for Profibus-DP

• We recommend you use specific connectors for the Profibus network when connecting the cables. (e.g. PHOENIX. CONTACT mod.2744377 or mod.2744348) where the termination resistances are integrated directly into the connector.
• Insert the termination resistances in the systems located at the beginning and end of the line.

2.7.3.3 Node Address Settings

In order to allow networks addressing, each node on the network must be assigned to a distinct number. In the FCT200 system this number is assigned using two rotating switches that allow for a number from 1 to 99 in decimal format to be set.
The switch marked with "x1" is used to set the units, and the one marked with "x10" for the tens. For example, in order to configure the system with the address "49", the tens switch should be set at "4" and the units one at "9".
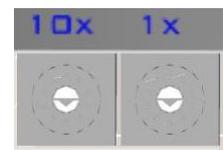
IMPORTANT
– **The number "00" is reserved to allow for numbering via software**
– **The address cannot be changed during operational mode.**

2.7.3.4 Description of the LEDs

There are 4 LEDs on the front panel that indicate the state of the Profibus.DP communication port according to the reference standard.
Alongside is the position of the leds on the front part of the system while the table below explains what they mean.

LED			
LED	**NAME**	**COLOUR**	**DESCRIZIONE**
1	Not used	-	Not used
2	On-line	Green	**On**- Indicates that the module is On-line in the Fieldbus **Off**- Indicates that the module is not On-line
3	Off-line	Red	**On**- Indicates that the module is Off-line in the Fieldbus **Off**- Indicates that the module is Off-line
4	Fieldbus diagnostics	Red	Indicates different status of the Fieldbus: **Flashing 1 Hz**- Configuration fault: the length of the IN and/or OUT set during the initialisation of the module is not the same as that set during the network configuration. **Flashing 2 Hz**- Fault in the User Parameter data: the length/content of the User Parameter given during the initialisation of the module is not the same as that set during the network configuration. **Flashing 4 Hz**- Fault in the initialisation of the ASIC Profibus communications. **No flashing**- No diagnostic found

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Chapter 3 SD CARD

The FCT200 system includes an interface for SD card memory cards visible in the controller filesystem. The SD Card port permits different functions including the memorisation of mass data and automatic updating of both the system's firmware and software.
The port is protected against SD chart short-circuiting thanks to the electronic limitation of power supply that appears on the led fault indicating a problem.

The following table shows the SD Card's main specifications used in the system.

TECHNICAL INFORMATION	
Model	SD CARD
Power voltage:	3,3 Vdc
Short-circuiting protection	Electronic limitation of the 400mA power supply
Memory type	not volatile
Standard	SPI - SD Card Specification Ver.1.01
LED indicators	SD - FT

See paragraph "Significance of LED status" to understand the meaning of the SD led indicators".
The connector for the insertion of the SD card is the push pull type, so in order to release the card you have to push the card inwards in order to take it out, see Figure 9
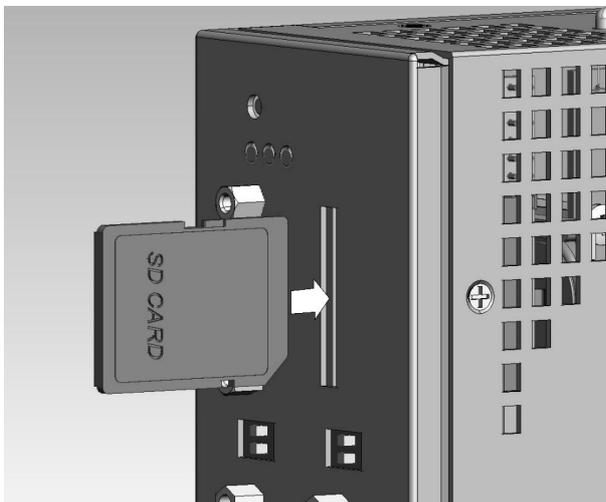

Figure 9: Insertion of SD memory Card

Chapter 4 Meaning of the LED status - Reset Pushbutton

4.1 Description of LED status

The three status LEDs on the system's front panel provide information on the status of the system useful to the user. Their meanings are shown in the table below.

STATUS LED Rs - RESET	
STATUS	DESCRIPTION
Off	System off, check the power supply (see 2.2)
Orange - fixed	System at start-up stage
Red	Indicates pressure on the reset button for a period greater than two seconds
Green	Normal operation
Green->Orange	System reset for internal watch dog
Green->Orange with RES button pressed	Re-start up of the system for reset pushbutton

STATUS LED Ft - FAULT	
STATUS	DESCRIPTION
Off	System properly started with no alarms
Orange - fixed	System in Debugging mode
Red - fixed	System software update in progress
1 flashing/second	Absence at start up of the system of self-booting SoftPLC software memorised in the Filesystem.
2 flashings/second	Internal RTC Clock not set or buffer battery flat.
3 flashings/second	HW initialisation fault (Ethernet and other)
4 flashings/second	Temperature reading inside the system > 60 degrees
5 flashings/second	HW card option fault
6 flashings/second	Reserved
> 6	Reserved
Note: the presence of several alarms is indicated sequentially with an interval of three seconds between each one.	

LED DI STATO SD – Secure Digital Card	
STATUS	**DESCRIPTION**
Red flashing	The system is reading or writing on the memory card
ORANGE flashing	memory card power supply overload. Remove the device

4.2 RESET Pushbutton

Beside the led indicators there is a system reset pushbutton that can be accessed via a pointed tool.
By pressing this button, the system is completely restarted.
The pushbutton is also used in other functions that can be referred to in the software manuals.

Chapter 5 RTC Buffer Battery

The FCT200 system is provided of a system clock powered by a buffer battery to manage the various software applications that can be implemented
The buffer battery is located inside the system so in order to replace it, the lid must be removed. The battery's specifications are as follows:

BATTERY SECTION SPECIFICATIONS	
Battery type	Lithium
Battery Model	Standard CR2032
Nominal voltage	3V
Typical capacity	Minimum 200 mAh
Absorption	2 uA
Recommended model	VARTA mod. 6032 101 501

WARNING	
	THERE ARE PARTS INSIDE THE BATTERY COMPARTMENT THAT ARE SUSCEPTIBLE TO ELECTROSTATIC DISCHARGES. **BEFORE OPENING THE COVER, MAKE SURE THAT YOU ARE NOT ELECTROSTATICALLY CHARGED. ALL YOU NEED TO DO IS TOUCH AN EARTHED METAL PART.**

5.1 Battery replacement procedure

In order to replace the buffer battery, follow the steps shown in the figure below:

–   Turn the system off, disconnect the cables, remove the system from the panel and take it to the workbench
–   Make sure you are electrostatically discharged. All you need to do is touch an earthed metal part.
–   Unscrew the eight tightening screws on the lid and the operational earth screw (Figure 10)
–   Take out the lid as shown in   Figure 11 paying attention with the power connector
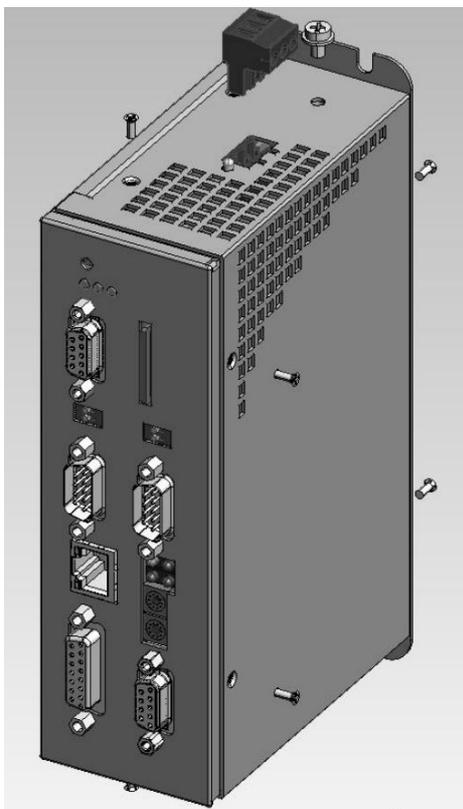
*Figure 10: Dismantle FCT200 tightening screws on lid*
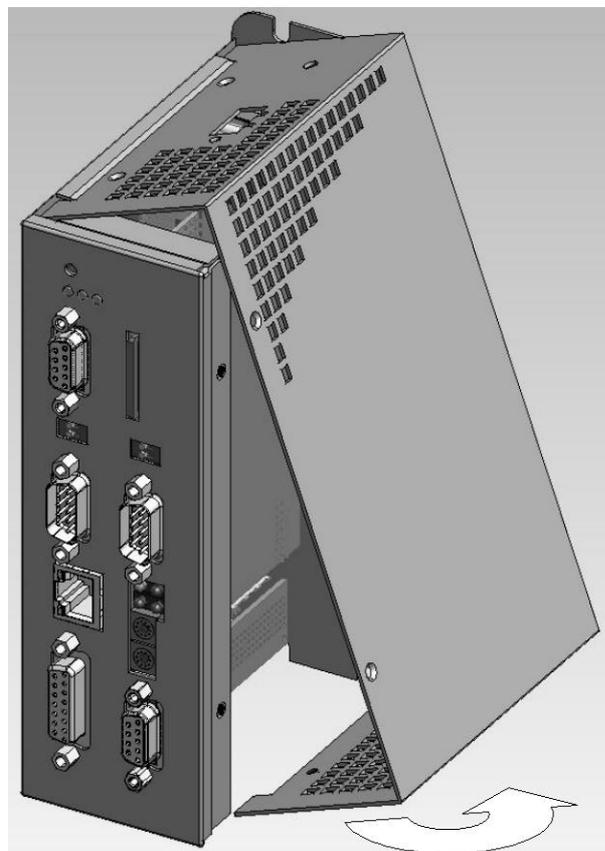
Figure 11: Lid opening

–   beside the power supply card you can see the CR2032 buffer battery (Figure 12)
–   using pliers, remove the battery by rotating it anticlockwise and pulling it upwards as shown in Figure : 13 . The pliers will short-circuit the battery and as a result the battery cannot be used after this operation.
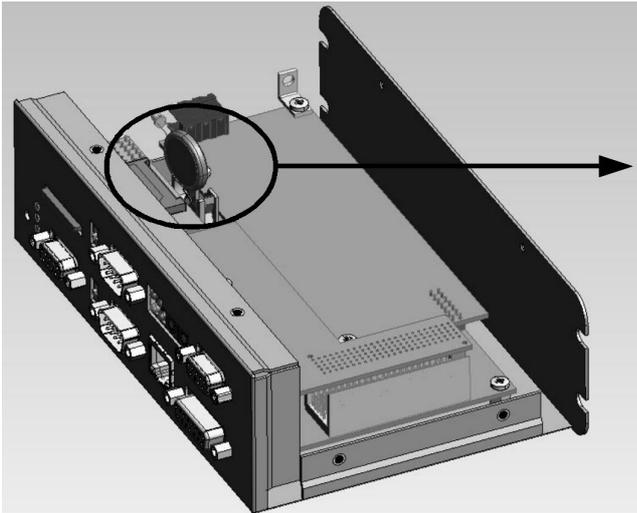
Figure 12 : Buffer Battery Position   **Figure : 13 Removal of buffer battery**
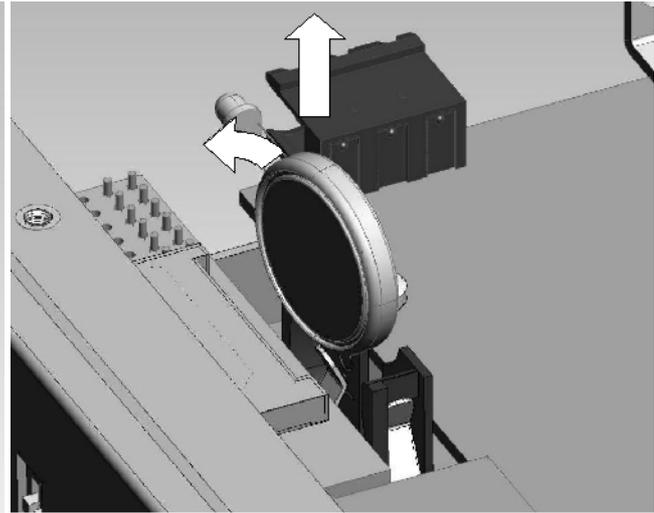
– at this stage, put in a new CR2032 buffer battery by inserting it into the battery holder from the top (do not use pliers)
  WARNING : The battery is not protected against polarity inversion so pay particular attention to the polarity when inserting it.
– fit the lid on by firstly resting the side of the lid on the power connector part, in reverse order to when it was removed.
– screw the eight screws back onto the lid and the operational earth screw
– turn the system on and check that it is working properly (see led indicator status and software system monitor)
– eset the date and time on the system
– if you encounter any problems, contact CMZ Sistemi Elettronici's support office.

Chapter 6 MECHANICAL SPECIFICATIONS

The FCT200 system's mechanical sizes are indicated in Figure 14 end Figure 15. All measurements are expressed in mm.
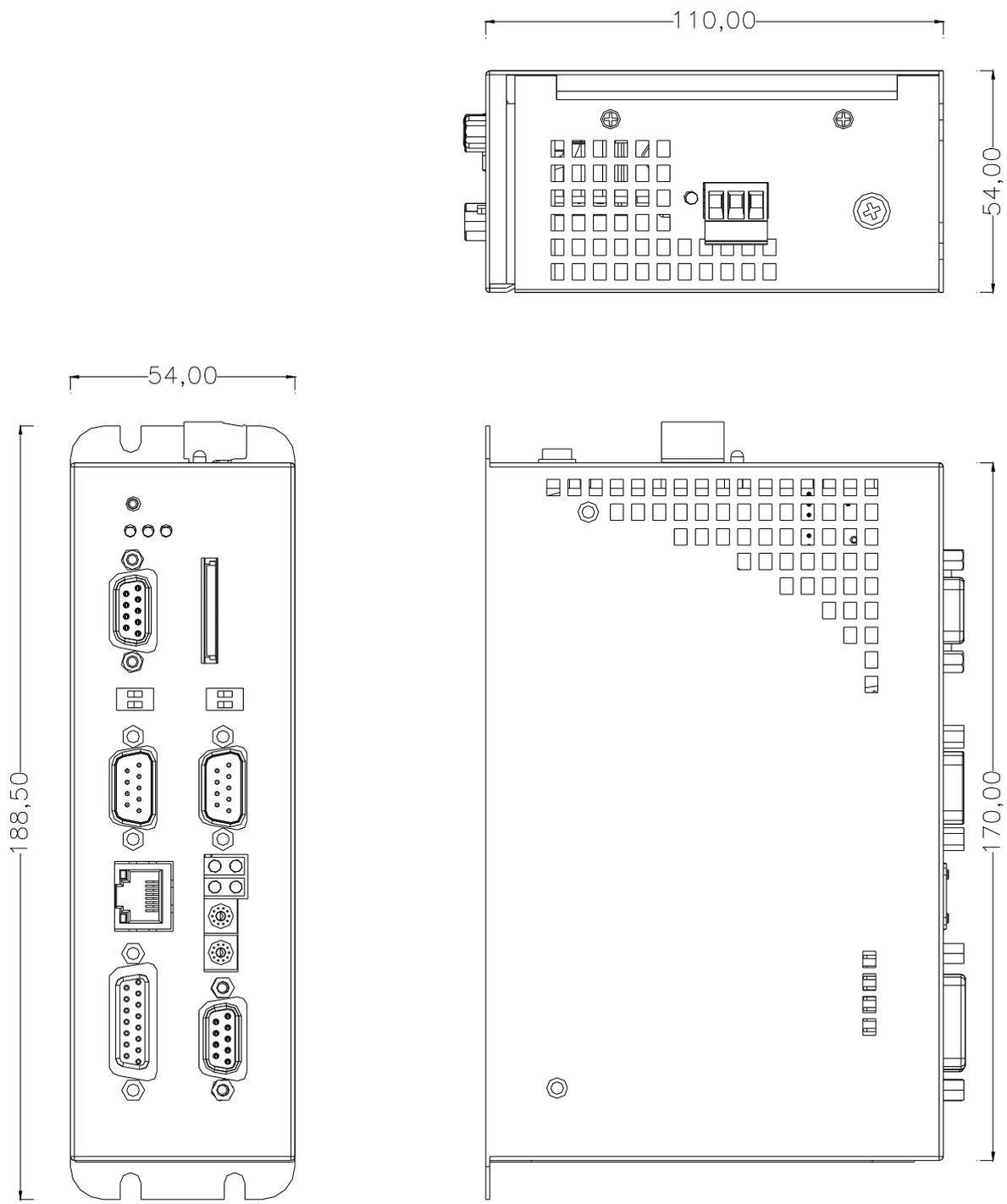
Figure 14 : System bulk
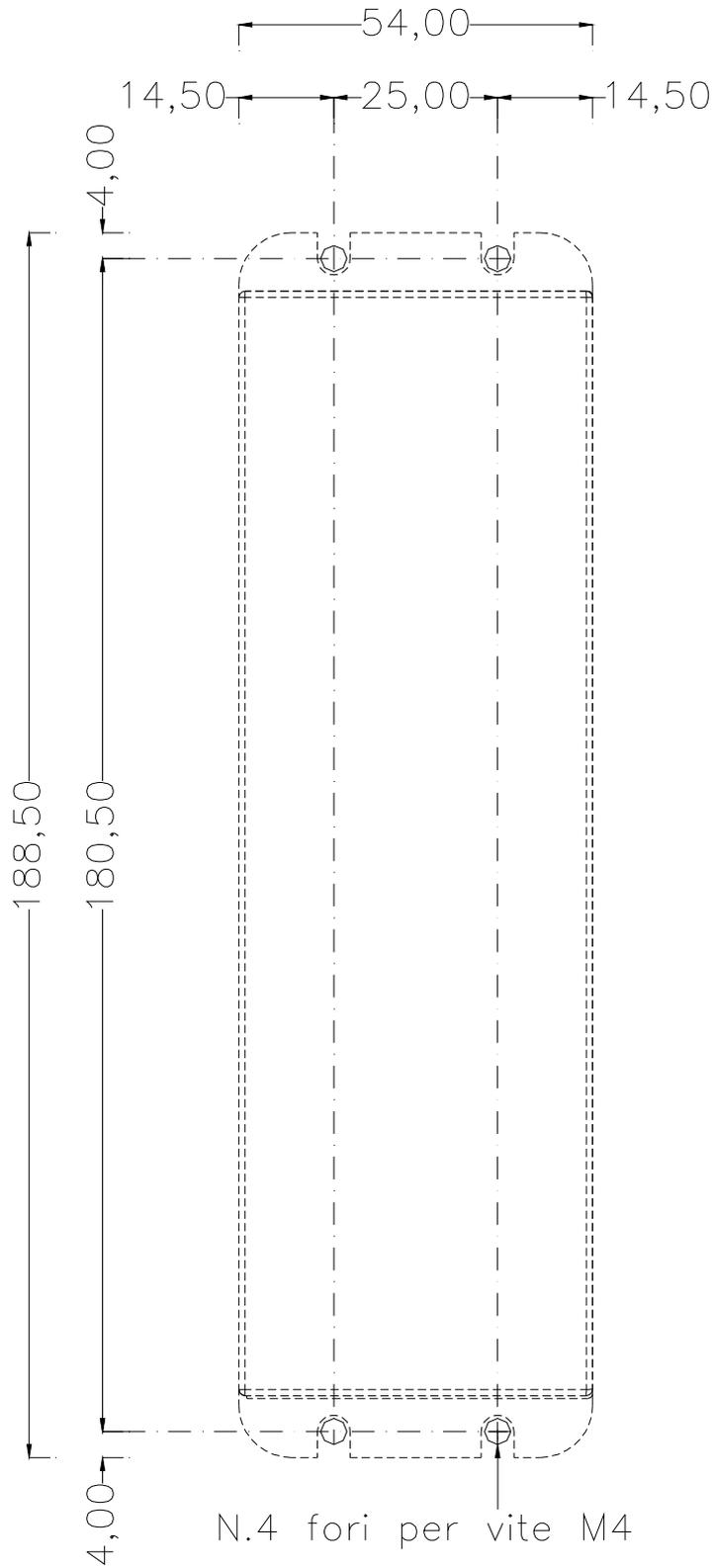
Figure 15 : Drilling template

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Chapter 7 SAFETY APPENDIX

7.1 INTRODUCTION

The FCT200 system complies with the following European standards:

EUROPEAN STANDARDS	
IEC EN 61131 -2	Programmable controllers Part 2 : Apparatus specifications and tests
CEI EN 60204-1	Machinery safety - Machines' electric equipment Part 1 : General rules

The FCT200 system is a category III device, for which protection against the risks of electric discharges is guaranteed by the presence of low voltage circuits.

7.2 SERVICE CONDITIONS AND SPECIFICATIONS RELATIVE TO THE PHYSICAL ENVIRONMENT

The FCT200 system was designed to be safe under the following conditions:

CONDITIONS OF USE	
Surrounding temperature (inside the main switchboard)	5 °C ÷ 45 °C
Relative humidity	Rh2 (5 % 1 95 %) or lower than 85% for T>40°C
Level of pollution	II
Altitude	2000 m a.s.l.

7.3 ELECTRIC SPECIFICATIONS

WARNING

The electric specifications, the fields used and the methods of installation and maintenance of the FCT200 part sections are described in detail in the specific paragraphs. The following indications should also be observed for safety purposes:

– Correctly connect the power cable socket to the relative connector, following the instructions on the panel itself. In order to improve the system's performance as regards disturbances, you will have to connect up the functional earth, using the screw clamp found on the side of the power connector.
– Before powering the device, make sure that the powering system used corresponds with the specifications shown in paragraph 2.1.2 .

Chapter 8 ELECTROMAGNETIC COMPATIBILITY APPENDIX

8.1 STANDARDS COMPLIANCE

The FCT200 system complies with the specifications in the directive on electromagnetic compatibility 2004/108/CE CEE which in the industrial sector foresees the application of the following European standards:

STANDARDS	
EN 61131– 2	product standard
EN 61000 – 6 – 4	standard on emission
EN 61000 – 6 – 2	standard on immunity

In compliance with these standards, the tests that the system passed under examination are shown below:

- **Electrostatic discharge immunity test (EN 61000-4-2 standard)**
- **Irradiated electromagnetic field immunity test (EN 61000 - 4 - 3 standard)**
- **Conducted electromagnetic field immunity test (EN 61000 - 4 - 6 standard)**
- **Immunity to fast transients test (EN 61000-4-4 standard)**
- **Conducted emission test on the frequency range 0.15-30 MHz (EN-55011 standard)**
- **Irradiated emission test on the frequency range 30-1000 MHz (EN55011 standard)**

Chapter 9 ORDER CODE

ORDER CODE	
CODE	**DESCRIPTION**
FCT200.1100	FCT200 System full version 2 CAN+ETH+ RS232+SMI+PROFIBUS
FCT200.0100	FCT200 System reduced version CAN+ETH+ RS232+SMI

N.B.: *All the foreseen options must be specified when the order is being placed.*

Chapter 10 REVISION HISTORY

HW_FCT200	
Revision /Issue Date	**DESCRIPTION**
0 / 15-11-2007	Issuing document
1 / 12 - 05-2008	Update for SMI port description, insertion of CAN port maximum baud rate.
1.1 /02 – 10 – 2008	Update form imperfections.
2 / 28 – 06 -2011	Update document for LOCAL IO' wirings, ethernet port pinout's drawings, reviewed ordering code.