USER MANUAL

DigiCrown probing line

TESTAR
A MARPOSS DIVISION

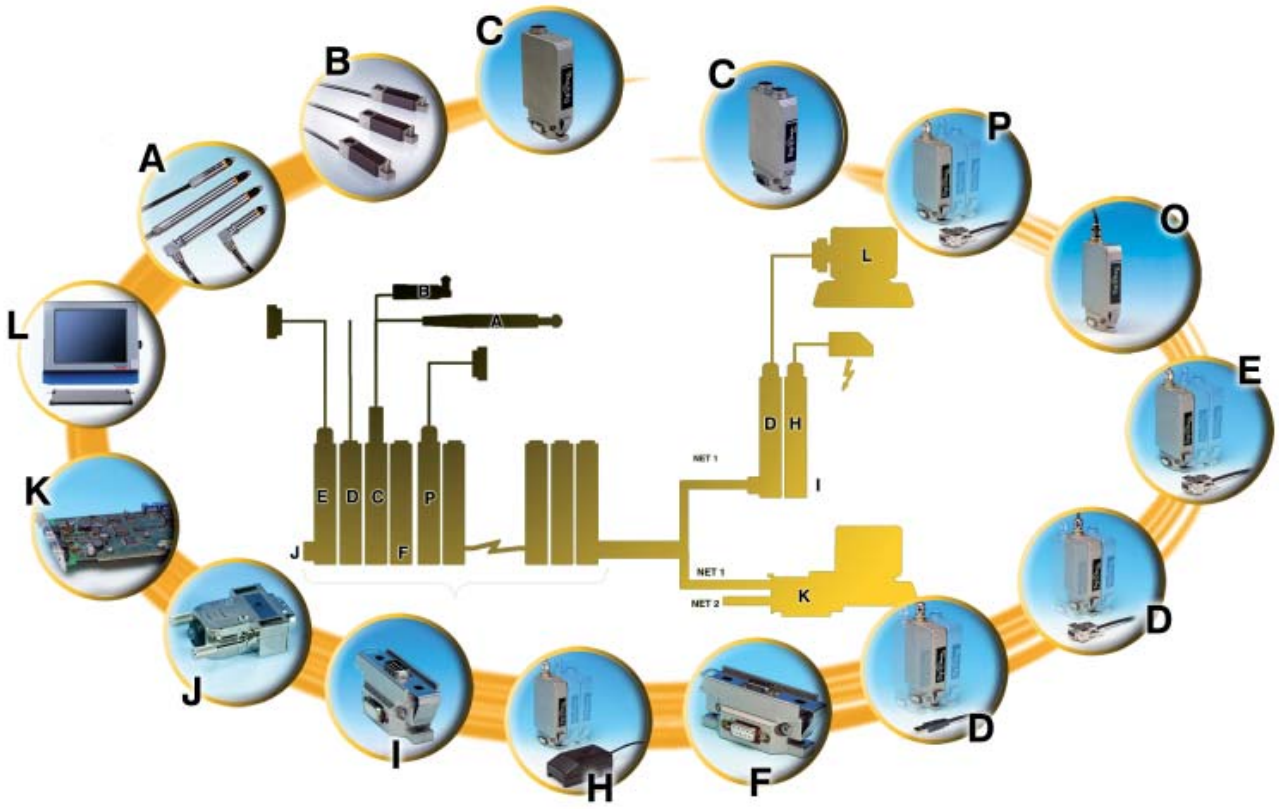
INDEX


DigiCrown
probing line

1 INTRODUCTION TO DIGICROWN PROBING LINE SYSTEM

The *DigiCrown* is a flexible measuring system (from 1 to 372 sensors), configured in networks (from 1 to 12) that can be connected to a PC via an RS232/USB serial interface or dedicated RS485 interface cards for PCI or ISA bus.

The diagram below shows the elements of the *DigiCrown* system in their possible configurations. This user manual follows up the installation of the *DigiCrown* box unit.



MARPOSS S.p.A. does not take on the obligation of notifying possible further changes to the product.
The descriptions reported in this book do not authorize any tampering by non-authorized personnel.

2 DIGICROWN BOX(C)

2.1 Application notes

The primary function of the *DigiCrown box* module is to acquire the measurement coming from the input sensor, to convert it, then linearize it into a digital signal.

The Marposs LVDT digital pencil probes are automatically recognized by the *box* module. The characteristics of the digital pencil probe are stored in its own memory, physically allotted into the Lumberg connector. Through its central pin, this information is transferred from the connector to the EEPROM retentive memory contained in the *box* module.
If an analog LVDT pencil probe is connected, the module detects the lack of information. Anyway the unit can be configured with the range information and sensitivity data, stored in the EEPROM retentive memory of the *box* module.

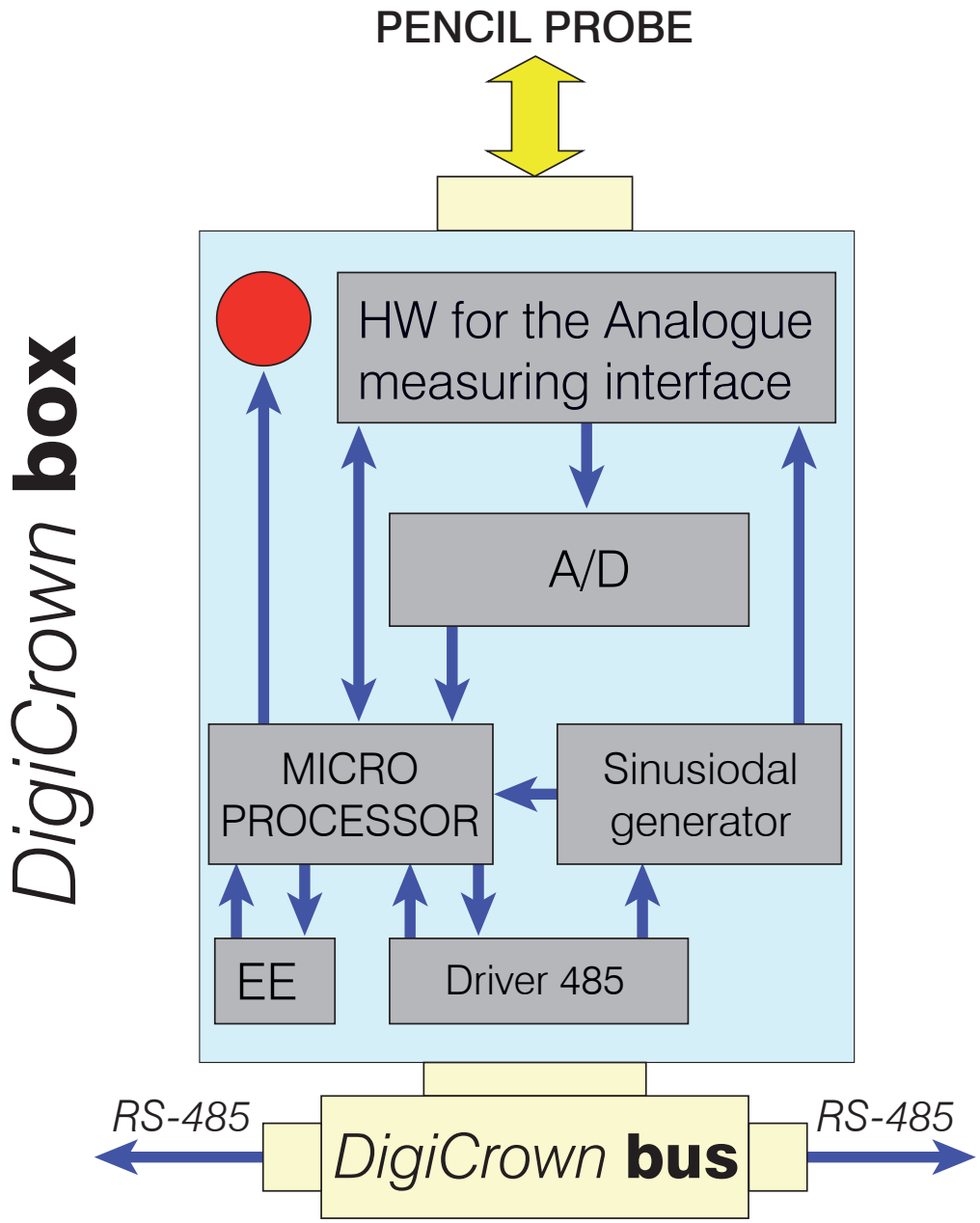
A version of the *DigiCrown box* module with an additional RAM is available, in order to make it possible to expand the quantity of storable data to 9,000, thus achieving a “buffering” of the sampling data to be transmitted to the managing system.

The module includes a sine wave generator that transforms the external frequency from 75 KHz to 7500 Hz, for the management/control of the transducer. A synchronization mechanism ensures the phase relationship between the two frequencies, so the system is an “isofrequency” one.

The *box* module is assembled on the *DigiCrown bus* unit, by means of which the communication with the data acquisition system with serial RS-485 standard is carried out. The connection to the *bus* module is made by means of a 9-way sub D-type connector that also supplies power to the *box* module.

Each *box* module, contains a LED for a quick diagnosis of the operating status of the unit (see Chapter 3).

2.2 Internal structure



2.3 Technical specifications

Reading rate/s	250
Sampling storage	• 50 (standard version) • 9000 (version with RAM)
Power absorption	40mA
Operating temperature	0 ÷ 60°C
Storing temperature	-20 ÷ +70°C
Protection degree	IP 43
Alimentazione	+7,5Vdc (-10% + 30%)
Input	connection to sensor via IP68 Lumberg connector
Output - serial communication	communication towards bus via DigiCrown HW and RS485 serial protocol, half duplex (8 bit + 1 bit multiprocessor addressing)
Measurement settling time	consider a 20 minutes settling time
Dimensions	see Chapter 15

Pencil Probe range (mm)	1	2	5	10	20
Resolution (µm)	0,05	0,05	0,2	0,2	0,5

3 DIGICROWN BOX(C) CH2

3.1 Application notes

The primary function of the *DigiCrown box* module two channels is to acquire the measurement coming from the input sensor, to convert it, then linearize it into a digital signal.

The Marposs LVDT digital pencil probes are automatically recognized by *box* module with two channels. The characteristics of the digital pencil probe are stored in its own memory, physically placed into the Lumberg connector. Through its central pin, this information is transferred from the connector to the EEPROM retentive memory contained in the *box* module.
If an analog LVDT pencil probe is connected, the module detects the lack of information. Anyway the unit can be configured with the range information and sensitivity data, stored in the EEPROM retentive memory of the *box* module.

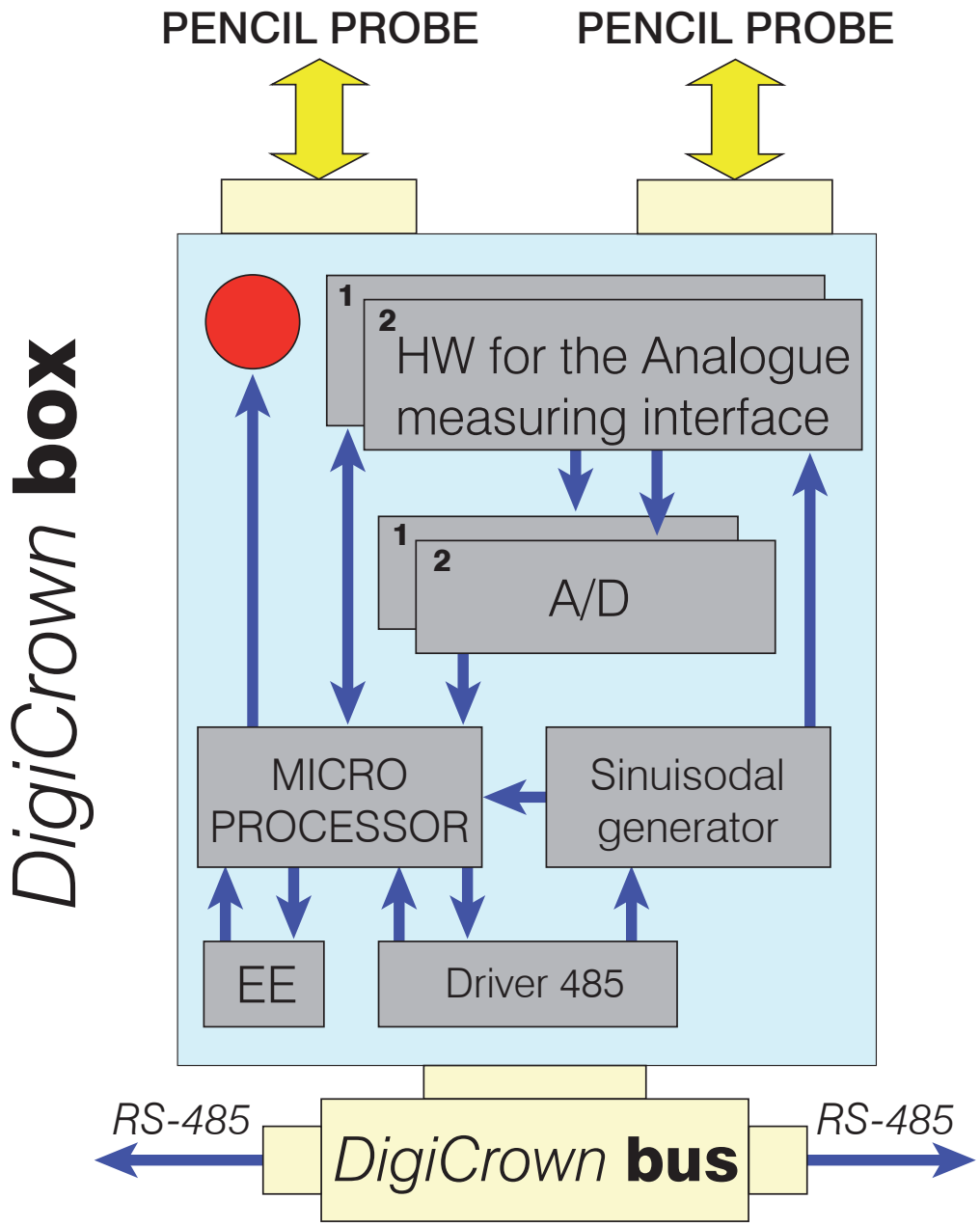
A version of the *DigiCrown box* module with an additional RAM is available, in order to make it possible to expand the quantity of storable data to 9,000 (4.500 for each transducer), thus achieving a “buffering” of the sampling data to be transmitted to the managing system.

The module includes a sine wave generator that transforms the external frequency from 75 KHz to 7500 Hz, for the management/control of the transducer. A synchronization mechanism ensures the phase relationship between the two frequencies, so the system is an “isofrequency” one.

The two channels *box* module is assembled on the *DigiCrown bus* unit, by means of which the communication with the data acquisition system with serial RS-485 standard is carried out. The connection to the *bus* module is made by means of a 9-way sub D-type connector that also supplies power to the *box* module.

Each box module, contains a LED for a quick diagnosis of the operating status of the unit (see Chapter 3).

3.2 Internal structure



3.3 Technical specifications

Number of transducers	2
Reading rate	4000 samples per second (two simultaneous transducers)
Sampling storage	up to 4500 samples for each transducer
Power absorption	90mA
Operating temperature	0 ÷ 60°C
Storing temperature	-20 to +70°C
Protection degree	IP 43
Power supply	+7,5Vdc (-10% + 30%)
Input	connection to sensor via IP68 Lumberg connector
Output - Serial communication **- Baud rate**	• Communication towards bus via Digi Crown HW and RS485 serial protocol • Up to 2083Kbps.
Dimensions	see Chapter 15

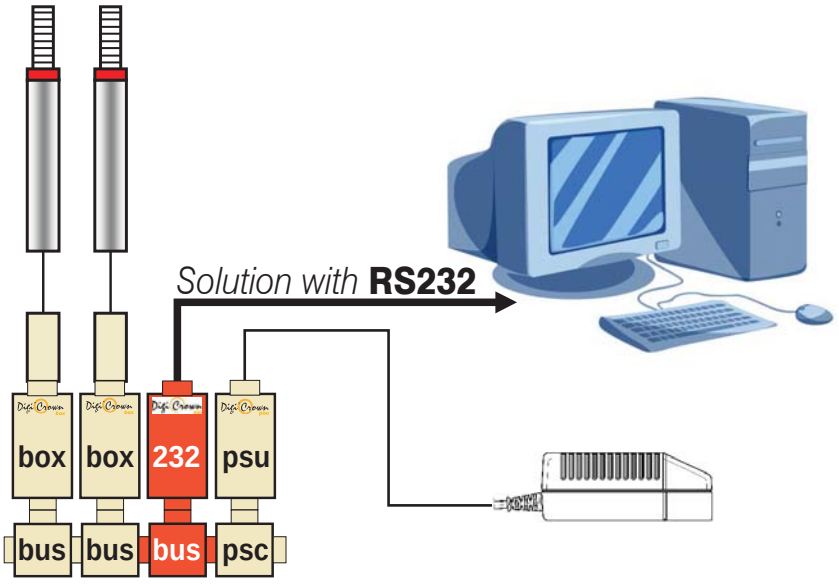
Pencil Probe range (mm)	1	2	5	10	20
Resolution (µm)	0,05	0,05	0,2	0,2	0,5

4 DIGICROWN BOX(C) 232 UNIT

4.1 Application notes

The typical application of the **232** module is the interfacing of the *DigiCrown* NET with a PC equipped with an RS-232 standard serial port (Fig. 1).

The **232** module requires to be matched with a **PSU** unit for the NET power supply. The **232** module embeds a 2m cable with a 9-way sub D-type female connector. By means of this cable is possible to connect the unit straight in a PC RS-232 serial port.

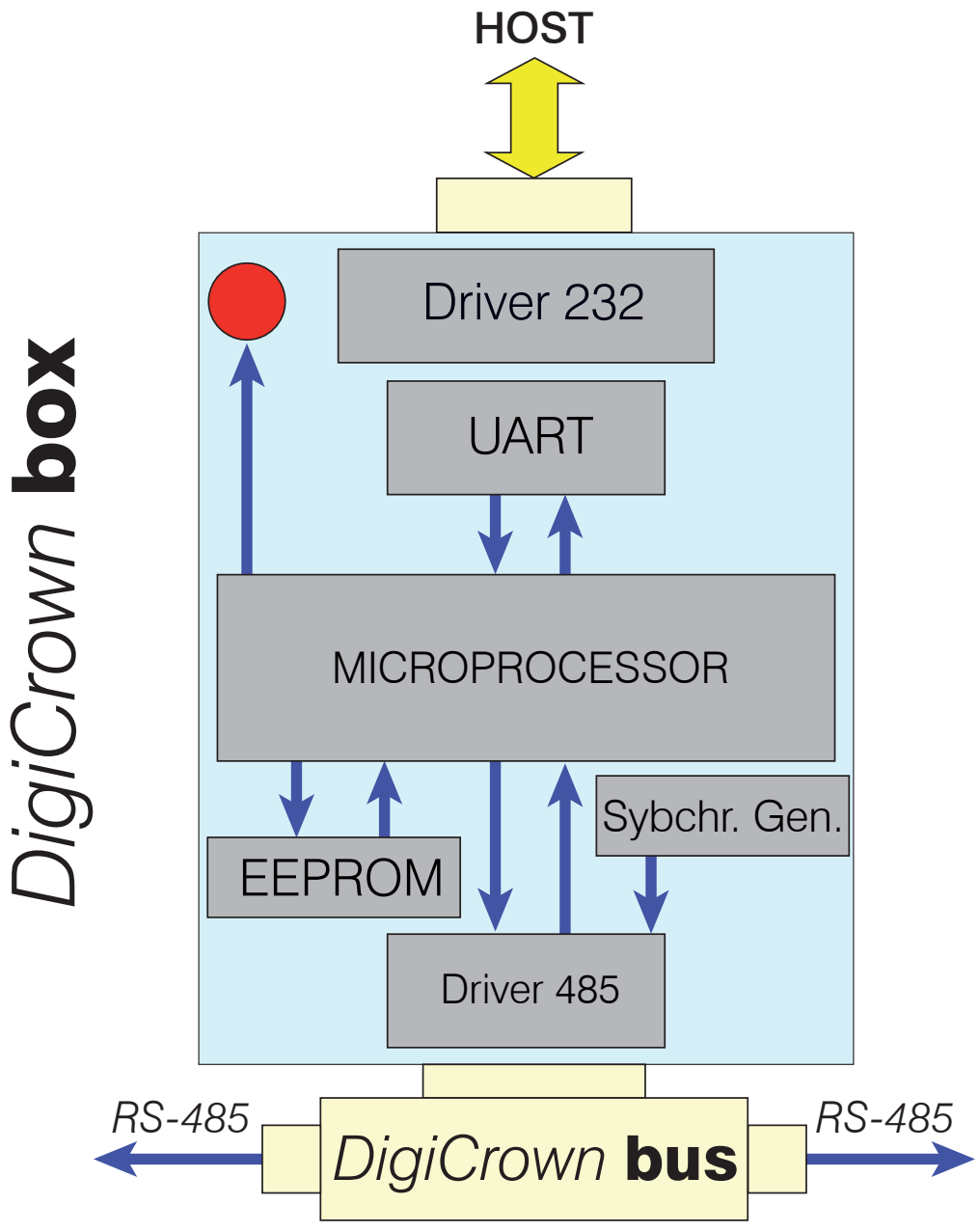


The **232** module is fitted on the *DigiCrown bus* unit, by means of which the communication with the data acquisition system takes place. The **232** module supplies to the *bus* connector a square wave with a 75 KHz frequency, for the generation of the sine wave that synchronizes the transducers. The connection to the *bus* module is made via a 9-way sub D-type connector, which also supplies power to the **232** module.

Within the CPU integrated in the module, there is an EEPROM memory for the management of the retentive-type data.

Each **232** module, moreover, contains a LED for a quick diagnosis of the operating status of the unit (see Chapter 3).

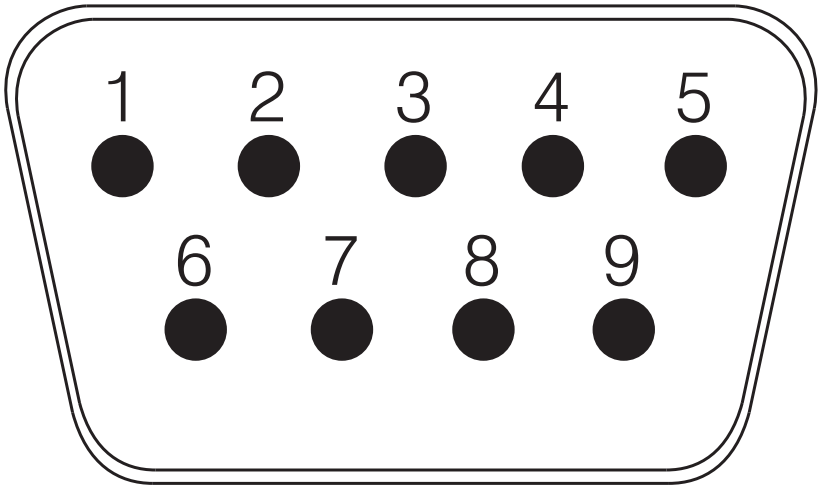
4.2 Internal structure



4.3 Technical specifications

Communication	1 RS232 full-duplex channel no “handshake” (RTS/CTS), or alternatively “hardware handshake”
Port setting	• baud: 4800/ 9600 (default)/ 19200/ 38400/ 57600/ 115200 bit/sec • bit number 8 • bit stop number 1 • parity EVEN
Bus interface	serial interface RS485 Half-Duplex
Power absorption	40mA
Operating temperature	0 ÷ 60°C
Storing temperature	-20 to +70°C
Protection degree	IP 43
Power supply	+7,5Vdc (-10% + 30%)
Input	RS232 9-way sub D-type female connector
Dimensions	see Chapter 15

4.4 RS-232 connector pin-out (9-Way D-Sub)



1 = NC
2 = TX
3 = RX
4 = NC
5 = GND
6 = NC
7 = CTS
8 = RTS
9 = NC

5 DIGICROWN BOX(C) USB UNIT

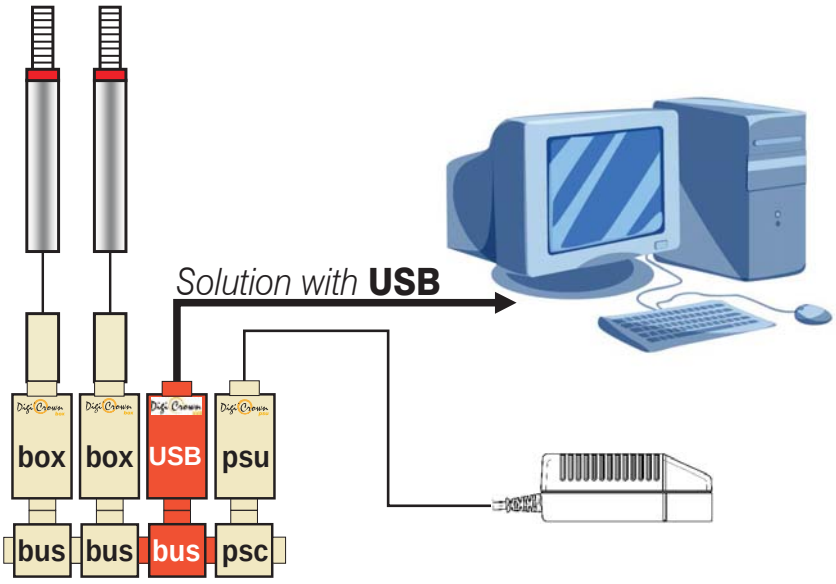
5.1 Application notes

The *DigiCrown* **USB** is now available in two configurations

- USB full speed
- USB high speed

The USB full speed works with PC USB version V1.1 mistead the latest high speed works with PC USB version V2.0.

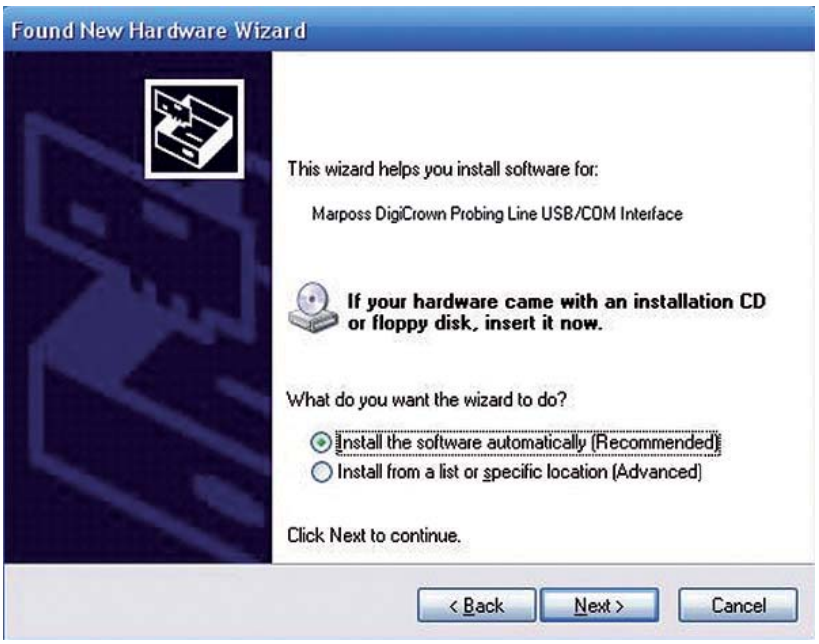
The **USB** module requires to be matched with a PSU unit for the NET power supply (see figure 2).



Installing *QSPC*, *Easy Acquisition* or the *Marposs Driver Library*, will allow the automatic detection of the **USB** unit as soon as it's plugged to the host PC. As soon as Windows finds the new hardware connected, select the option "Install the software automatically" and click on "Next" (fig. 3). The driver for the **USB** unit will then be installed.

The software configuration of the USB module (using the *MDHQSPC driver*) is done in the same manner as for the 232 unit.

Using the wizard it is possible to identify automatically the available COM port to be plugged and to be used for the communication during the net configuration.



5.2 Technical specifications

	USB FULL SPEED	USB HIGH SPEED
Communication	1 virtual COM channel with USB interface (compatible with USB 1.1 / 2.0 standards)	
Port setting	• to activate the full speed program a baud higher than 9600 bit/sec (19200 / 38400 / 57600 / 115200 bit/sec) • bit number 8 • bit stop number 1 • parity EVEN	Any programmed baud active the maximum USB speed: • 12Mbit/s if connected to a full speed port • 480Mbit/s if connected to a high speed port
Bus interface	serial interface RS485 Half-Duplex	
Power absorption from bus 485	40 mA	90mA
Power absorption from usb	26 mA	Any absorption from the usb
Operating temperature	0 ÷ 60°C	
Storing temperature	-20 ÷ +70°C	
Protection degree	IP 43	
Power supply	+7.5Vdc (-20% +30%)	
Input	Type “A” USB connector	
Dimensions	see Chapter 15	

6 DIGICROWN BOX(C) AI

6.1 Application notes

The *DigiCrown ai* module has been developed for managing analog inputs (tension or current) to the DigiCrown system. Through this module it is possible to integrate in the network third-party sensors such as load cells, torque sensors, flow-meters, pressure and humidity sensors.

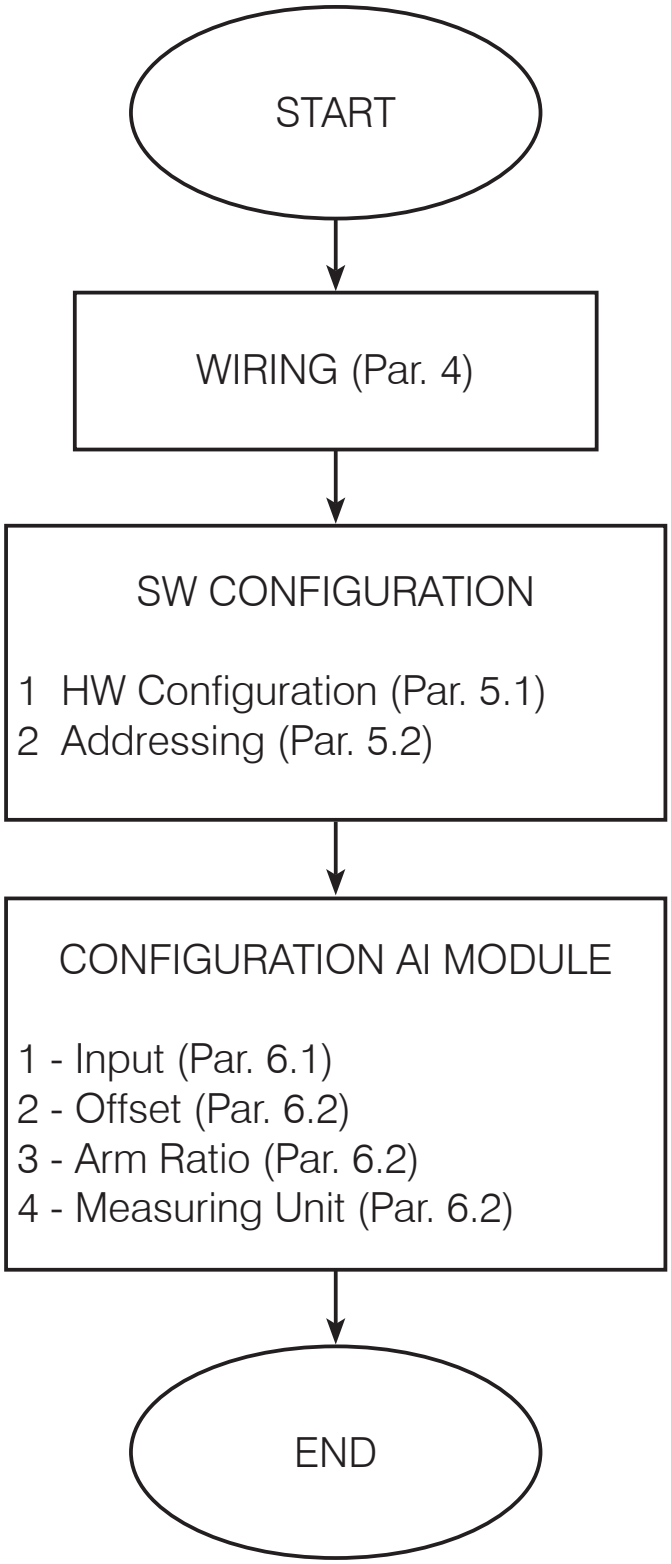
The **ai** module is assembled on the *DigiCrown bus* unit, by means of which the communication with the data acquisition system with serial RS-485 standard is carried out. The connection to the bus module is made by means of a 9-way sub D-type connector that also supplies power to the **ai** module.

Each **ai** module, contains a LED for a quick diagnosis of the operating status of the unit (see chapter 4).

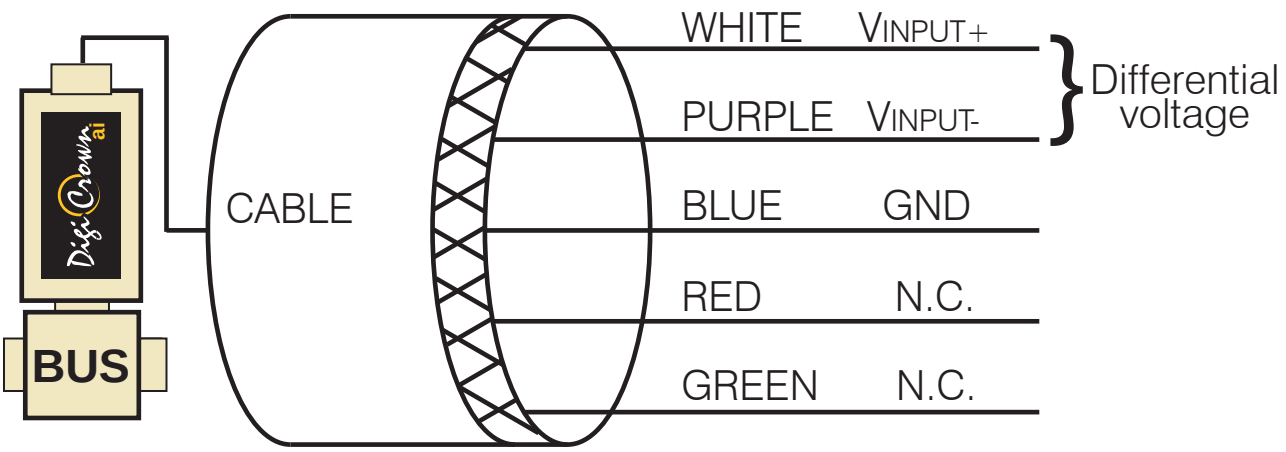
In order to avoid power overloads of the RS485 network, the sensor is powered through an external voltage supply.

6.2 Sequence of operations

The connection of an analog sensor requires the wiring of the hardware and a software configuration to define the input type, arm-ratio, offset and measuring unit of the sensor.



6.3 Wiring



The module comes with an unplugged cable.

The wiring must be done by the end-user according to the application requirements.

The cable is shielded with a metal braiding.

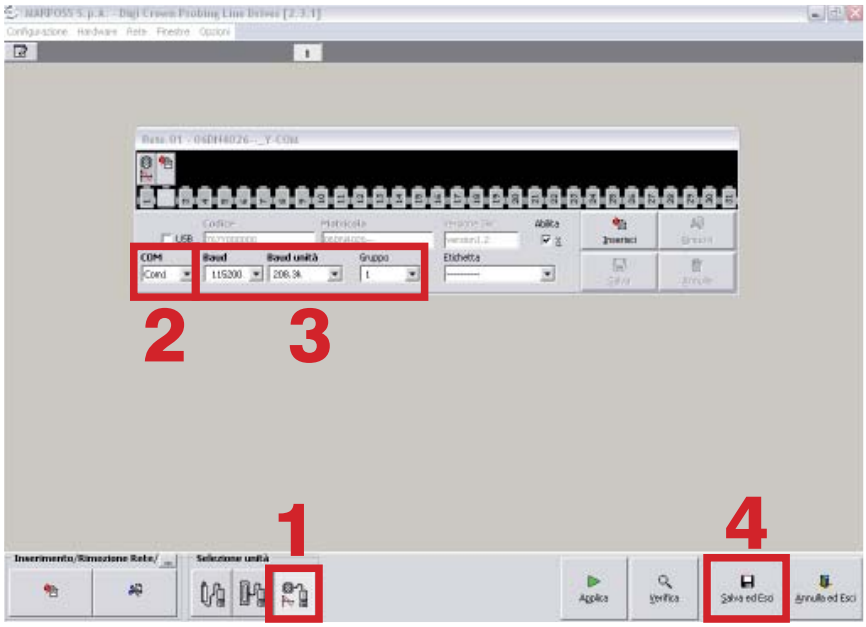
WIRING INSTRUCTIONS: to ensure the wiring complies with the EMC specifications, it is necessary to use a shielded connector. Make sure the metal braiding of the cable is wired to the connector in all its entire surface (360°).

The maximum voltage between the input and the ground connector must be less or equal to ±12,5 V.

6.4 Software configuration

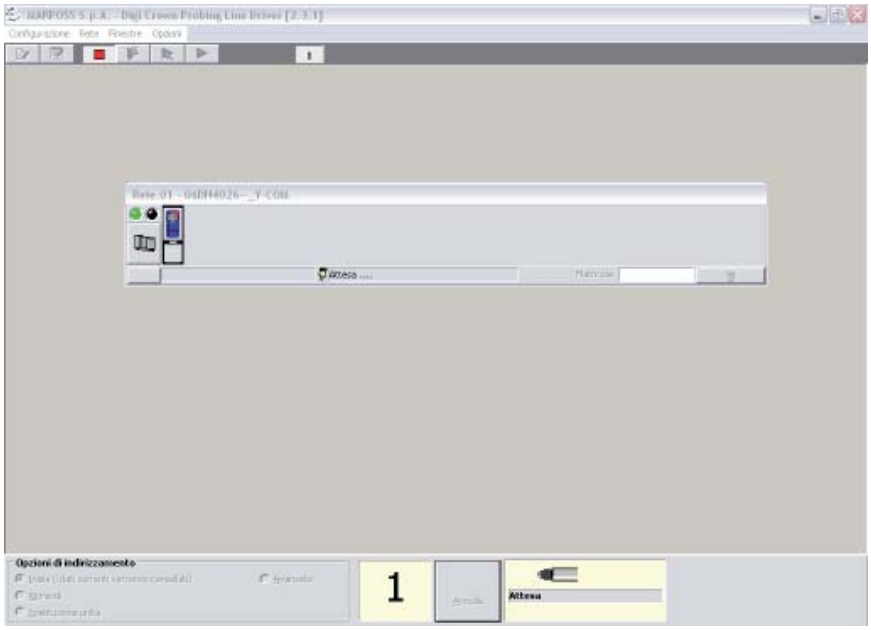
6.4.1 Hardware configuration

1. Install the analog box input in the DigiCrown NET.
2. Select the COM port used by the DigiCrown network.
3. Program the baud at the maximum value.
4. Save.



6.4.2 Addressing

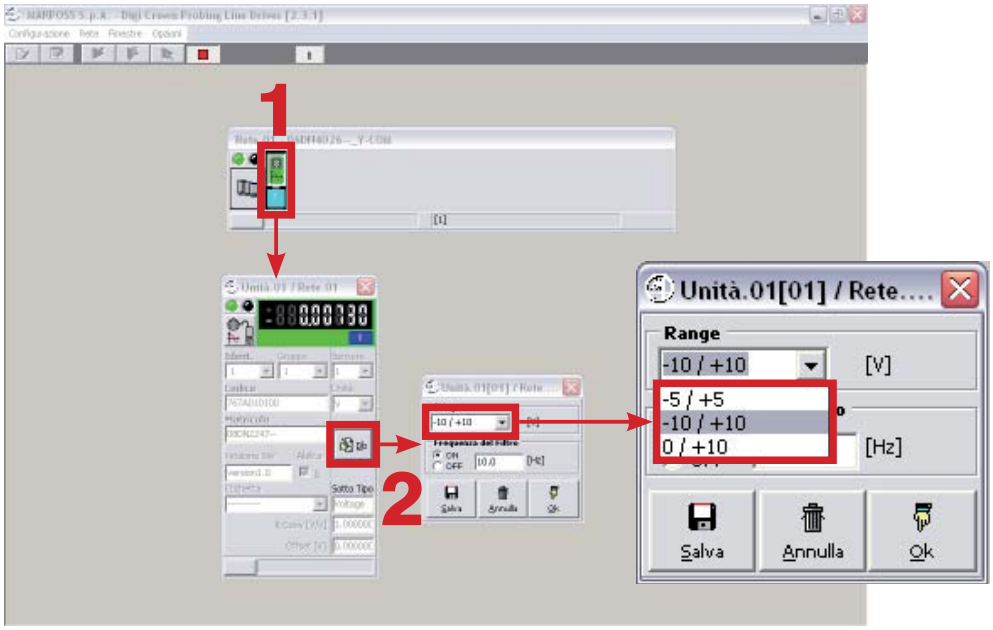
Once the analog sensor has been wired to the “ai” module, perform the addressing procedure by pressing/moving the sensor in order to have it detected by the system (manual addressing).



6.5 Configuration of the AI module

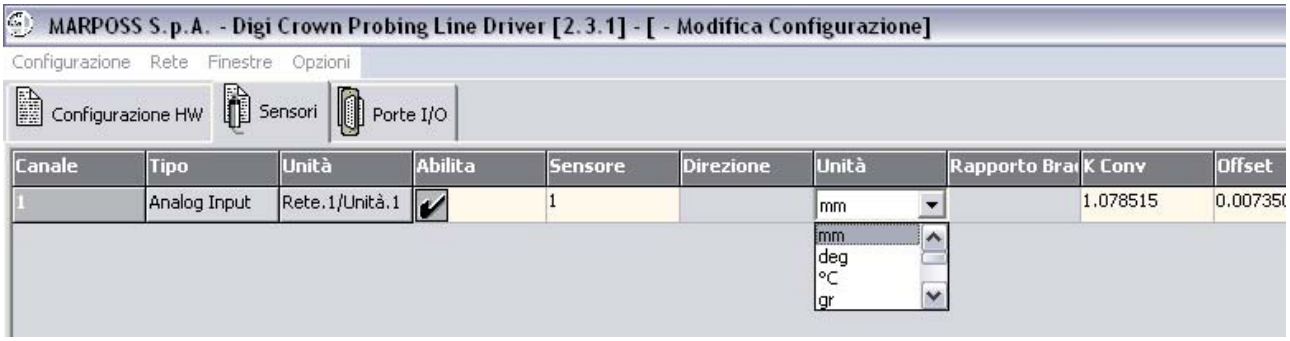
6.5.1 Input

In On-Line mode, set the range and the input type (see specifications at page 18).



6.5.2 Offset, arm ratio and measuring unit

Exit the On-Line mode by pressing the “Stop” button (1). Set the parameters (offset, arm ratio, measuring unit…) of the sensor in the “Edit current configuration” page by pressing the relevant button (2).



6.6 Technical specifications

INPUT	
Voltage Input	± 10 V ± 5 V 0-10 V (Input impedance >100KΩ)
Current Input	± 20 mA 4-20 mA 0-20 mA (Input impedance > 23Ω)
Resistance Input	50...3000Ω 50...500Ω (Measure current 3mA, 4 wires connection)
Measurement Bandwidth	Programmable from 5 to 750 Hz
OUTPUT	
Voltage Resolution	0,02 mV - (range ± 5 V) 0,05 mV - (range ± 10 V)
Current Resolution	0,0001 mA
Resistance Resolution	0,1 Ω (range 50-3000 Ω) 0,01 Ω (range 50-500 Ω)
Serial communication	DigiCrown bus & protocol Baud rate fino a 2083Kbps
Reading Speed	4000 sample/s
Buffer dimension	10450 sample/s
PERFORMANCE	
Linearity	< 0.01% FSO
Voltage Gain Temperature Coefficient	70 ppm/°C
Current Gain Temperature Coefficient	106 ppm/°C
Offset (all ranges and input type, factory calibrated)	On the level of the noise
Voltage Offset Temperature Coefficient	23 ppm/FSO/°C
Current Offset Temperature Coefficient	110 ppm/FSO/°C
Warm Up Time	95% accuracy met after 5 minutes from switch on
Calibration & Measurement Accuracy	Gain and offset for all input type

ENVIRONMENTAL	
Storage Temperature	-20 °C to + 70°C
Operating Temperature	0 °C to +60 °C
Operating Voltage	+ 7,5 VDC (-10%+30%) (powered from the Bus)
Operating Current • *Voltage, current and resistance conf* • *4-20 mA conf*	 100 mA (with light load on VEXT) 150 mA (with 20mA powering sensor from VEXT)
Interface	Digi Crown Network

7 DIGICROWN BOX(C) EI

7.1 Application notes

The *DigiCrown ai* module has been developed for managing analog inputs (tension or current) to the DigiCrown system. Through this module it is possible to integrate in the network third-party sensors such as load cells, torque sensors, flow-meters, pressure and humidity sensors.

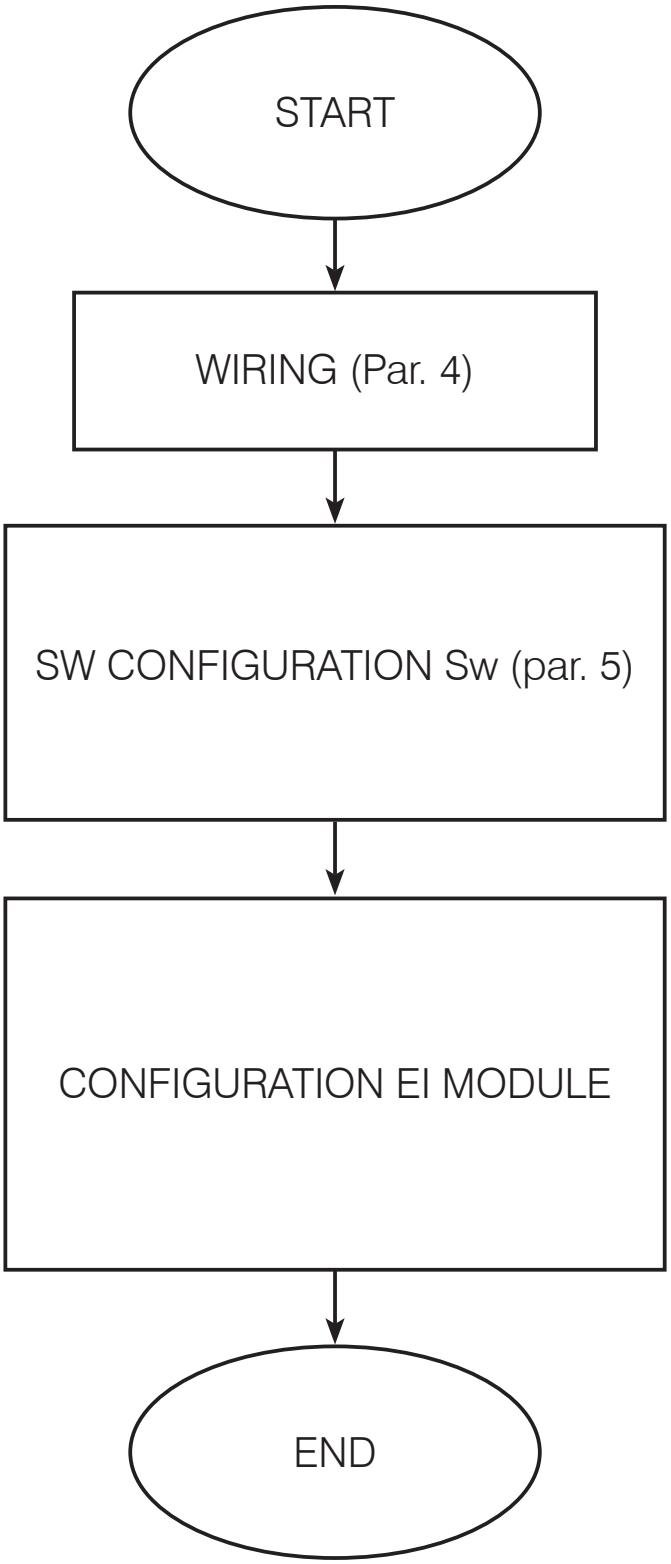
The **ei** module is assembled on the *DigiCrown bus* unit, by means of which the communication with the data acquisition system with serial RS-485 standard is carried out. The connection to the bus module is made by means of a 9-way sub D-type connector that also supplies power to the **ei** module.

Each **ei** module, contains a LED for a quick diagnosis of the operating status of the unit (see chapter 4).

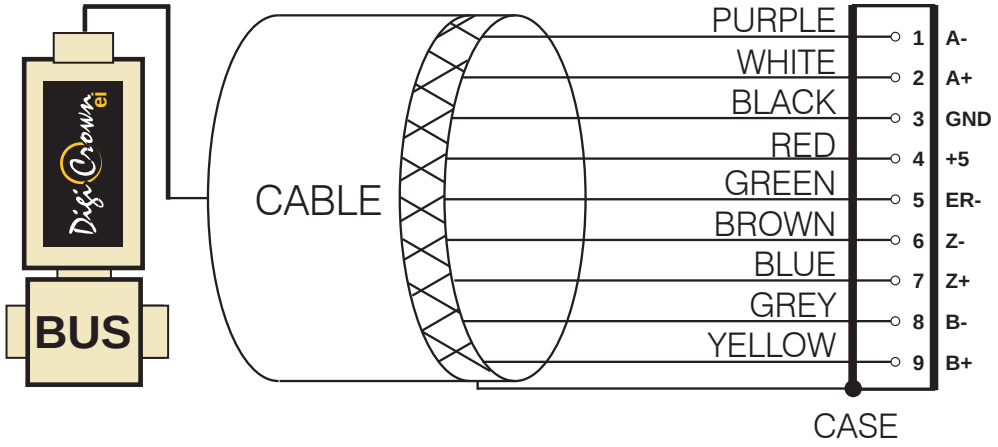
In order to avoid power overloads of the RS485 network, the sensor is powered through an external voltage supply.

7.2 Sequence of operations

The connection of an analog sensor requires the wiring of the hardware and a software configuration to define the input type, arm-ratio, offset and measuring unit of the sensor.



7.3 Wiring



The module comes with an unplugged cable.

The wiring must be done by the end-user according to the application requirements.

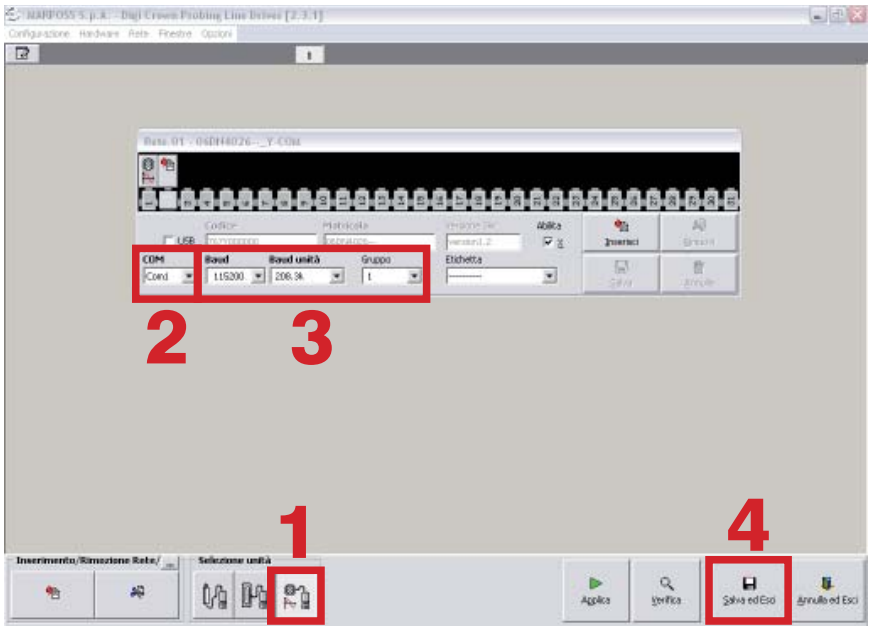
The cable is shielded with a metal braiding.

WIRING INSTRUCTIONS: to ensure the wiring complies with the EMC specifications, it is necessary to use a shielded connector. Make sure the metal braiding of the cable is wired to the connector in all its entire surface (360°).

7.4 Software configuration

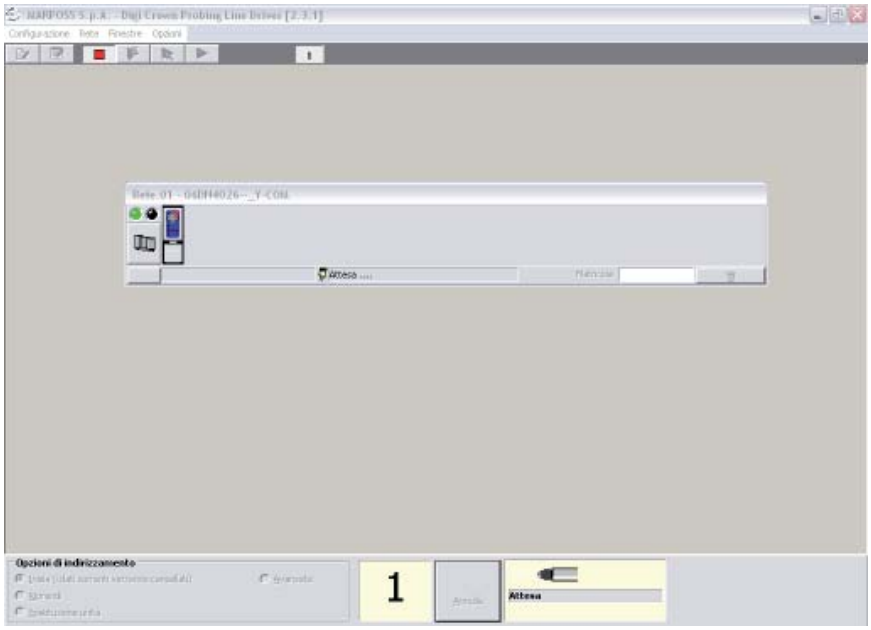
7.4.1 Hardware configuration

1. Install the analog box input in the DigiCrown NET.
2. Select the COM port used by the DigiCrown network.
3. Program the baud at the maximum value.
4. Save.

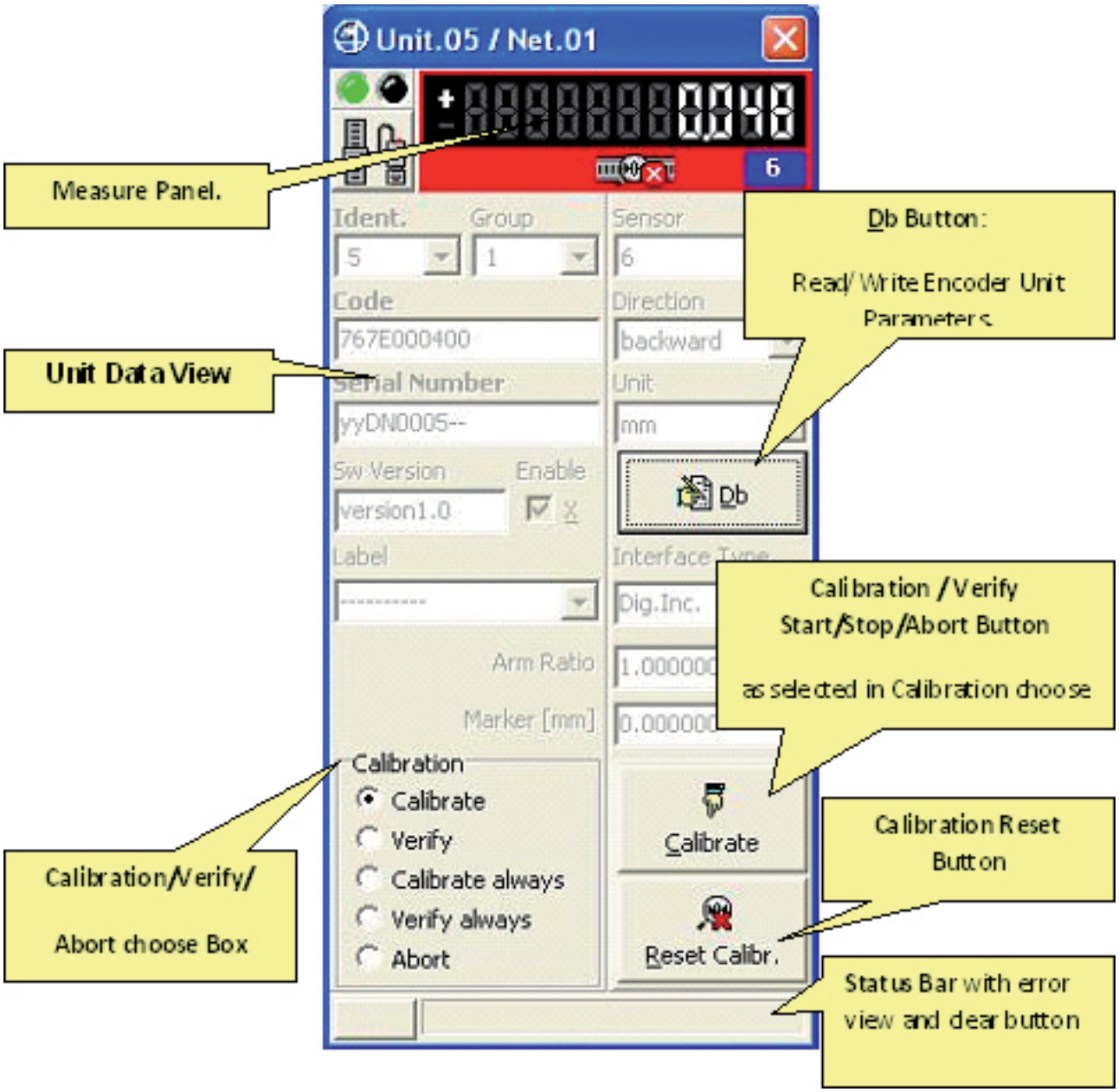


7.4.2 Addressing

Once the analog sensor has been wired to the “ai” module, perform the addressing procedure by pressing/moving the sensor in order to have it detected by the system (manual addressing).



7.5 Incremental digital encoder unit form



Incremental Digital Encoder Unit Form in On-Line mode
(example for On-Line Operative mode, maximized format)

Calibration/Verify/Abort choose Box let select a Calibration/Verify cycle for further start or select the Abort for further stop.

Calibration/Verify Start/Stop/Abort Button let starting a calibration or verify cycle or stopping it.
Calibration/Verify Cycle can be:

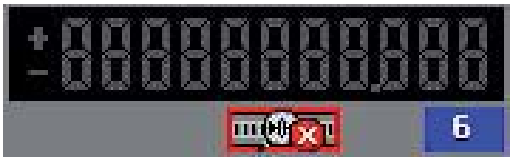
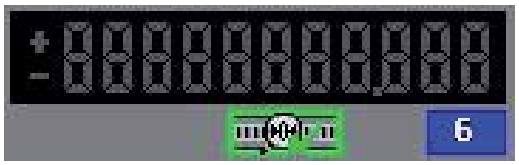
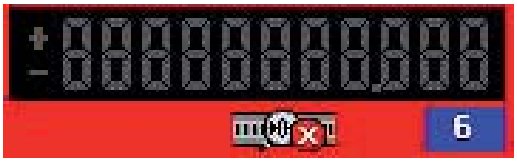
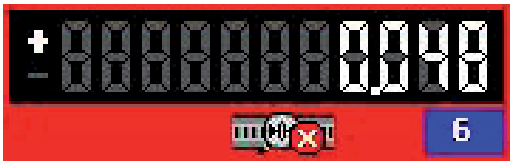
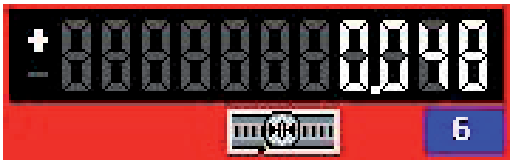
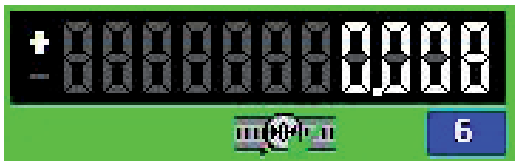
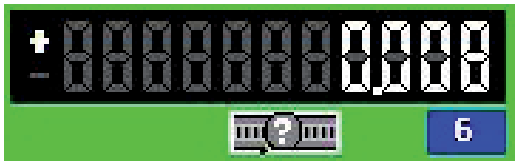
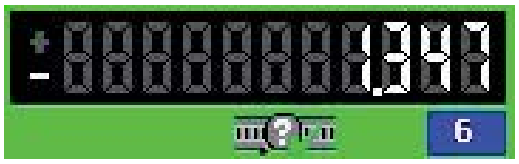
- single (1st Marker signal detection calibrates/verifies Unit), and must be stopped or aborted
- never-ending (all Markers signal detection calibrate/verify Unit), and can be aborted if required

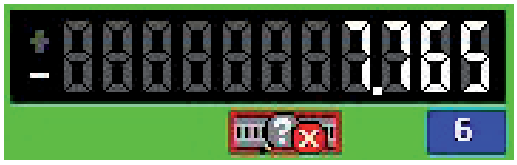
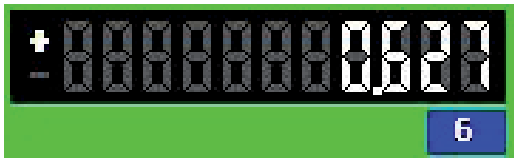
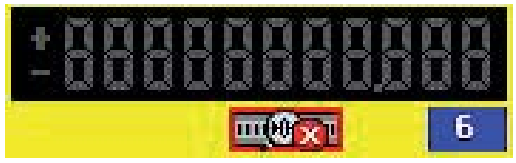
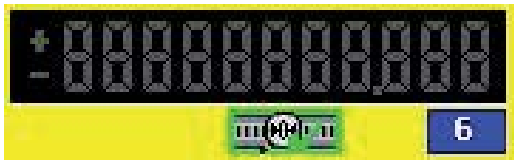
Calibration Reset Button let erase immediately zeroings on Unit, forcing its state to not calibrated.

If Marker signal is programmed OFF (not provided):

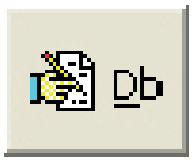
- *single calibration and verify are immediate*
- *never-ending calibration and verify are not supported*

7.5.1 Measure panel

Measure Panel image explanation	
	**Unit in transitory** Input not jet acquired. Encoder not calibrated.
	**Unit in transitory** Input not jet acquired. Encoder calibrated.
	**Unit in alarm** Encoder not connected Encoder Phase-A , Phase-B , Marker signal wrongly connected. Encoder Alarm or Over-Speed.
	**Unit is properly working in not calibrated state** Encoder not calibrated.
	**Unit is properly working in not calibrated state** Encoder not calibrated , calibration cycle pending.
	**Unit is properly working in calibrated state** Encoder calibrated, calibration done with success. Measure in range.
	**Unit is properly working in calibrated state** Encoder calibrated , verify cycle pending. Measure in range.
	**Unit is properly working in calibrated state** Encoder calibrated , calibration verify done with success (match). Measure in range.

	**Unit is properly working in calibrated state** Encoder calibrated , calibration verify done with error (unmatch). Measure in range.
	**Unit is properly working in calibrated state** Encoder calibrated, no verify information available. Measure in range.
	**Unit is working with over-range warning** Encoder calibrated. Measure out of range.
	**Unit is working with over-range warning** Encoder not calibrated . Measure out of range.

7.5.2 Read/Write Incremental Digital Encoder Unit Parameters



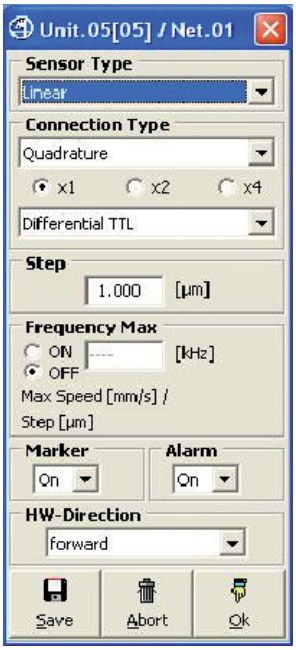
This button opens a dedicated new form for reading or writing the Unit parameters. All data are uploaded directly from Unit and, on modify, downloaded directly into Unit.

Sensor Type Parameter let choose between 4 available acquisition modes:

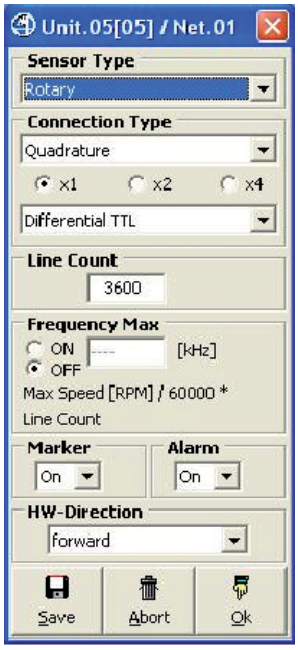
- Linear [mm]
- Rotary [degrees]
- Periodic [degrees with 360° module]
- Counter [no unit as default , unit programmable as required]

Parameter Form behaviour depends on Sensor Type Parameter programmed value.

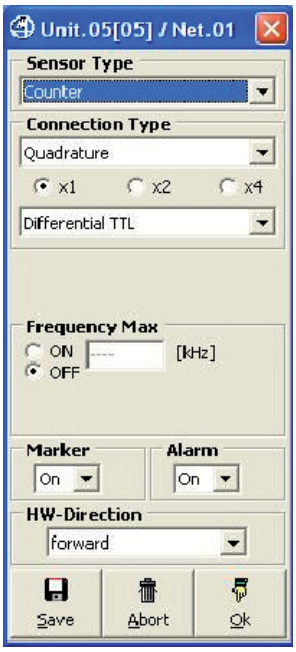
Digital Encoder
Unit **Linear**
Parameters Form



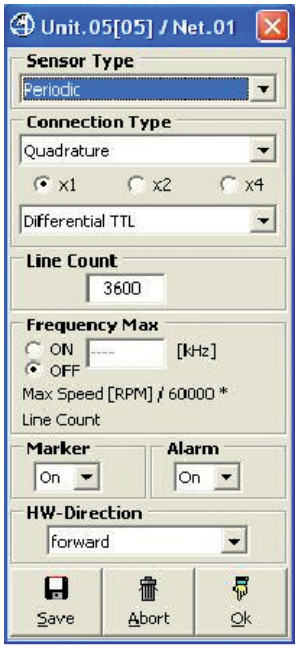
Digital Encoder
Unit **Rotary** [degrees]
Parameters Form

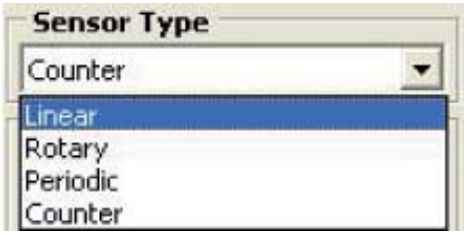


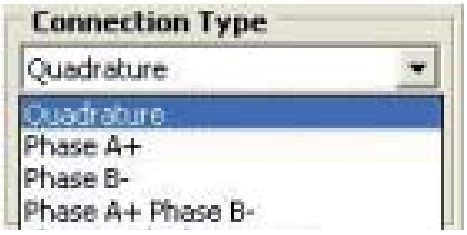
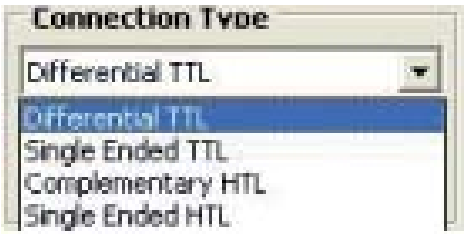
Digital Encoder
Unit **Periodic** [degrees]
Parameters Form



Digital Encoder
Unit **Counter**
Parameters Form



Parameter	Meaning
Sensor Type	 **Linear:** Signed measure [mm], based on Step parameter applies to Linear Encoder and produces a measure with dimensional attribute, that can overflow. **Rotary:** Signed angular measure [degrees], as ±360°*Round, based on Line-Count parameter. Applies to Rotary Encoder and produces a ±360°*Round measure with degree attribute, that can overflow. **Periodic:** Signed angular measure [degrees], module(360°), based on Line-Count parameter. Applies to Rotary Encoder and produces a module (360°) measure with degree attribute, that never overflows. **Counter:** Signed counting. Applies to Linear Encoder, Rotary Encoder or any kind of other Incremental Digital Devices, and produces a measure with no attribute, that can overflow.

Parameter	Meaning
Connection Type	 **Quadrature:** Phase-A and Phase-B in quadrature **Phase A+:** Phase-A only incrementing counting Phase-B not cared **Phase B+:** Phase-B only decrementing counting Phase-A not cared **Phase A+ Phase B-:** Phase-A incrementing counting Phase-B decrementing counting **Phase A+/- Phase B Dir:** Phase-A incrementing/decrementing counting function of Phase-B level
	 **x1:** Division none **x2:** Division half step **x4:** Division quarter step
	 **Differential TTL:** Differential signals with TTL levels. **Single Ended TTL:** Single Ended signals with TTL levels. **Complementary HTL:** Complementary signals with HTL levels. **Single Ended HTL:** Single Ended signals with HTL levels.
Step (Linear mode only)	 **Encoder Step [µm], default 1 [µm]:** measure resolution is self-adjusted by Unit elaborating this value.
Line Count (Rotary and Perio-duc modes only)	 **Encoder Impulses/Round , default 3600:** measure resolution is self-adjusted by Unit elaborating this value.

Parameter	Meaning
Frequency Max	  Encoder/Counter **Maximum Frequency** [kHz], default disabled.Maximum Frequency of Input Signal parameter optionally specifies maximum operating frequency of Incremental Digital Encoder or other Incremental Digital Device: • Maximum Speed [mm/s] / Step [mm/1000] for Linear Encoder, metric system • Maximum Speed [inch/s] / Step [inch/1000] for Linear Encoder, imperial system • Maximum Speed [RPM] / 60000 * Step [Impulses/Round] for Rotary Encoder If enabled , Maximum Frequency of Input Signal parameter restricts allowed input frequencies: **1)** On single Phase-A,B signals, transitions above programmed frequency are filtered. **2)** On both Phase-A,B signals, concurrent transitions above programmed frequency are detected and notified via <Over Speed> alarm. So Maximum Frequency of Input Signal parameter optionally let filter spikes on single phase and detect over-speed conditions.
Marker	**Marker** signal present - ON Phase-M provided - OFF Phase-M not provided If Phase-M (Marker) is declared as present, test on its proper connection is enabled. If Phase-M (Marker) is declared as present, it will be used for Marker cycles in order to calibrate and apply zeroing to system.
Alarm	**Alarm** signal present - ON Alarm provided - OFF Alarm not provided If Alarm is declared as present, test on its level is enabled: on error, alarm <Transducer Not Operative> is asserted.
HW Direction	**Direction** of counting - forward incrementing counting - backward decrementing counting

Button	Meaning
	Closes window without saving changes.
	Saves changes to Unit parameters. All data are downloaded directly to Unit. All data are uploaded directly from Unit again
	Aborts changes to Unit parameters. All data are uploaded from Network Unit again.

NOTE:
For all the error codes refer at the MDHQSPC software manual.

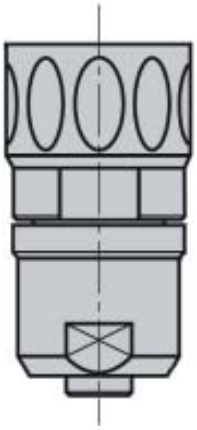
7.6 Technical specifications

INPUT	
Square wave signal connection.....	Single ended (A, B, Z, ER) or Differential (A+, A-, B+, B-, Z+, Z-, ER+,ER-)
Input signal type.....	TTL, HTL, RS422, push-pull, or open-collector
Input channel.....	In phase (A)
	In quadrature (B)
	Reference (Z)
	Error (ER)
Switching levels.....	(V+ is defined as the voltage of the terminals A+, B+ Z+, ER+)
	(V- is defined as the voltage of the terminals A-, B- Z-, ER-)
	(Vdiff is the differential voltage between the inputs V+ e V-)
Input type set as Differential.....	High when Vdiff > 0.6 V
	Low when Vdiff < -0.6 V
	(Vdiff is the differential voltage between the inputs V+ e V-)
Tipo di ingresso impostato su Single Ended...	High when V+ input >2.4 V
	Low when V+ input <1 V
Frequenza dei segnali di fase all'ingresso...	Maximum 3 MHz
Test sui segnali in ingresso.....	Alarm disconnect the cable (single cable) or short-circuit between V+ and V-. Over speed alarm Transducer failure alarm (if present in the encoder)

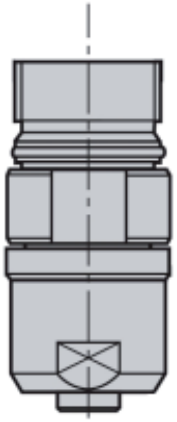
OUTPUT	
Digital Output.....	The “ei” module supplies as a digital output different measurement units (configurable via the module): mm or inch (linear), degrees (rotary), degrees [360° module] (periodic), numbers (counter).
	The digital output is compatible with the Marposs DigiCrown prro-tocol commands.
Sampling frequency.....	Up to 4000 samples/second
Number of samples buffered.....	maximumu 6200
COUNTER	
Counter dimensions.....	32 bit
Counter modes.....	In quadrature Bi-directional counter Mono-directional counter (programmable)
Interpolation.....	X1, X2, X4 (programmable)
ENVIRONMENTAL PARAMETERS	
Storing temperature.....	-20°C to +70°C
Operating temperature.....	0°C to +60°C
Protection degree.....	IP43
ELECTRIC INTERFACE	
Encoder supply voltage and maximum current...	5.1Vdc (+/-4%) max 500mA
Supply voltage of the box.....	7,5Vdc (-10% + 30%) da from DigiCrown bus
Supply current of the box.....	100mA (excluding the current consumption of the connected sensor)
Digital interface.....	DigiCrown maximum Baud rate 2083Kpbs
Connector.....	9 D-sub male

7.7 Heidenhain extensions

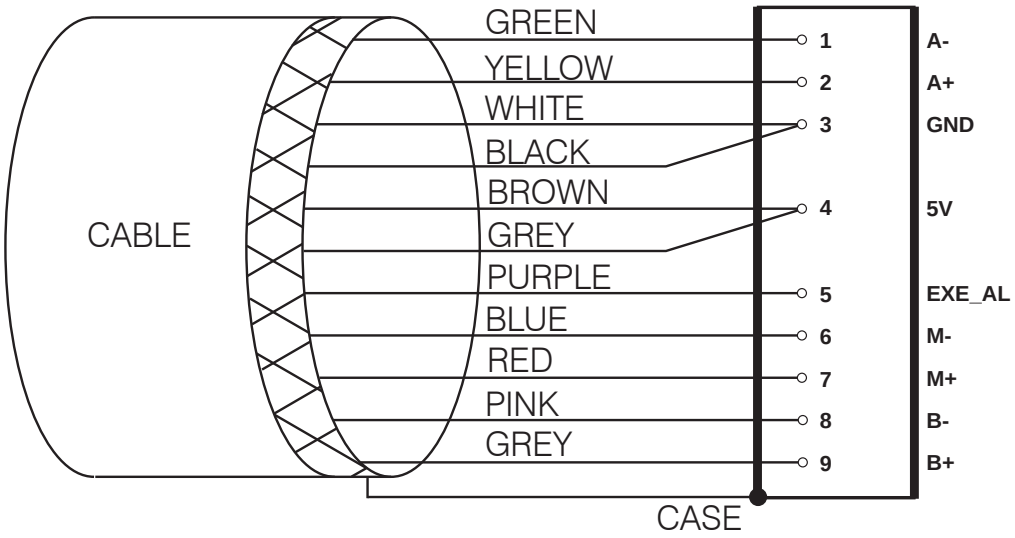
WITH RING NUT	
DESCRIPTION	**ORDER CODES**
PROL.X HEIDENHAIN 12S GH. EMI 0.5MT	**6739957016**
PROL.X HEIDENHAIN 12S GH. EMI 2MT	**6739957020**
PROL.X HEIDENHAIN 12S GH. EMI 5MT	**6739957017**
PROL.X HEIDENHAIN 12S GH. EMI 10MT	**6739957018**
PROL.X HEIDENHAIN 12S GH. EMI 15MT	**6739957010**
PROL.X HEIDENHAIN 12S GH. EMI 20MT	**6739957019**



WITHOUT RING NUT	
DESCRIPTION	**ORDER CODES**
PROL.X HEIDENHAIN 12S EMI 0.5MT	**6739957015**
PROL.X HEIDENHAIN 12S EMI 1.5MT	**6739957021**
PROL.X HEIDENHAIN 12S EMI 3MT	**6739957024**
PROL.X HEIDENHAIN 12S EMI 5MT	**6739957012**
PROL.X HEIDENHAIN 12S EMI 10MT	**6739957013**
PROL.X HEIDENHAIN 12S EMI 15MT	**6739957005**
PROL.X HEIDENHAIN 12S EMI 20MT	**6739957014**



7.8 Electrical wiring 12 pins connector of the extension



For other connection needs, please contact Marposs.

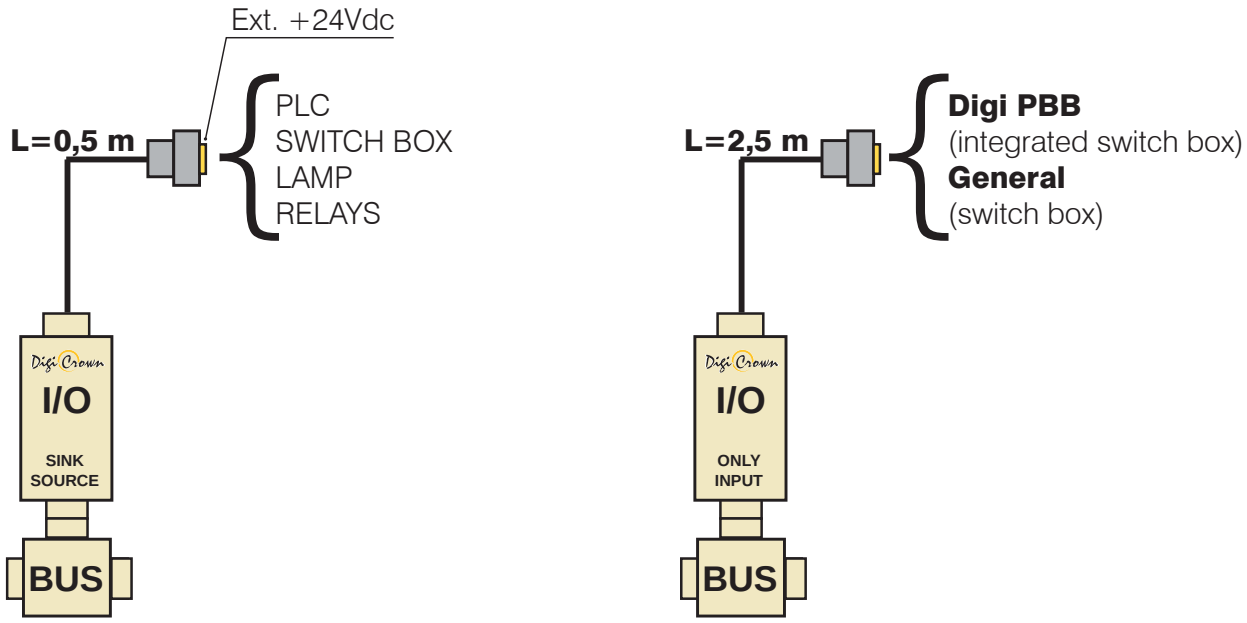
8 DIGICROWN BOX(C) I/O

8.1 Application notes

The **I/O** module is used to manage digital input/output signals.
Typical applications for this device are management of lamp indications, solenoid valves (through power relays) or acquisition of input signals by local cycle START/STOP push-button panels, limit switches,etc.

Each **I/O** module can manage any combination of up to a maximum of 8 digital inputs/outputs (e.g.: 4 inputs + 4 outputs, 2 inputs + 6 outputs, etc.), using a 15-pin D-sub connector.
The system limit is 32 **I/O** modules (total = 256 inputs/outputs).

This device is available in *SINK, SOURCE* and *SINK ONLY INPUT* versions, to guarantee maximum flexibility for use according to the application to be managed.

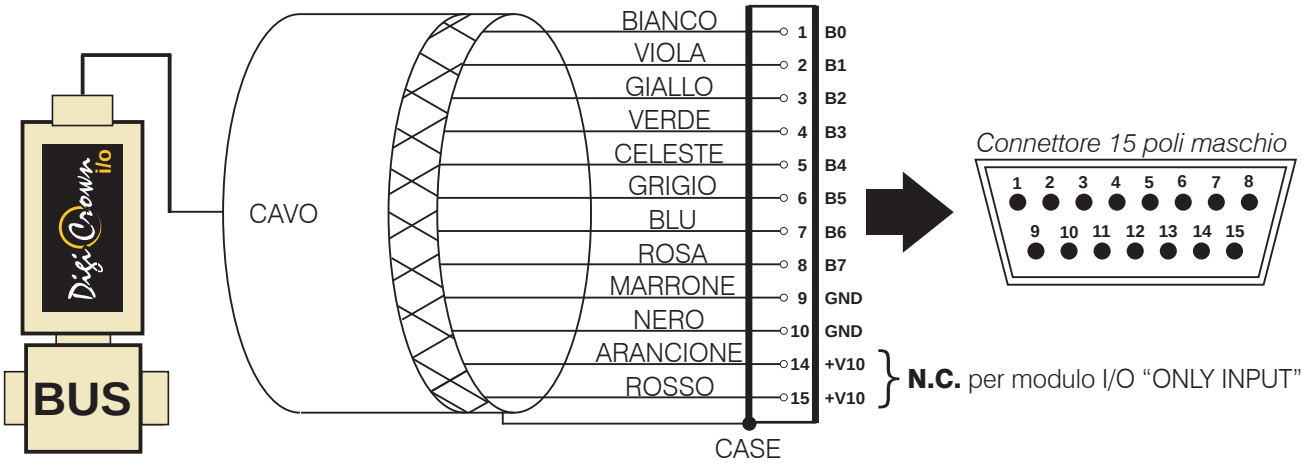


The **I/O** module is mounted on the *DigiCrown* **bus** unit, which is used for communication with the data acquisition system with a standard RS-485 serial connection.

A 9-pin D-sub connector is used for the connection to the **bus** module and also supplies electrical power to the control part and, in the case of the ONLY INPUT module, to the interface part.

Each **I/O** module also incorporates a LED for a rapid diagnosis of the unit's operating status

8.2 Electrical connections



Pins 1 - 8 of the 15-pin male D-sub connector are used to connect the **I/O** module to external signals.

Pins 9 - 10 and 14 - 15 are used to supply the 24V dc to the interface part. The electrical power supply is divided over four pins to guarantee an optimum current flow. To avoid overloads on the wires the 24V dc must be wired on all four pins.

The power supply voltage on the 15-pin D-sub connector must be of the **SELV** type and isolated from the bus voltage.

NOTE:
For the "ONLY INPUT" **I/O** module the electrical connections are the same, except there is no 24V dc power supply. Therefore, pins 14 and 15 are not connected.

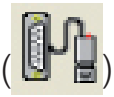
8.3 Input/Output configuration

To configure the inputs/outputs on the DigiCrown **I/O** module you must install one of the following pieces of software: *QSPC, Easy Acquisition* or *Marposs Driver Library.*

Below are the basic steps for **I/O** module set-up.
For further information about the MDHQSPC driver, consult manual available on our web site: www.testar.com.

8.3.1 Off-Line mode

1. Create a new NET by selecting the type of interface with the management PC: **isa**, **pci card** or **232/USB** module.

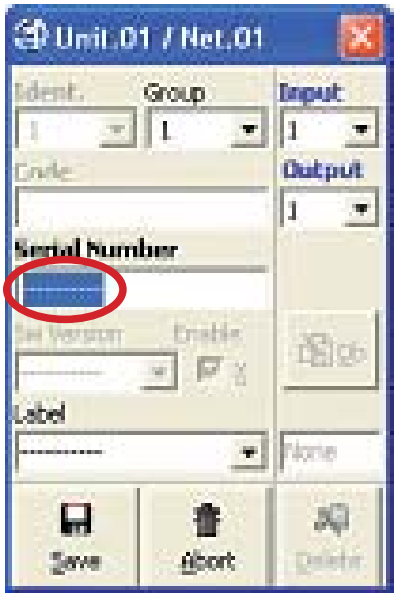
2. Select the **I/O** unit by clicking on the relative button (), and press *"Insert"* to insert the **I/O** modules present in the NET.

3. Finally, press "*Save*" to save the current NET, and "*Apply*" to activate the configuration.

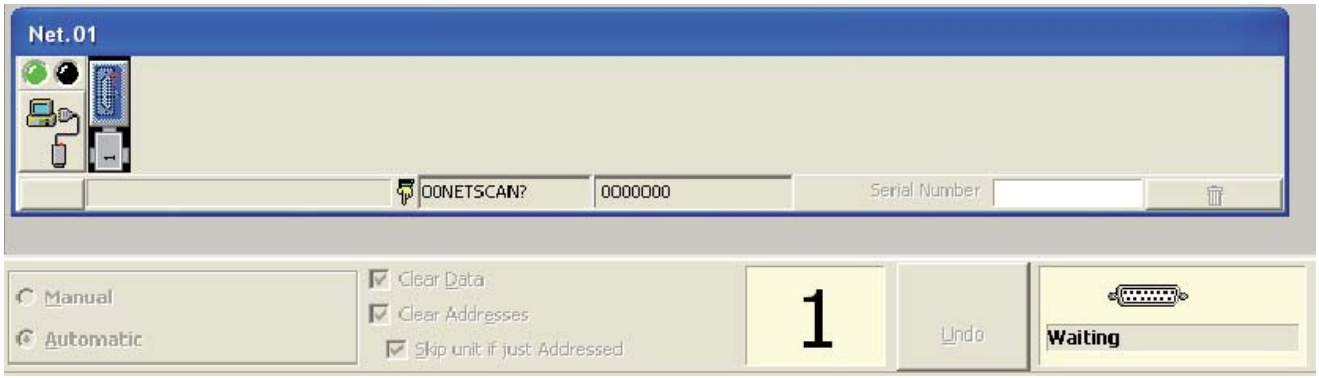
8.3.2 Addressing Mode

1. Click on the "*Addressing ON/OFF*" button ().
2. Press "*OK*" ().
   N.B.: the addressing procedure for the I/O modules is the same in both "*Automatic*" and "*Manual*" modes.

3. Type in the serial number of the **I/O** module and press "*Save*".



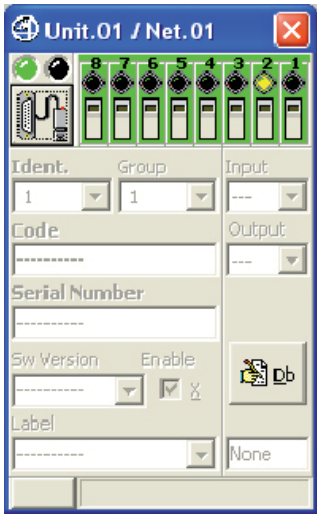
4. Alternatively, you can set the address for the module by physically changing the status of an input; usually: press a cycle *START/STOP* button, activate a limit switch contact, etc.



8.3.3 On-Line mode

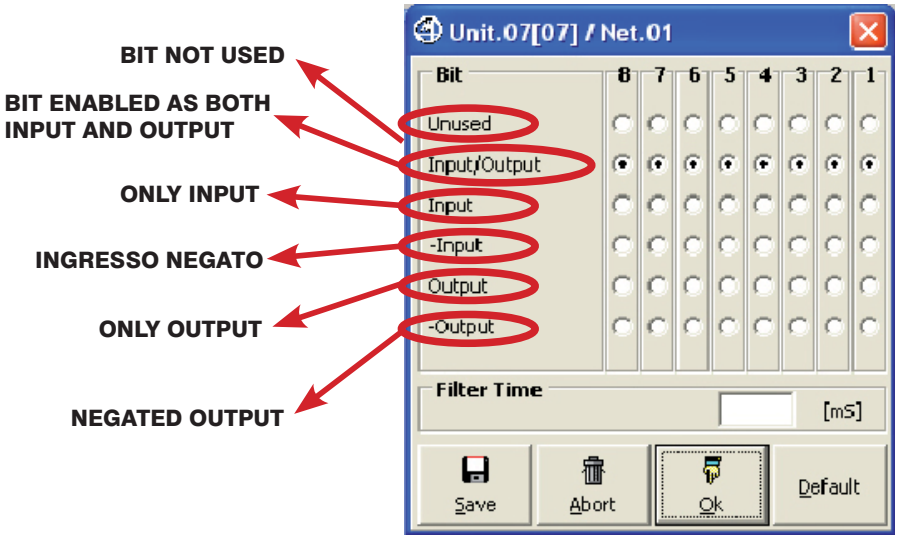
1. Go to the on-line step by clicking on this button:  .

2. Open the window below by clicking on the first **I/O** module to be configured:  .



3. Press the "*Db*" button:  .

4. Configure the **I/O** module's digital inputs/outputs using the window shown below. By default all bits are enabled as "Input/Output".



5. Press  to save the settings to the **I/O** module memory.

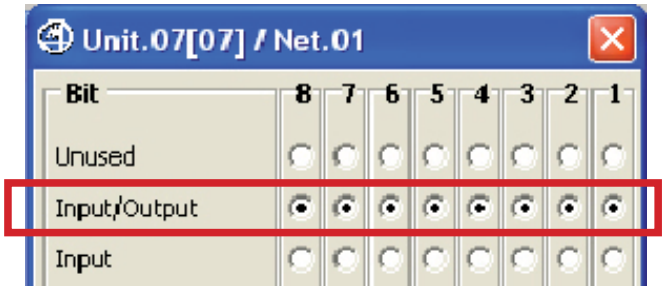
6. Finally, close the window by pressing:  .

7. Repeat steps 2 to 6 for all of the other **I/O** modules in the NET.

8.3.4 Flow-Control Application

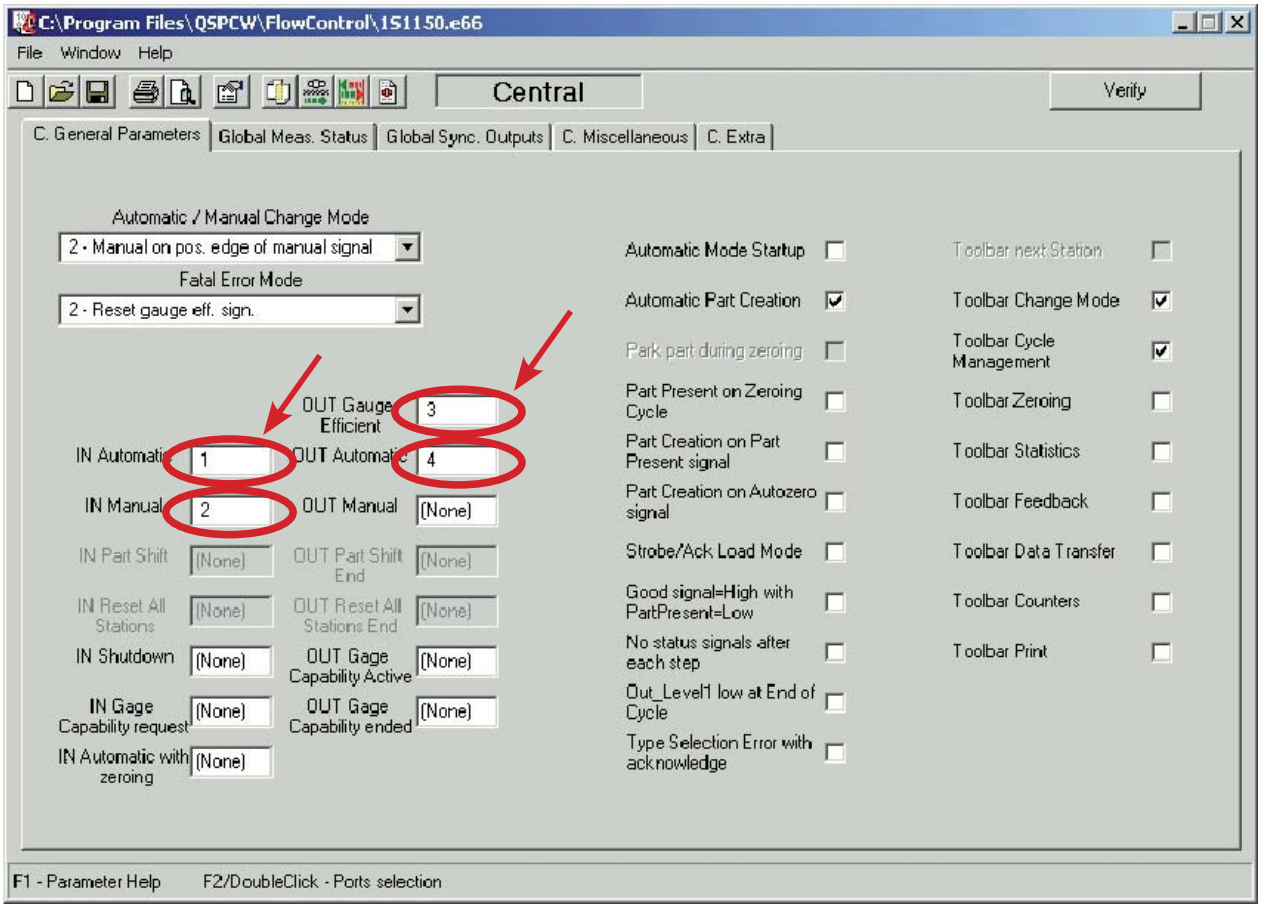
The digital input/output driver interfaces with the Marposs data processing software (*QSPC, Easy Acquisition…*) using the **Flow-Control** application.

This application allows a specific function to be associated with each digital signal arriving from the **I/O** module. To avoid conflicts with the DigiCrown **I/O** module configuration driver, set each bit to “Input/Output” (see image below).



In this way assignment of the digital inputs/outputs of each bit will be managed completely by the *Flow-Control* application (see example below).

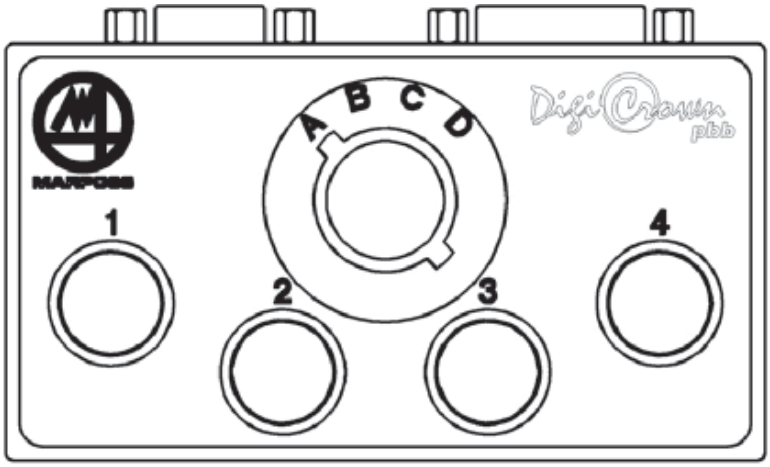
If there are two or more modules in the NET, the bits are numbered sequentially: module 1 (bits 1 - 8), module 2 (bits 9 - 16), module 3 (bits 17 - 24), etc.



8.4 DigiCrown “PBB” push button

The *DigiCrown* **pbb** push button implements the **I/O** unit, allowing to control eight digital inputs by means of ON/OFF buttons and a four positions selector.
Typically the buttons are used for START/STOP sequences and data acquisitions, while the selector for setting a different working piece to be measured.
Besides the 15-pin female D-sub port used for connecting the **I/O** (ONLY INPUT) module, the push button includes a 9-pin female connector for linking an external footswitch.

It follows the frontal view of the *Digi* **pbb** push button with the relevant digital bit associated to each switch.



- Button 1 = *bit 0*
- Button 2 = *bit 1*
- Button 3 = *bit 2*
- Button 4 = *bit 3*
- Selector position A = *bit 7*
- Selector position B = *bit 6*
- Selector position C = *bit 5*
- Selector position D = *bit 4* (*)

(*) The bit 4 reserved to the “D” position of the selector, it’s automatically assigned to the footswitch by unscrewing the 9-pin male connector.

The following MARPOSS *footswitches* are compatible with the push button:
- Quick Read footswitch (code **6738099030**)
- E4N footswitch (code **6738099015**)
- E9066 footswitch (code **6131600810**) – the adapter (code **4701300042**) is required.

8.5 Technical specifications

DigiCrown **I/O** (**SINK** version) / code **767I000000**	
Power supply (bus)	+7,5Vdc (-10% + 30%)
Current absorption (bus)	40mA
Power supply (V I/O)	24Vdc (± 20%)
Current absorption (I/O)	15mA (no output active)
I/O size	8 input and/or output bits, optoisolated, individually selectable
Input specifications	Voff (min): V I/O - 5V; Von (max): V I/O - 15V
OUT capacity	200mA (per OUT) - outputs total max. current: 800mA (temp.=0 to +50°C) - outputs total max. current: 700mA (temp.=0 to +60°C)
I/O protection	power supply inversion, output overload

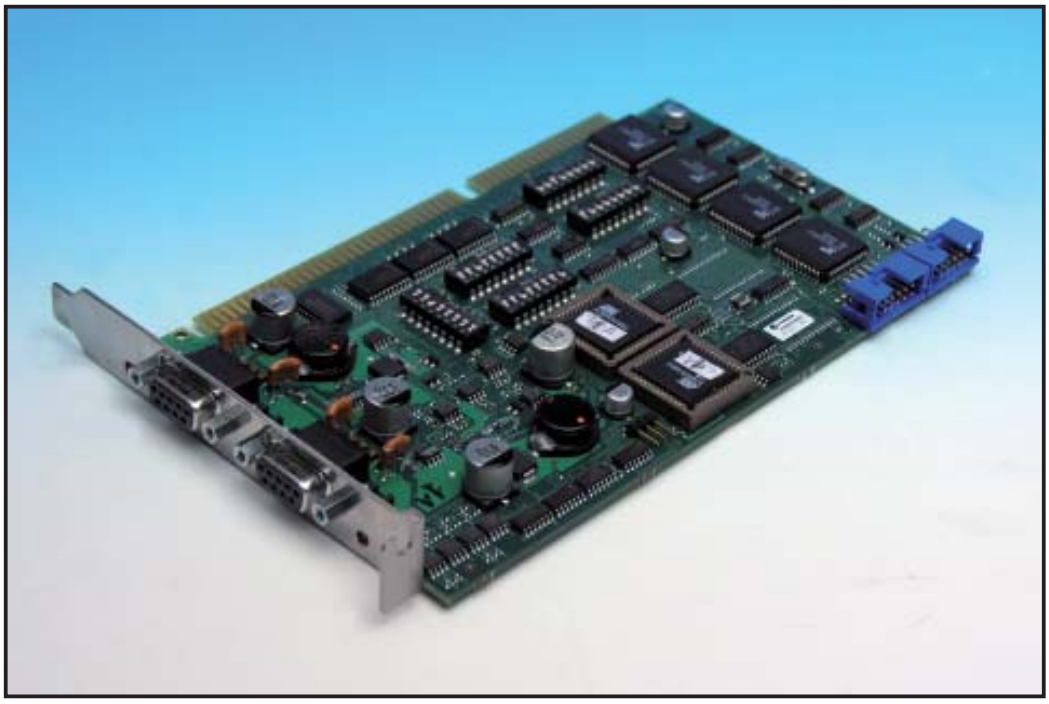
DigiCrown **I/O** (**SOURCE** version) / code **767I010000**	
Power supply (bus)	+7,5Vdc (-10% + 30%)
Current absorption (bus)	40mA
Power supply (V I/O)	24Vdc (± 20%)
Current absorption (I/O)	25mA (no output active)
I/O size	8 input and/or output bits, optoisolated, individually selectable
Input specifications	Voff (max): 5V; Von (min): 15V
OUT capacity	200mA (per OUT) - outputs total max. current: 800mA (temp = 0 to +50°C) - outputs total max. current: 700mA (temp.= 0 to +60°C)
I/O protection	power supply inversion, output overload

DigiCrown **I/O** (**ONLY INPUT** version) / code **767I020000**	
Power supply (bus)	+7,5Vdc (-10% + 30%)
Current absorption (bus)	50mA (all inputs activated)
I/O size	8 input bits (not isolated)
Input specifications	OFF: Rswitch > 500 KΩ ON: Rswitch < 3300 Ω

CAUTION:
Use a SELV power source (as defined by EN60950)

9 ISA CARD

9.1 Application notes



The *DigiCrown* **isa** unit achieves the RS485 Half Duplex serial communication with the rest of the network. Each card is equipped with two serial ports, for the overall management of 31 + 31 sensors or I/O modules.

Up to 4 cards can be interlinked (see paragraph 4.1), for the management of up to 8 networks (248 active units).

The LEDs next to the serial ports display the operating status of the card.

9.2 Before starting installation…

In order to ensure the correct operation of the **isa** card, a PC with the following minimum specifications is needed:

- One free ISA slot
- Microsoft Windows operating system (Windows 95, 98, 2000, NT, XP)

9.2.1 Installing the ISA card on a standard PC

Use the installation procedure described in the following chapter (CARD Setup). Windows provides a vast number of addresses for the system, we suggest using those indicated below, which should usually be included among the available resources.

Cards	COM	ADDRESS	IRQ
Card 1	COM **a**	0100	10
	COM **b**	0108	11
Card 2	COM **c**	0110	5
	COM **d**	0118	7

The most critical resource may be the interrupt value, especially in the case of two
cards. Therefore, in this case, interrupts 5 and 7 may be at risk. If so, it is best to disable the device that is not in use (for example the BIOS parallel port), and designate the required available interrupts as LEGACY ISA.

9.2.2 Installing the ISA card in a Marposs E9066N industrial PC

MARPOSS SpA supplies the ISA cards with a series of default address and interrupt settings, as indicated in the below table:

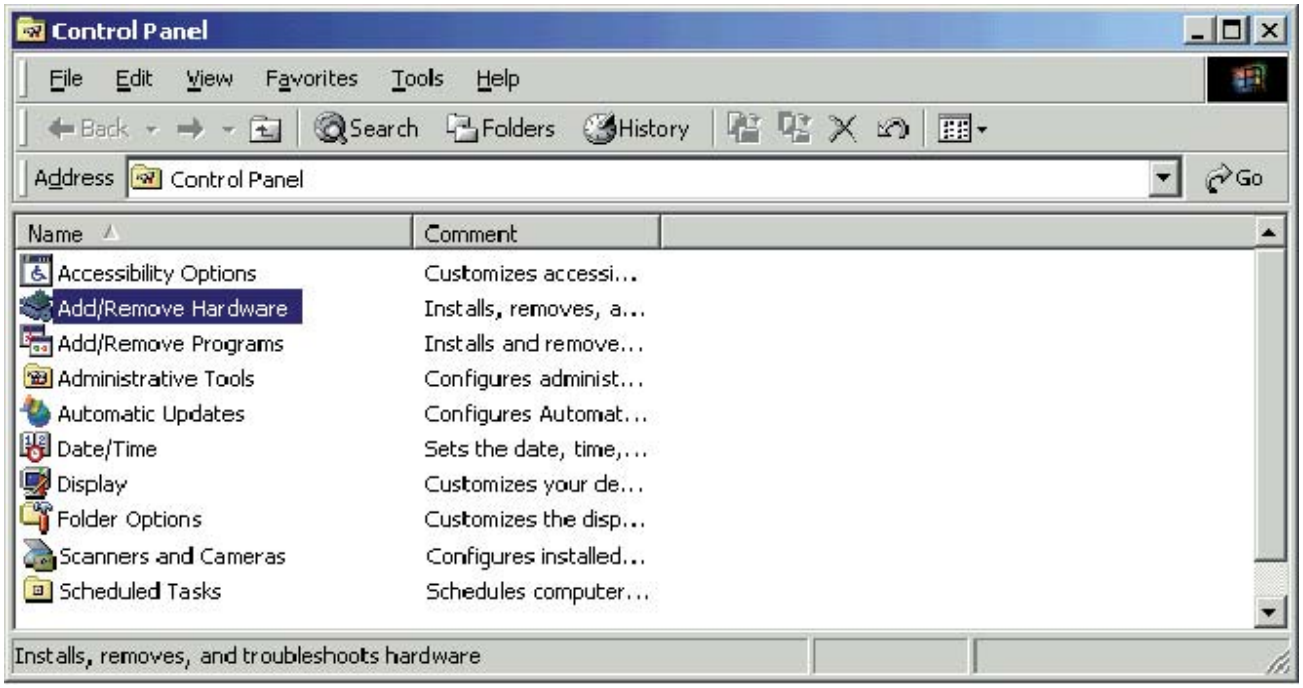
Cards	COM	ADDRESS	IRQ
Card 1	COM **a**	**(*)** 0100	**(*)** 10
	COM **b**	**(*)** 0108	**(*)** 11

To simply installation on Marposs Industrial PCs, the company supplies all E9066N systems with the following default BIOS settings:
interrupt 10 LEGACY ISA
interrupt 11 LEGACY ISA
As the addresses **0100** and **0108** are normally free, these pre-settings help to simplify the installation procedure (there is no need to move any jumpers on the card) and all the user has to do is select the suggested values **(*)** when carrying out the COM installation procedure on the E9066N (see chapter 3 CARD Setup).

9.3 Card setup

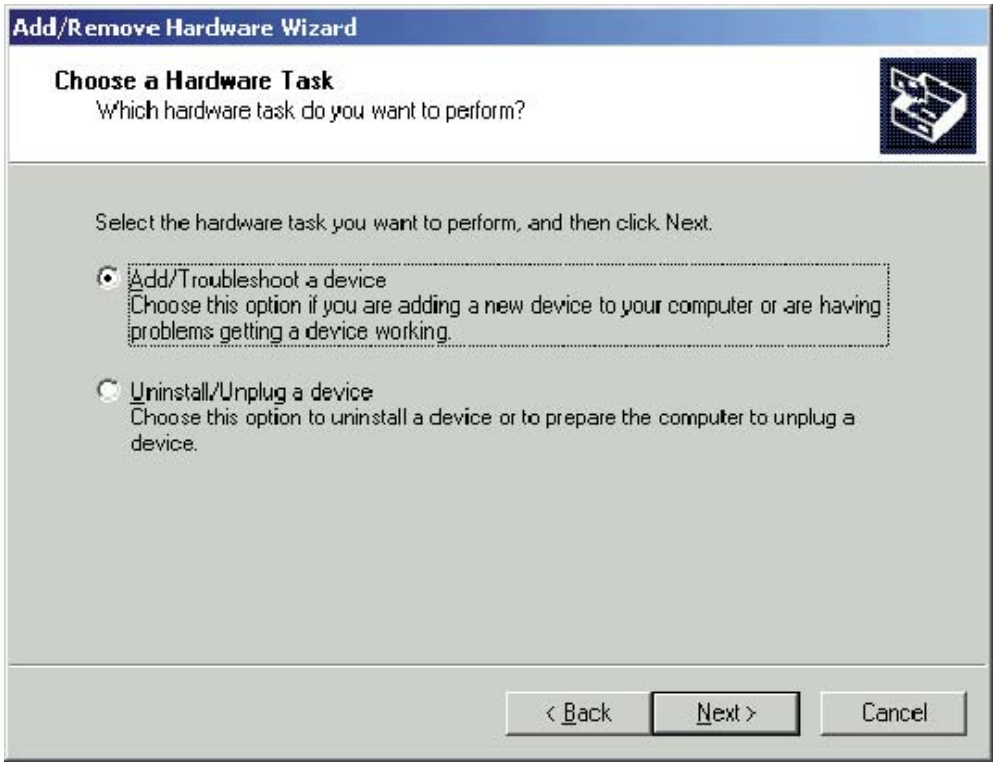
9.3.1 Setup of PC for housing the isa card

Click on "*Start*" ➔ "*Settings*" ➔ "*Control panel*"and double-click on "*Add/Remove Hardware*".

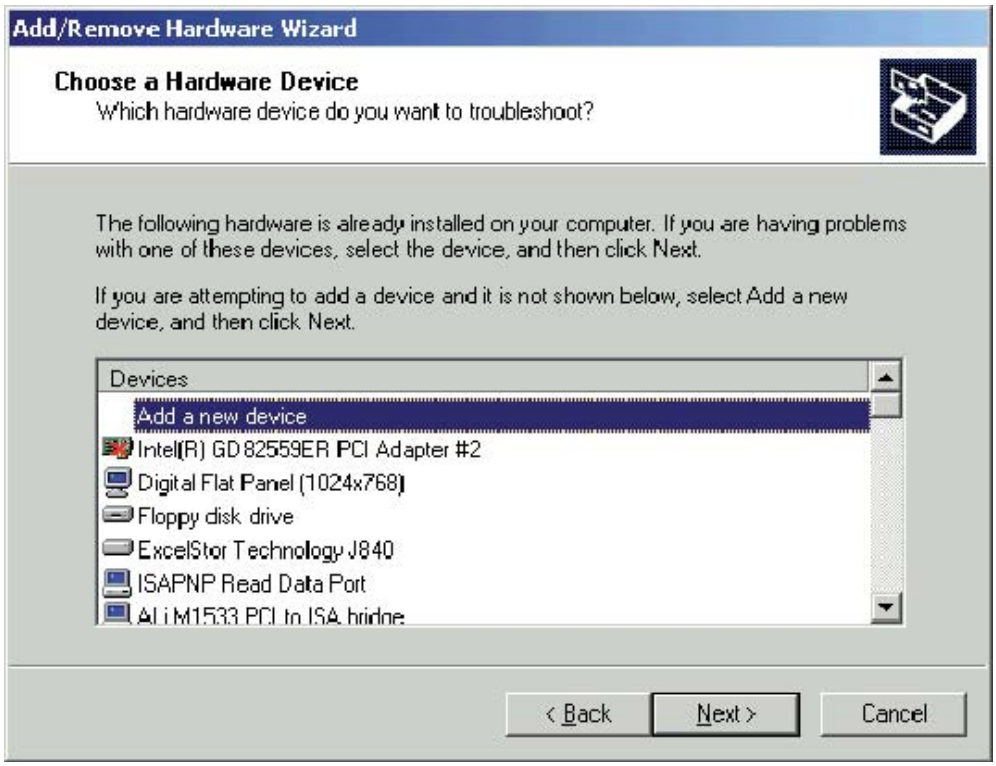


As soon as the window shown below appears, press the "*Next*" pushbutton.

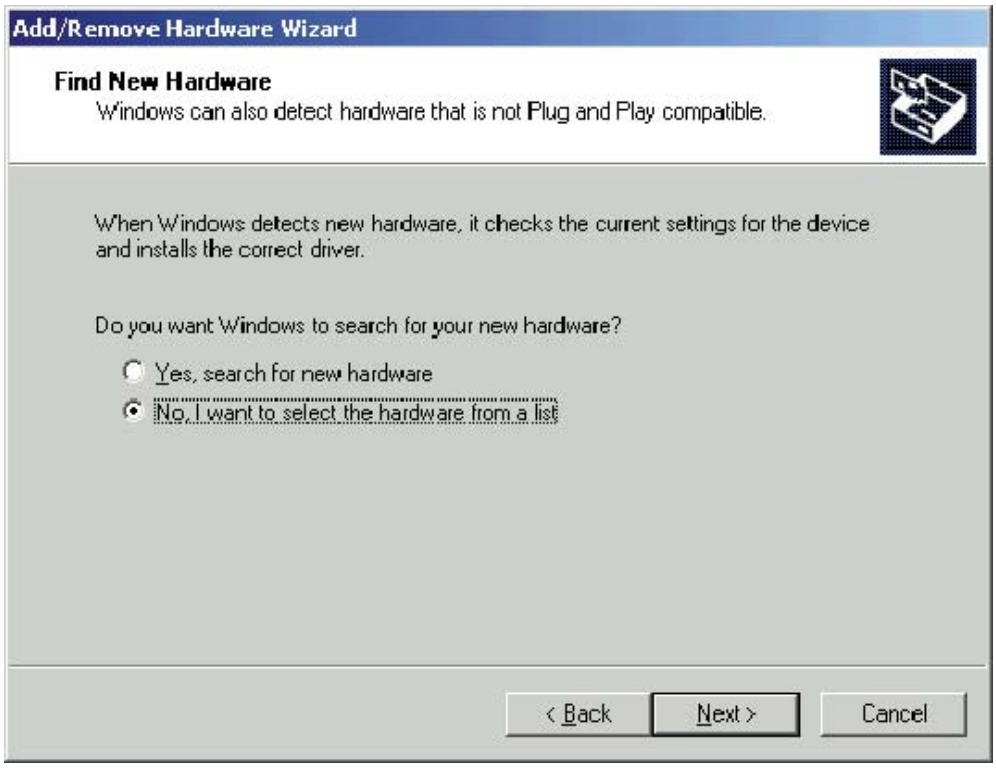
Select the "*Add a device*" option and press "*Next*"



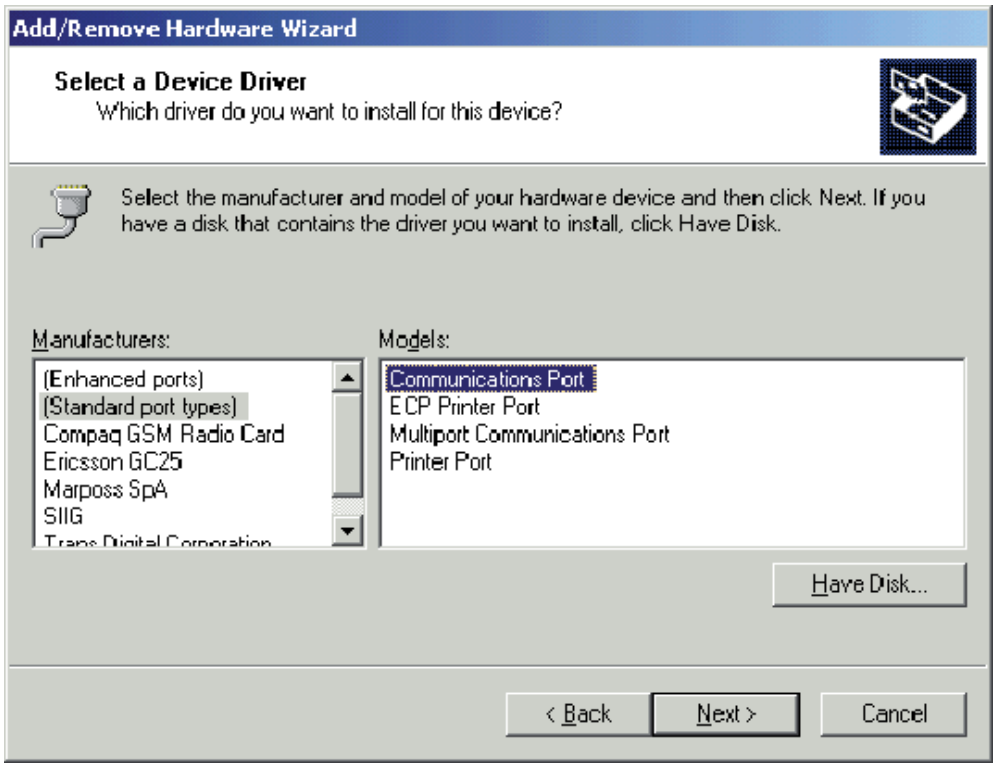
In the following window, select "*Add a new device*" in the list of devices, and press "*Next*".



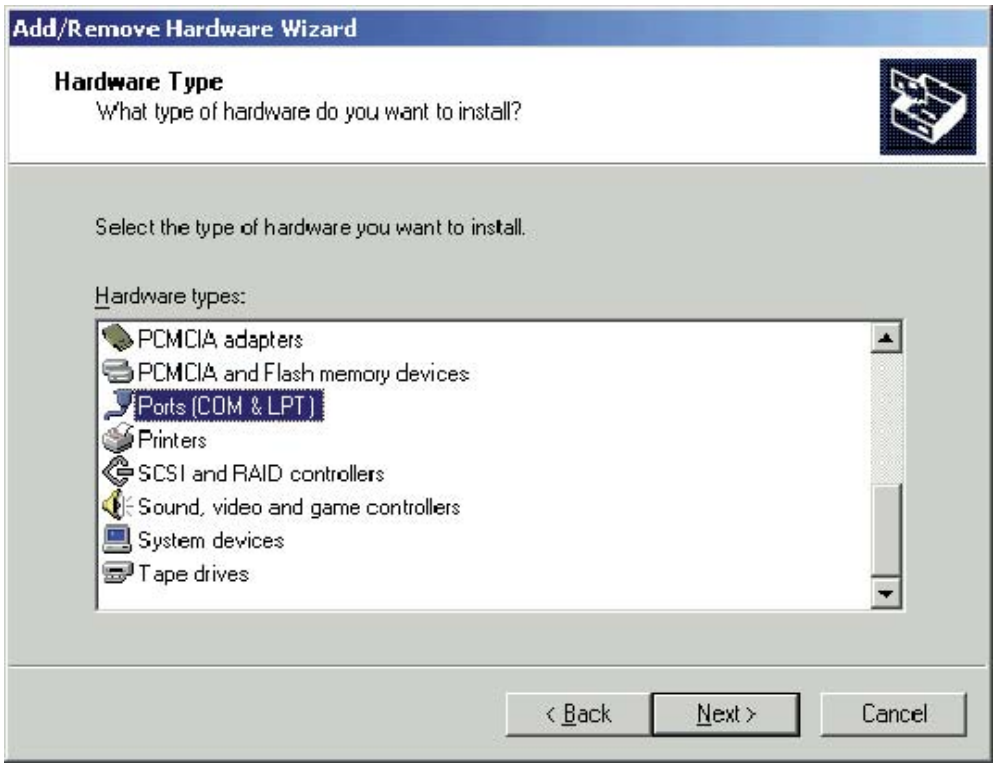
In the guided-procedure window, select the second option, "*No, I want to select the hardware from a list*" , then press "*Next*".



Select "*Standard port types*" in the list of manufacturers, and click on "*Communications port*" in the list of models. Press "*Next*" to pass to the following window.

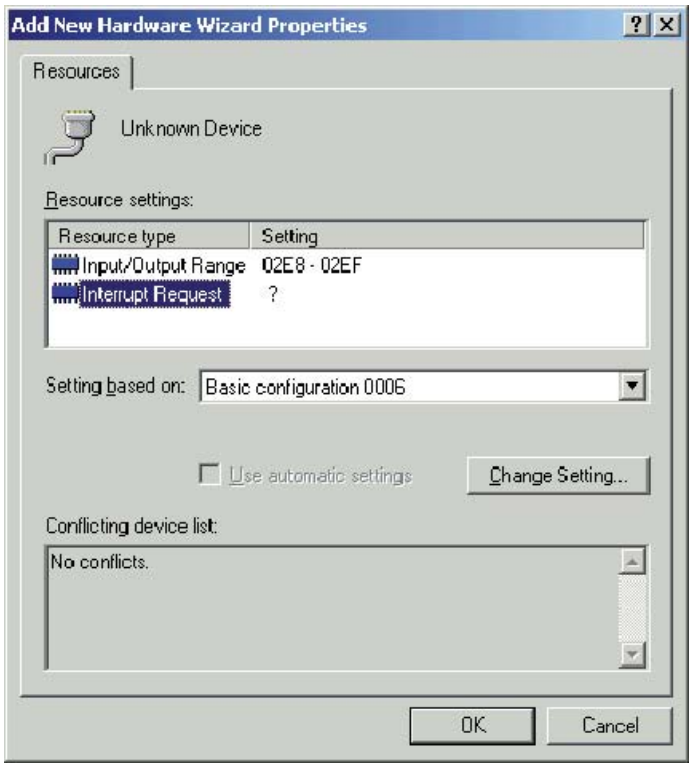


In the window shown below, select the option "*Ports (COM & LPT)*" , then press "*Next*".

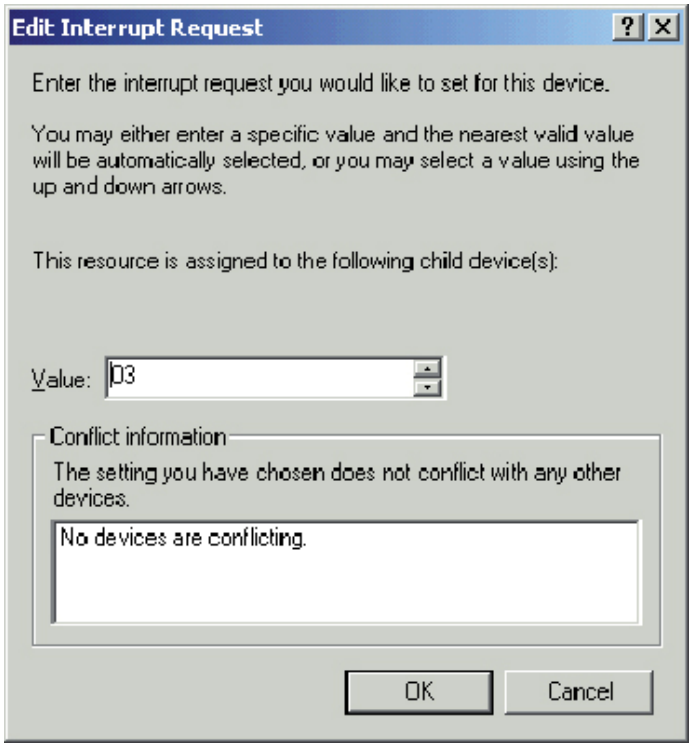


Should the warning message shown below appear, click on "*OK*".

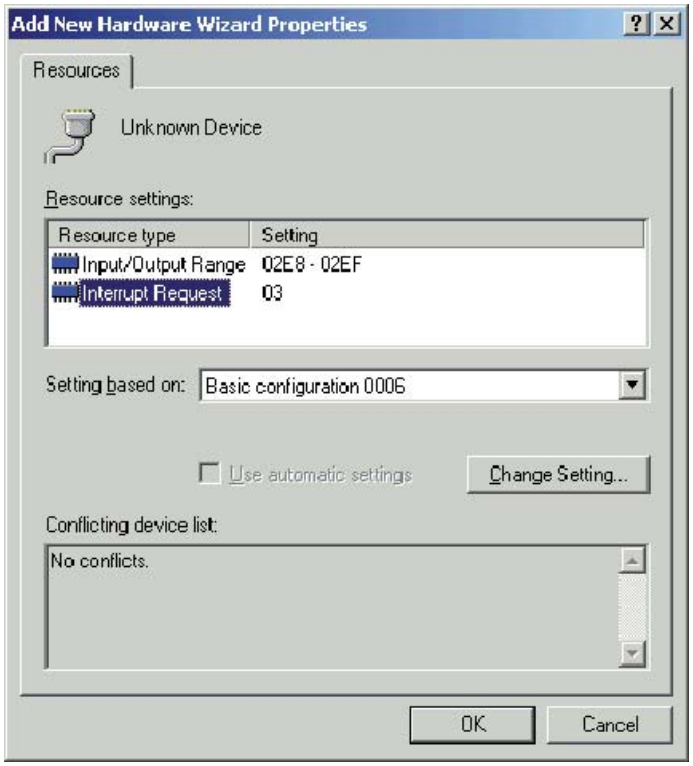
Set a basic configuration value that does not produce any conflict in the system, making sure that the "*No conflicts*" message appears in the "*Conflicting device list*" box (e.g. "*Basic configuration 0005*"). Then double-click on "*IRQ/Interrupt Request*".



Enter the interrupt-level value that you wish to set for the **isa** card (e.g. Value 03), making sure that there is no conflict. Press "*OK*" to confirm.



Write down the I/O interval value (e.g. 02E8-02EF) and the interrupt/IRQ value (e.g.03). Press "*OK*" to confirm.



Press "*Finish*" in order to complete the setup and switch the PC off.

NOTE: The operations described in para. 3.1 refer to the setup procedure for a single COM port. Repeat the same procedure for each additional COM port.

9.3.1 Programming the isa card “dip-switches”

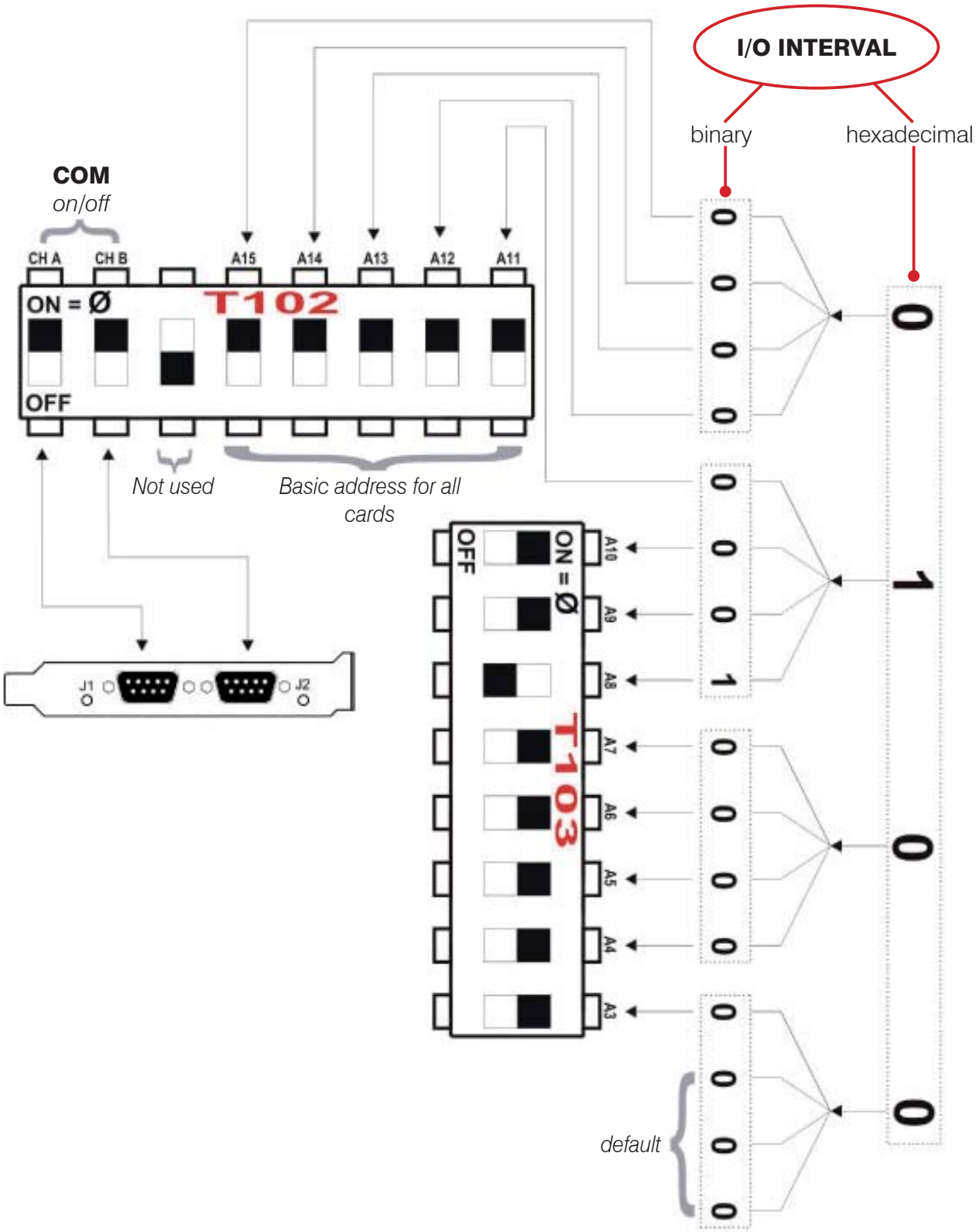
Once the card addressing procedure has been completed, it is necessary to define the following values by programming the dip-switches:

1. The I/O interval start value (e.g.: 0100).
   IMPORTANT: position ON = Ø.
   In this case, the following dip-switches are used:
   T102 and T103 ➔ COM a ➔ which communicates via connector J1
   T102 and T106 ➔ COM b ➔ which communicates via connector J2

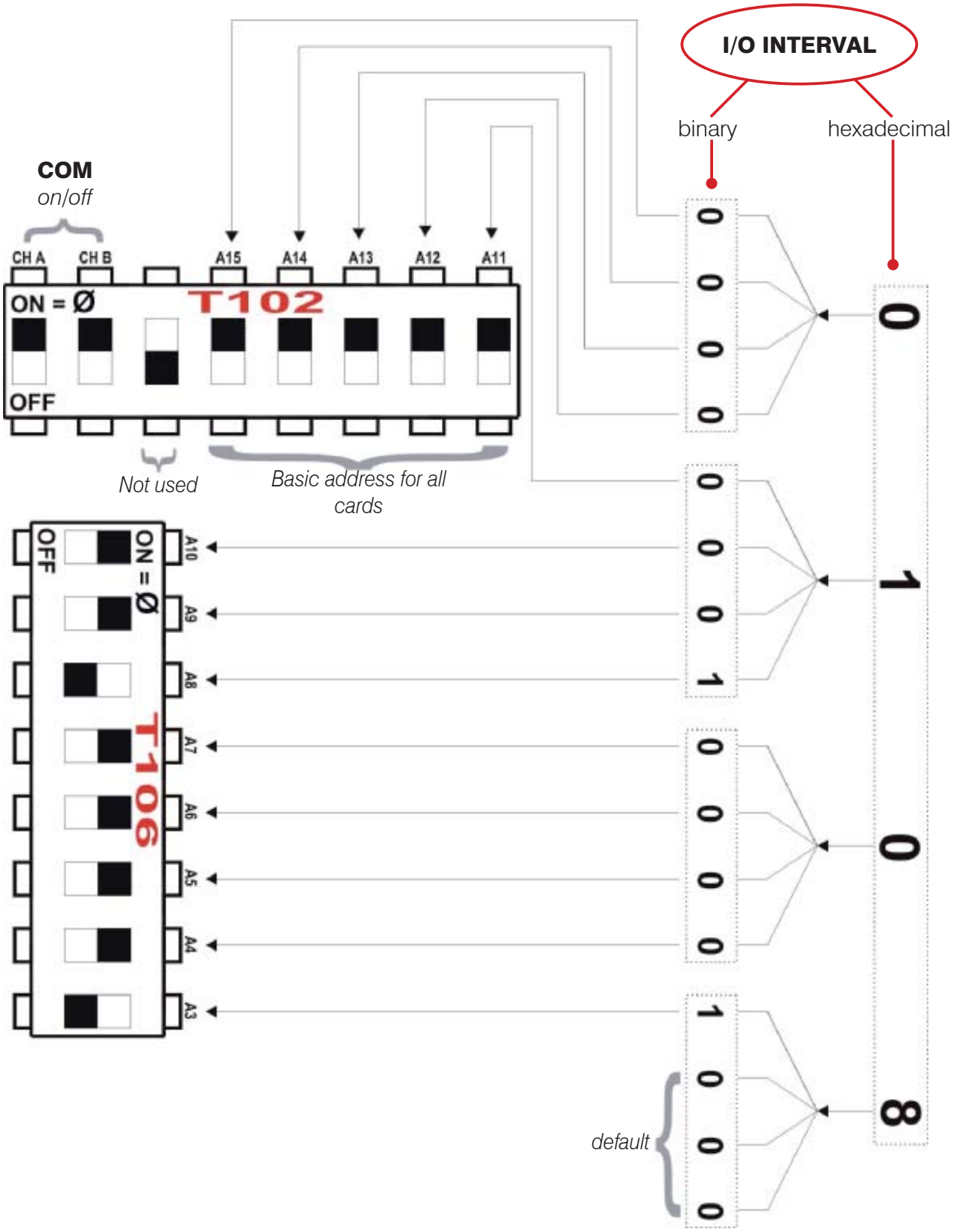
2. The interrupt value.
   IMPORTANT: to select the interrupt, set only the corresponding dip-switches to ON. All the other dip-switches must be set to OFF.
   In this case, the following dip-switches are used:
   T101 ➔ INTERRUPT CHA ➔ COM a (which communicates via connector J1)
   T104 ➔ INTERRUPT CHB ➔ COM b (which communicates via connector J2)

When setting the dip-switches it is important to bear in mind that each hexadecimal digit must be converted into 4 binary digits for use in the programming procedure illustrated in the diagram.

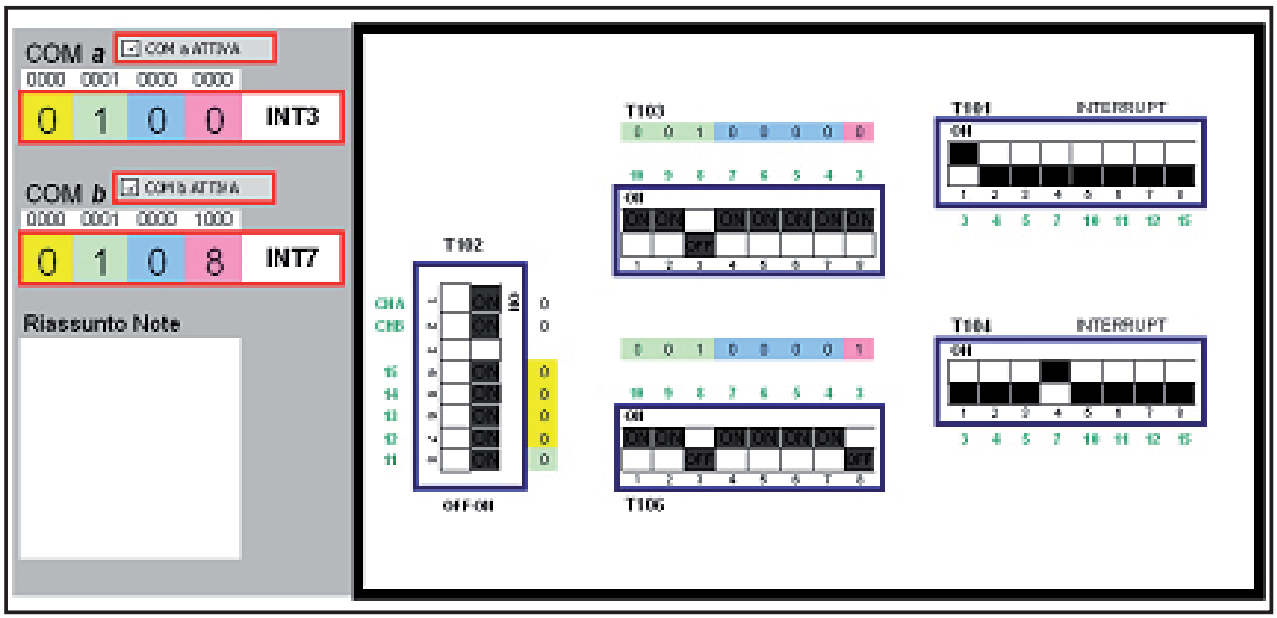
Programming dip-switches T102 / T103



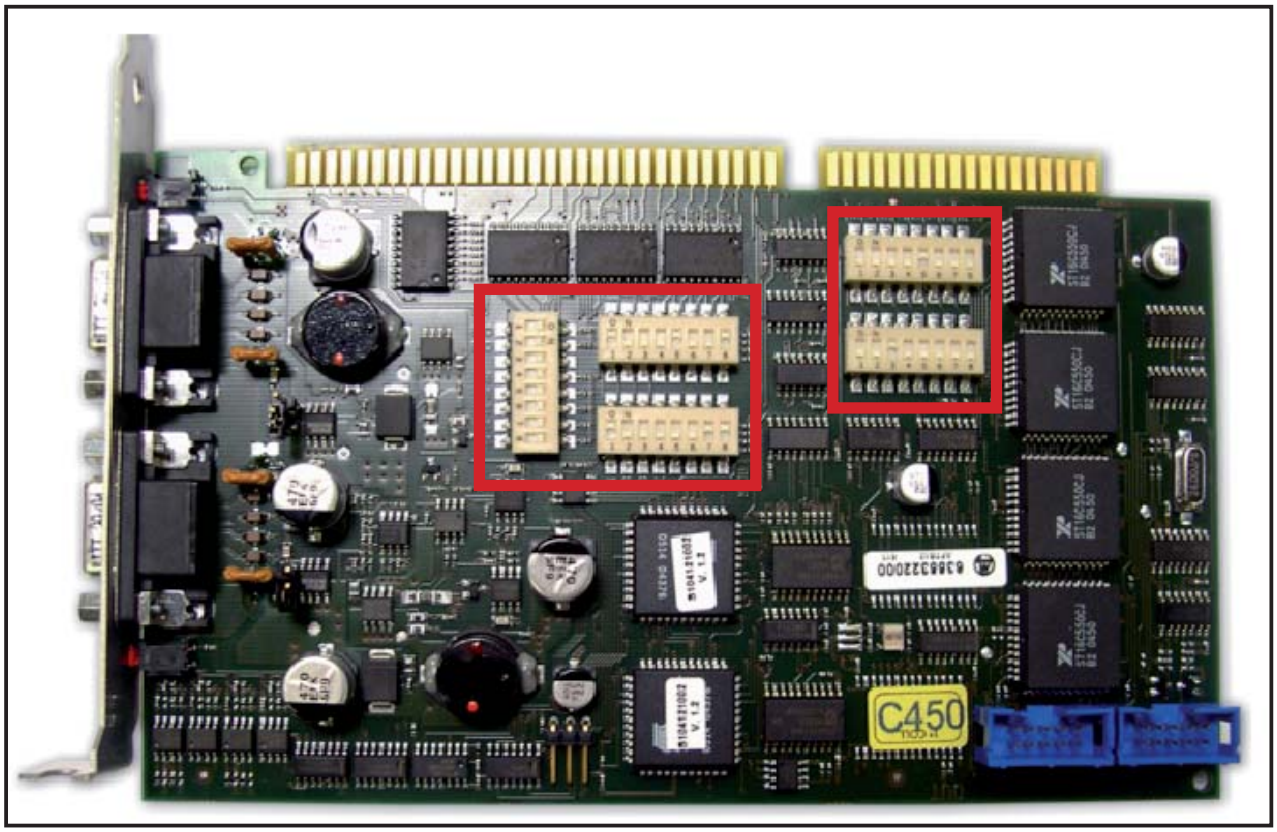
Programming dip-switches T102 / T106



In order to simplify this operation, and reduce the risk of errors to a minimum, a “CONFIGURATOR” is provided in Excel format that allows the user to define the position of the dip-switches graphically, based on the hexadecimal values defined using the Windows installation procedure.



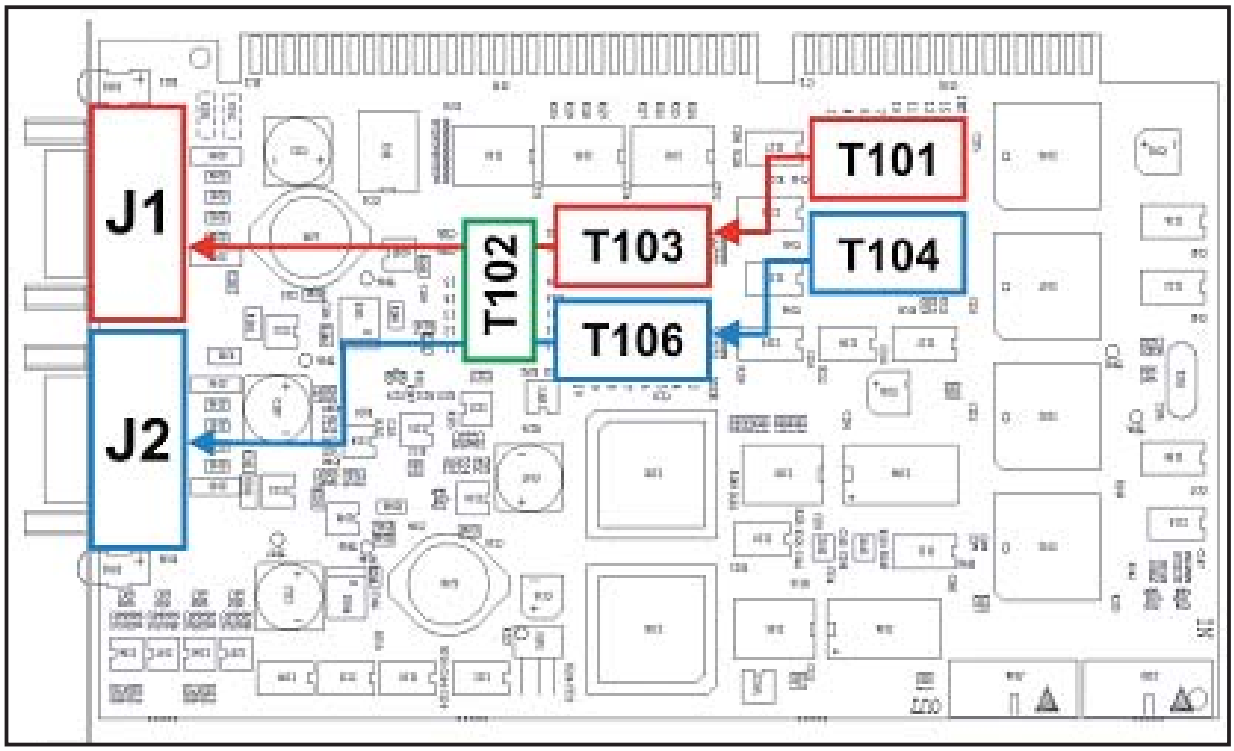
How to interpret the graphic configurator with reference to the card…



Relationship between Dip Switchs ➔ COM ➔ Board connectors

COM a ➔ INTERRUPT T101 ➔ T103 and T102 ➔ **J1**

COM b ➔ INTERRUPT T104 ➔ T106 and T102 ➔ **J2**



Summary of isa card dip-switch functions

- **T102 ➔** used for:
  - settings that are common to the two COM ports
  - basic addresses for all cards
  - enabling/disabling the COM a/b ports
  (serial connectors J1/J2)
  Dip-switch position ON (in the case of addresses: bit=0)
- **T103 ➔** sets the specific I/O addressing start value for the COM a identified as J1.
  Dip-switch position ON (in the case of addresses: bit=0)
- **T106 ➔** sets the specific I/O addressing start value for the COM a identified as J2.
  Dip-switch position ON (in the case of addresses: bit=0)
- **T101 ➔** sets the specific interrupt/IRQ value for the COM identified as J1.
  To enable the INTERRUPT value set the corresponding dip-switch to ON and all the others to OFF.

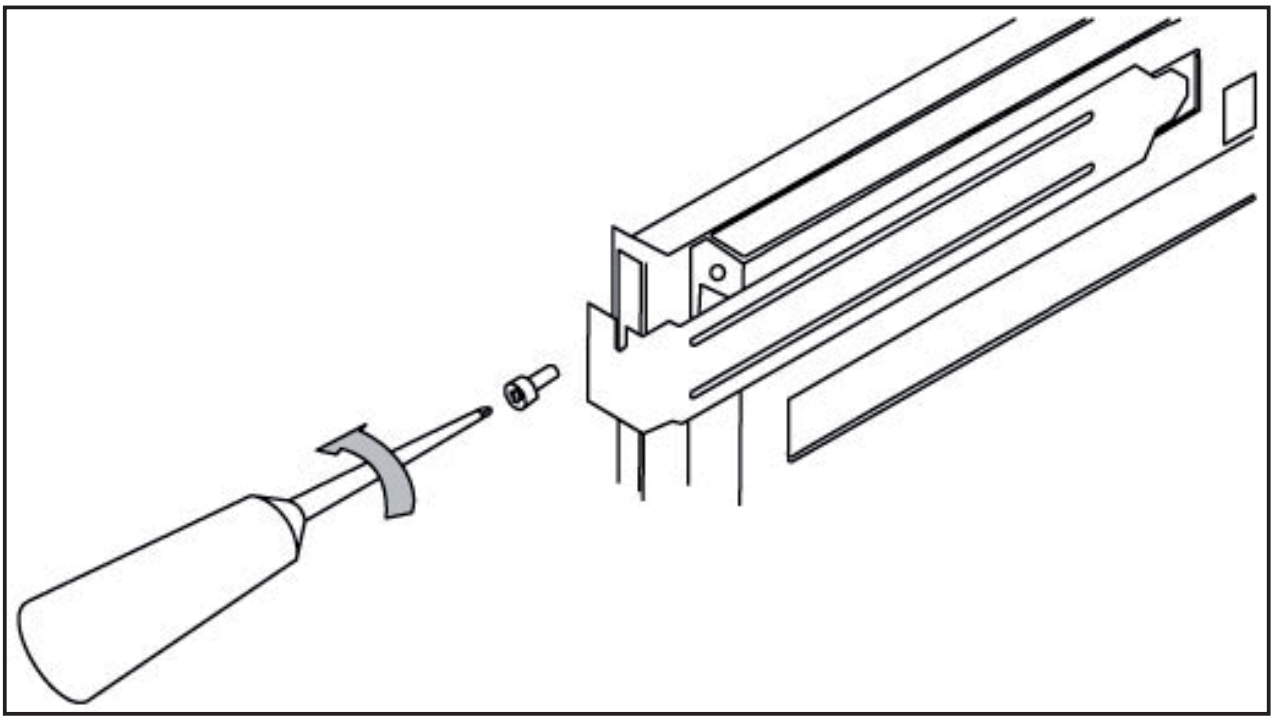
- **T104 ➔** sets the specific interrupt/IRQ value for the COM identified as J2. *To enable the INTERRUPT value set the corresponding dip-switch to ON and all the others to OFF.*

N.B.:

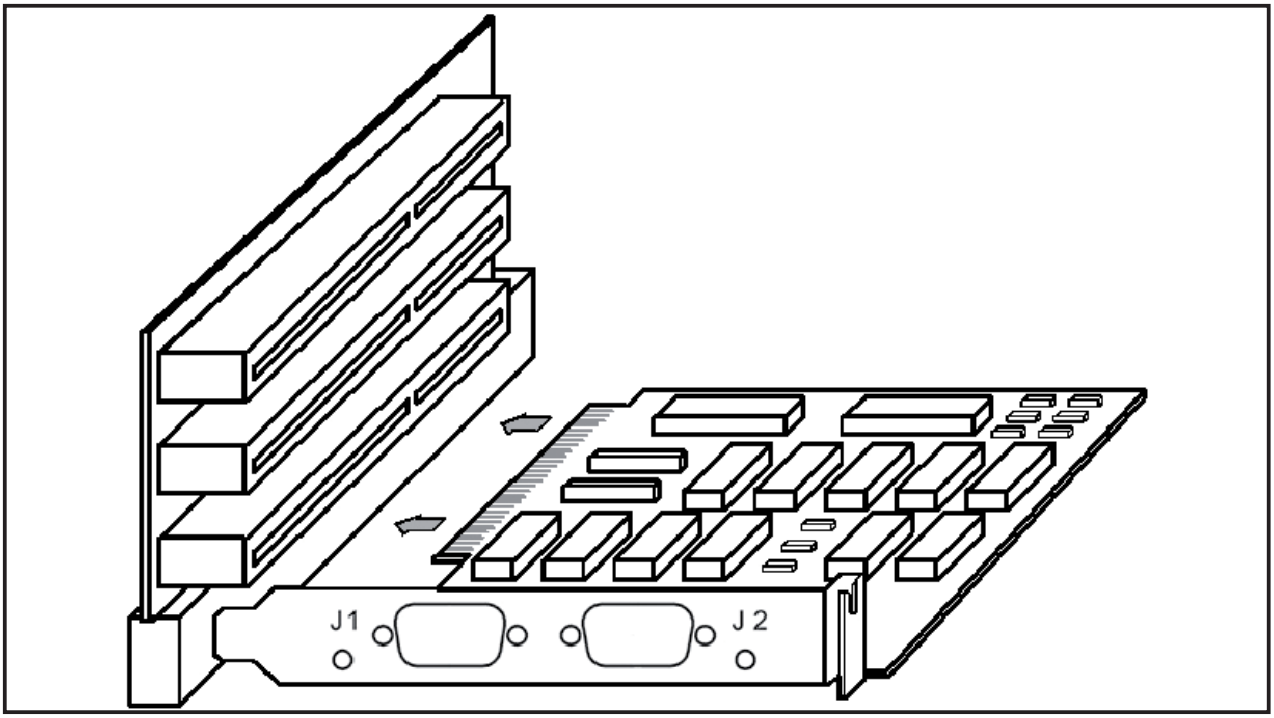
- T101 + T104 must not have the same interrupt enabled.
- If a COM (a or b) is disabled (by setting the corresponding position on T102), set all the corresponding INTERRUPT dip-switches to OFF in order to free this resource on the BUS and make it available to other devices.
  Example:
  COM a disabled
  T102 ➔ dip switch CHA set to OFF
  T101 ➔ all dip-switches set to OFF
  or
  COM b disabled
  T102 ➔ dip switch CHB set to OFF
  T104 ➔ all dip-switches set to OFF

9.4 Installation of ISA card in the pc

When you have completed the procedure for the configuration of the dip-switches of the **isa** card, install the device in the PC. Switch the computer off, and remove the frame and the metal cover that protects the slot.



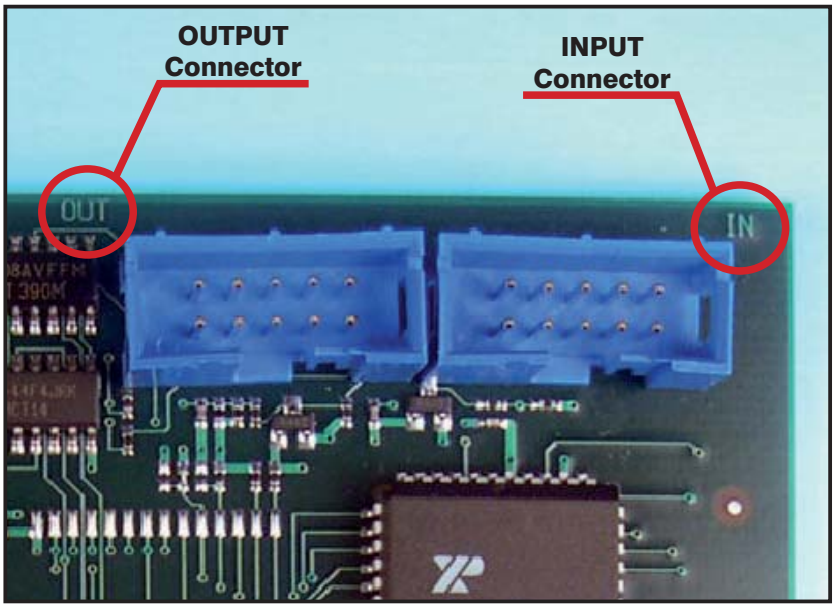
Insert the card in a free ISA slot.

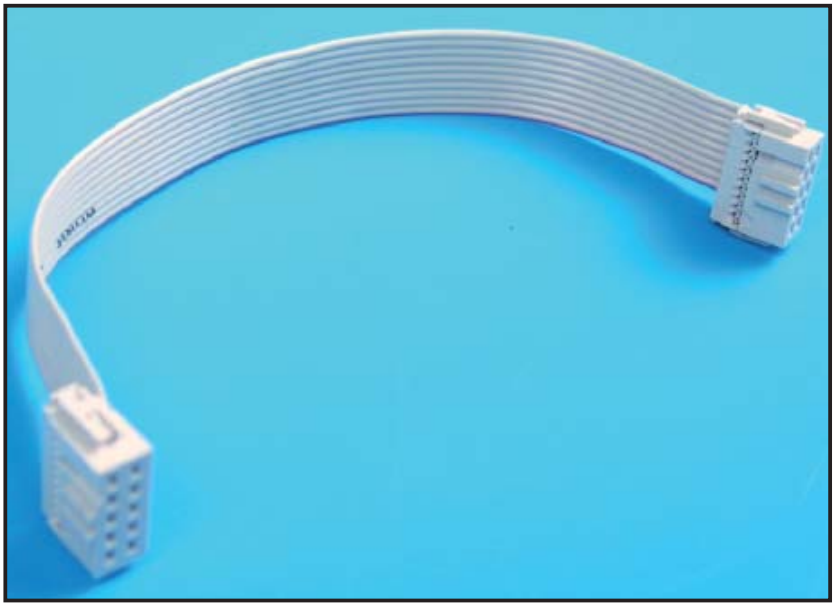


9.4.1 Synchronization of cards

The cards are interlinked by means of the OUT-IN connectors, using the 10-pins flat cable that is supplied. This connection extends the synchronization of the measurement reference frequencies between the various networks to up to 4 isa cards (=8 networks). An “isofrequency” system is thus obtained.

The flat cable must be connected to the OUT connector of a card, which becomes the master one, and to the IN connector of the next card. If further cards are present, the OUT connector is connected to the IN connector of the third one, and so on.

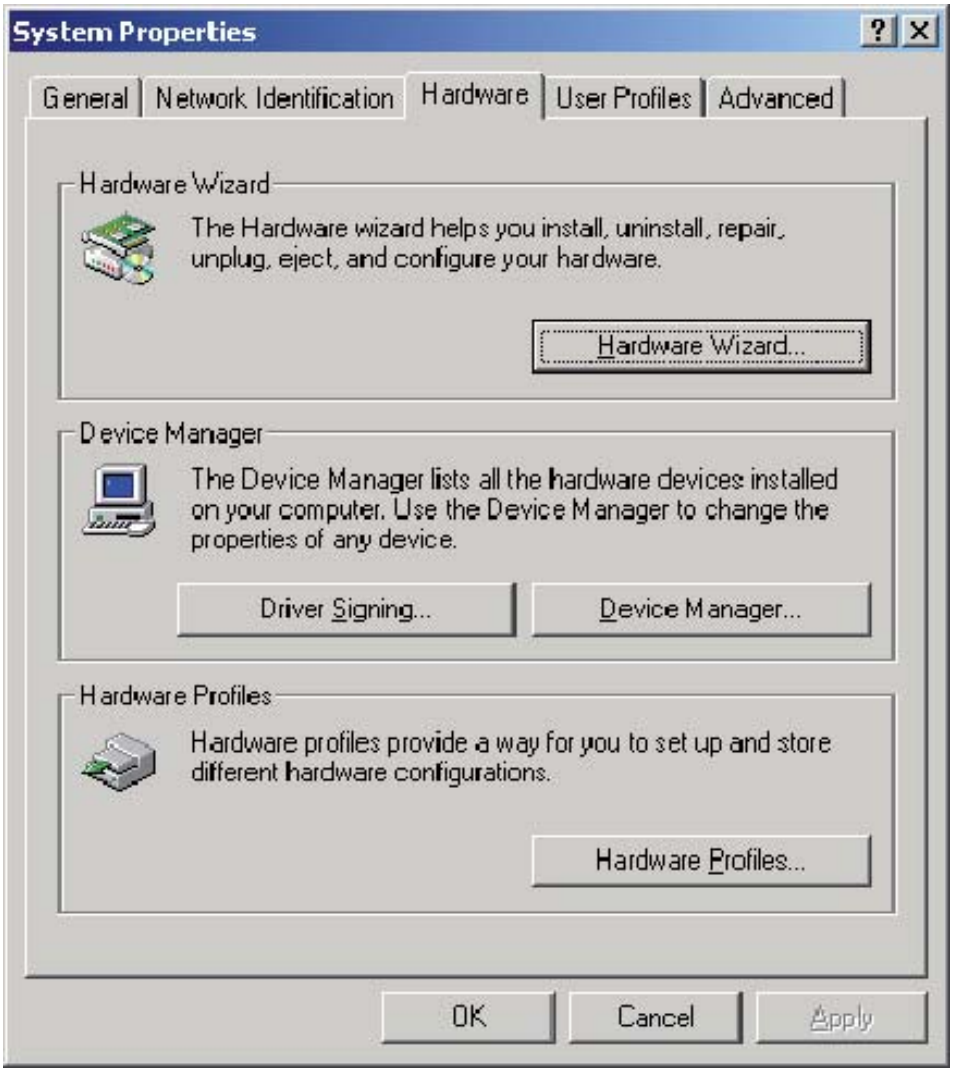




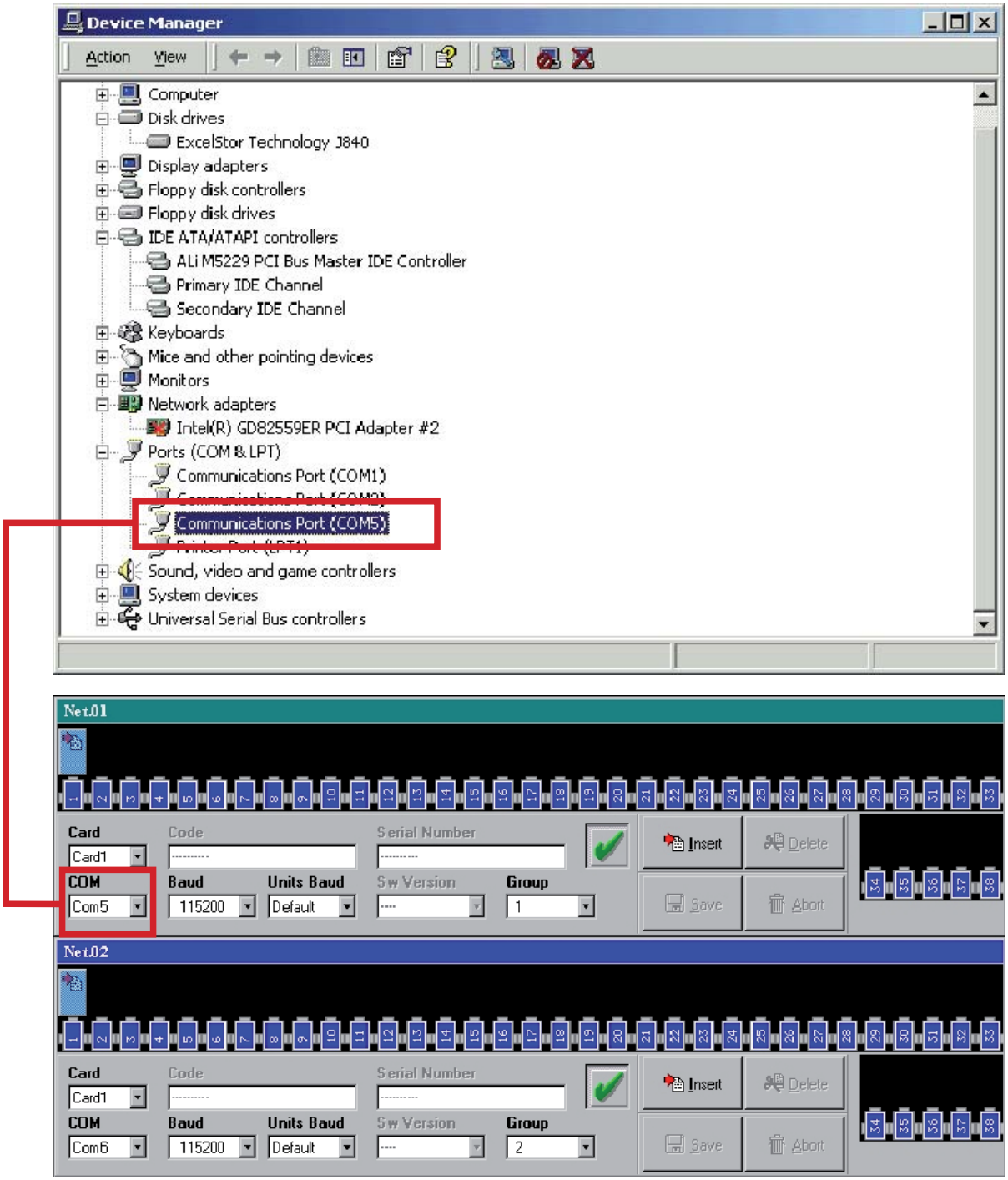
9.5 Checking the installation of the ISA card

After the installation of the card has been completed, close the cover and restart the PC.

To check whether the card has been correctly installed, click the right-hand key of the mouse on "*My computer*", in the Windows desktop.
Click "*System properties*" and select "*Hardware*": the window shown below appears.



When you click on the "*Device manager*" (or "*System*") key, the window shown below appears. Expanding the "*Ports (COM & LPT)*" item, the new COM port installed with the isa card is included: Windows calls it "*Communications Port*".



The numbering attributed by Windows to the COMs shown in the "*Device manager*" window (COM5, COM6, etc.) is the same that must be entered in the Marposs Driver Library configuration software.

N.B.: Install a standard driver for serial ports in case the isa card is not recognized by the system as described in this section.

9.6 Connection of networks to cards

The connection of the networks is made by means of an RS-485 serial cable, directly to connectors "*J1*" and "*J2*".

The cables come in the following lengths:

- 2mt code **6738057016**
- 10mt code **6738057023**
- 15mt code **6738057022**
- 25mt code **6738057017**

} *WITH power supply*

9.7 Calculation of absorption

To calculate the total absorption of the card and networks from the +5 V of the ISA slot, consider:

$V_{NETWORK} = 7,5Vdc$

$P_{CARD} = 1,5W$

K = 1,25 (*efficiency of DC/DC converter*)

$I_{NETWORK} = I_{MODULES} \times N_{MODULES}$

$P_{NETWORK} = V_{NETWORK} \times I_{NETWORK}$

$P_{TOTAL\ ABSORBED} = P_{NETWORK} \times K + P_{CARD}$

Example: the example shown below is specific for a DigiCrown configuration with a maximum RS-485 cable length of 10 m.

$N_{MODULES} = 31 + 31 = 62$

$I_{MODULES} = 0,04A$

$I_{NETWORK} = 62 \times 0,04 = 2,48A$

$P_{NETWORK} = 7,5 \times 2,48 = 18,6W$

$P_{TOTAL\ ABSORBED} = 18,6 \times 1, 25 + 1,5 = 24,75W$

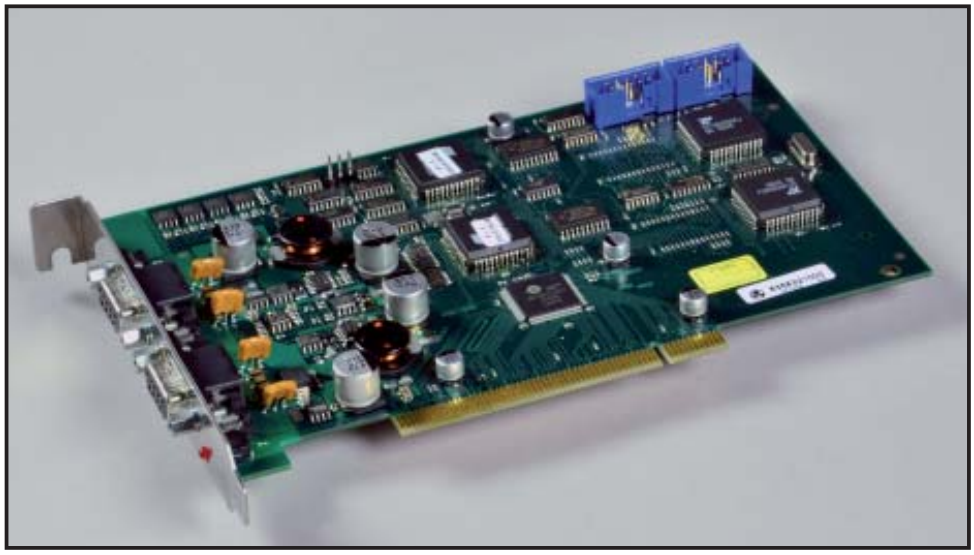
9.8 Technical specifications

DigiCrown **isa** - code **6355322000**	
Power supply	from ISA bus standard 5V
Absorption (P)*	1.5W + power towards networks
Absorption from +5 (I)	0,2 A + current towards networks
Input/Output	DigiCrown HW&protocol compatible
RS485 rate	prog. Baud 9600 or 208333
Operating temperature	standard PC
Maximum network length	up to 1 Km (depending on network configuration)
Number of networks per card	2
Dimensions	standard compact ISA
Absorbed power	vedi paragrafo 9.7

* ➔ Power required for management of configuration.
Should the power supply unit integrated in the PC not be able to supply this power, a *DigiCrown* **psu+psc** module must be installed.

10 PCI CARD

10.1 Application notes



The *DigiCrown* **pci** unit achieves the RS485 Half Duplex serial communication with the rest of the network. Each card is equipped with two serial ports, for the overall management of 31 + 31 sensors or I/O modules.

Up to 6 cards can be interlinked (see paragraph 3.1), for the management of up to 12 networks (372 active units).

The LEDs next to the serial ports display the operating status of the card.

10.2 Before starting installation…

In order to ensure the correct operation of the **pci** card, a PC with the following minimum specifications is needed:

- One free PCI slot
- Microsoft Windows operating system (Windows 2000, NT, XP)
- 128 MB of RAM
- 700 MHz processor

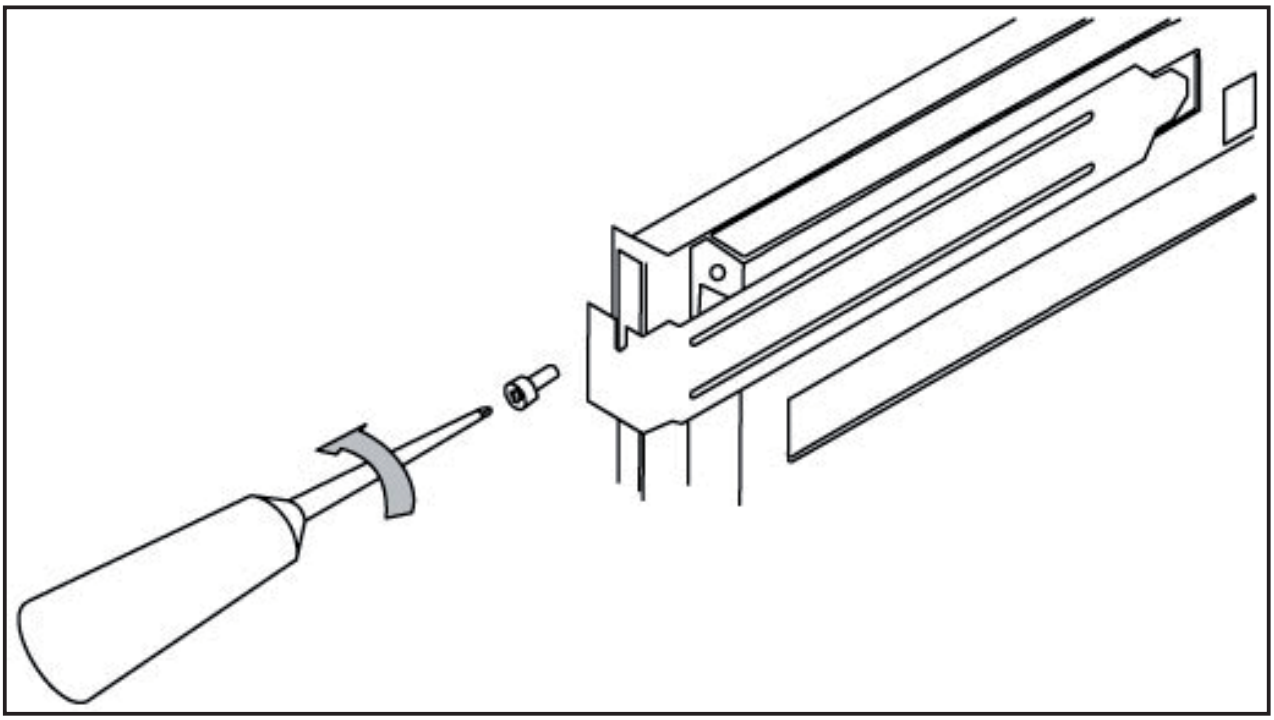
One of the following programs, which can be ordered separately, must be installed in
the PC:

- Quick SPC (release 2.2)
- Easy Acquisition (release 2.2)
- Marposs Driver Library

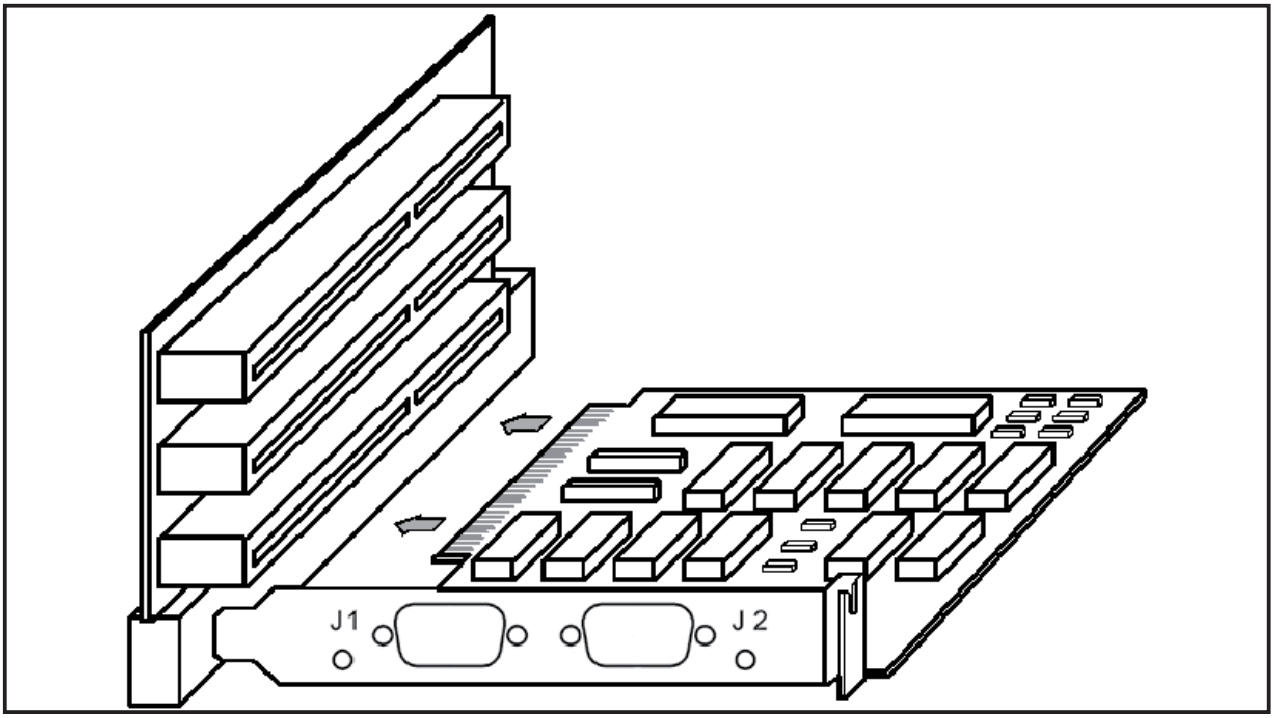
These programs enable the PC to recognize the **pci** card with the system drivers for the installation of the peripheral device.

10.3 Hardware installation

To install the **pci** card, switch the computer off, and remove the frame and the metal cover that protects the slot.



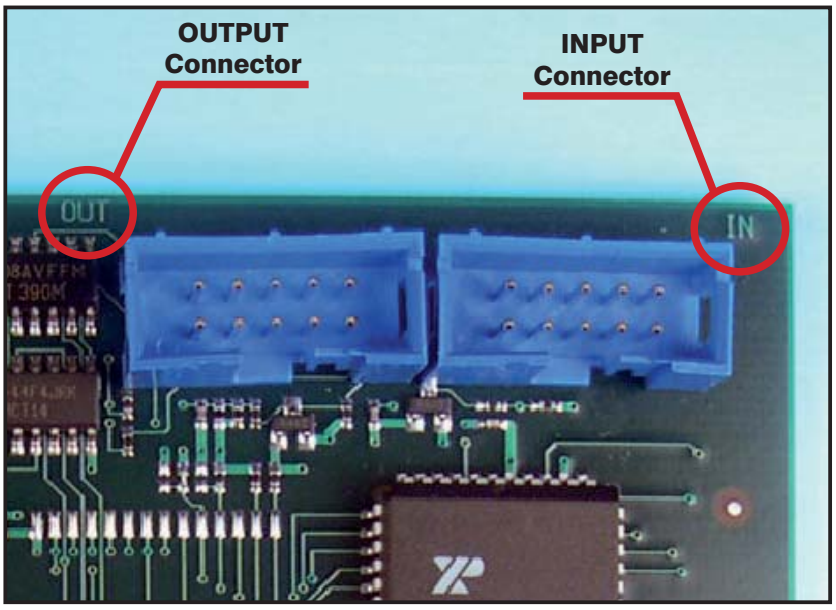
Insert the card in a free PCI slot.

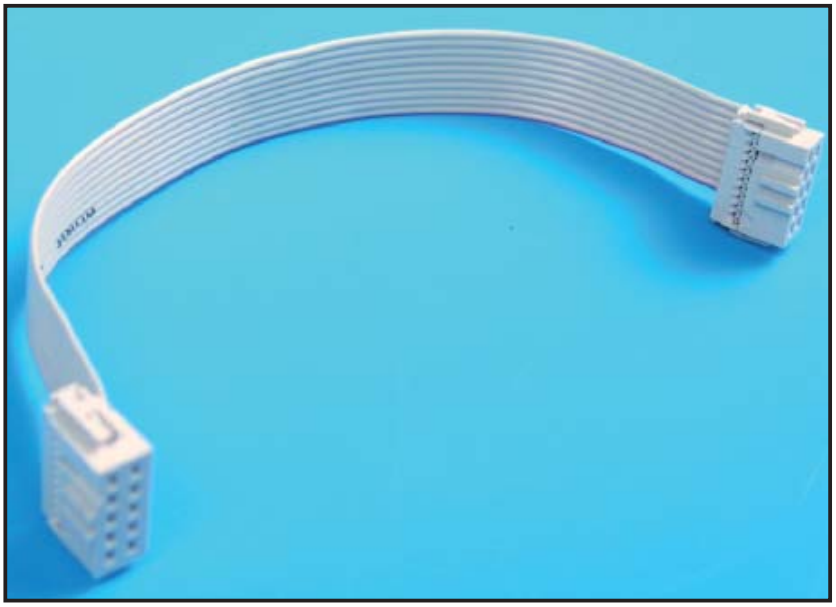


10.3.1 Synchronization of cards

The interlinking of the cards is achieved by means of the OUT-IN connectors, using the 10-pins flat cable that is supplied. This series connection, besides extending the configuration of the network to up to 6 pci cards (=12 networks), ensures the synchronization of the measurement reference frequencies in the various networks. An “isofrequency” system is thus obtained.

The flat cable must be connected to the OUT connector of a card, which becomes the master one, and to the IN connector of the next card. If further cards are present, the OUT connector is connected to the IN connector of the third one, and so on.



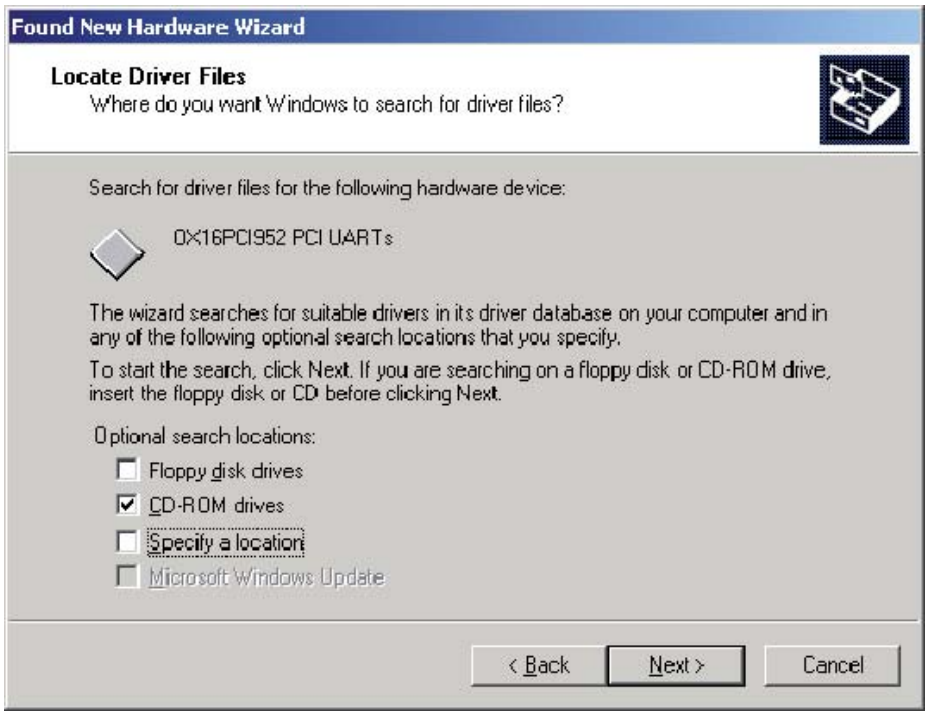


10.4 Setup card

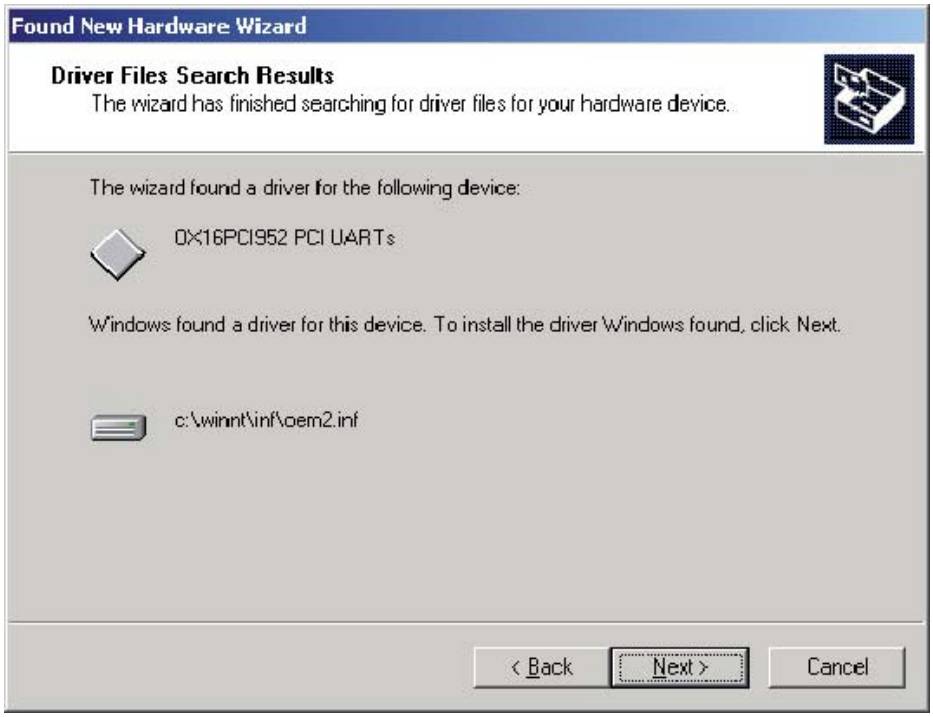
The recognition of the card by Windows is performed automatically.

When you press the "*Next*" key, the window shown below appears. Click on "*Search for a suitable driver for my device*" and press "*Next*".

In case Windows does not automatically find the driver, insert in the PC the CD-Rom of one of the following programs: **Quick SPC**, **Easy Acquisition** or **Marposs Driver Library**.
Click on the "*CD-ROM drives*" options, then press "*Next*".



As soon as the operating system has found the **pci** card driver, press "*Next*".

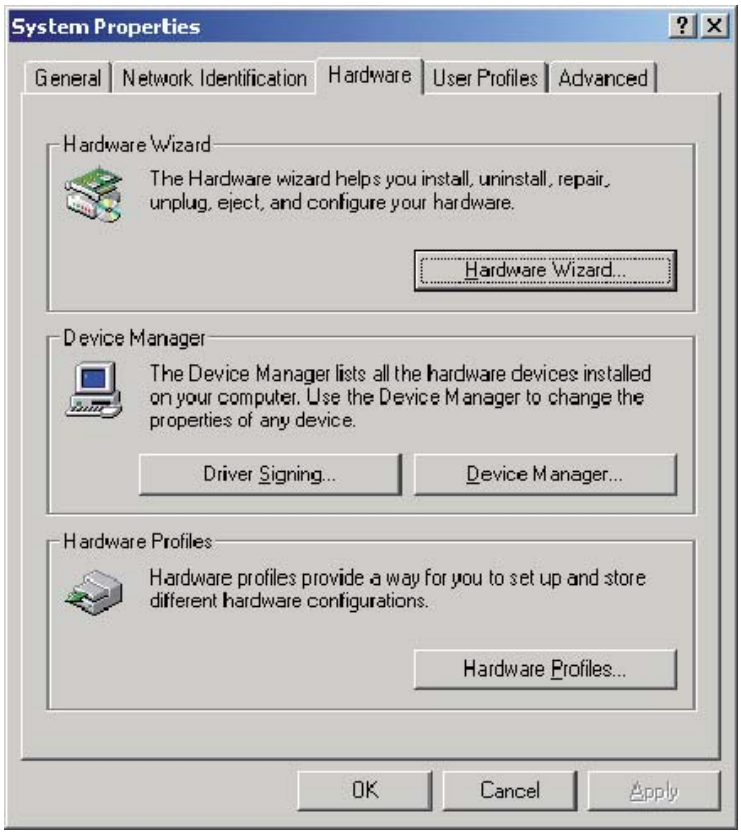


If the “Windows Logo testing” message pops-up saying that the software is not compatible with the operating system, press “*Continue Anyway*”.

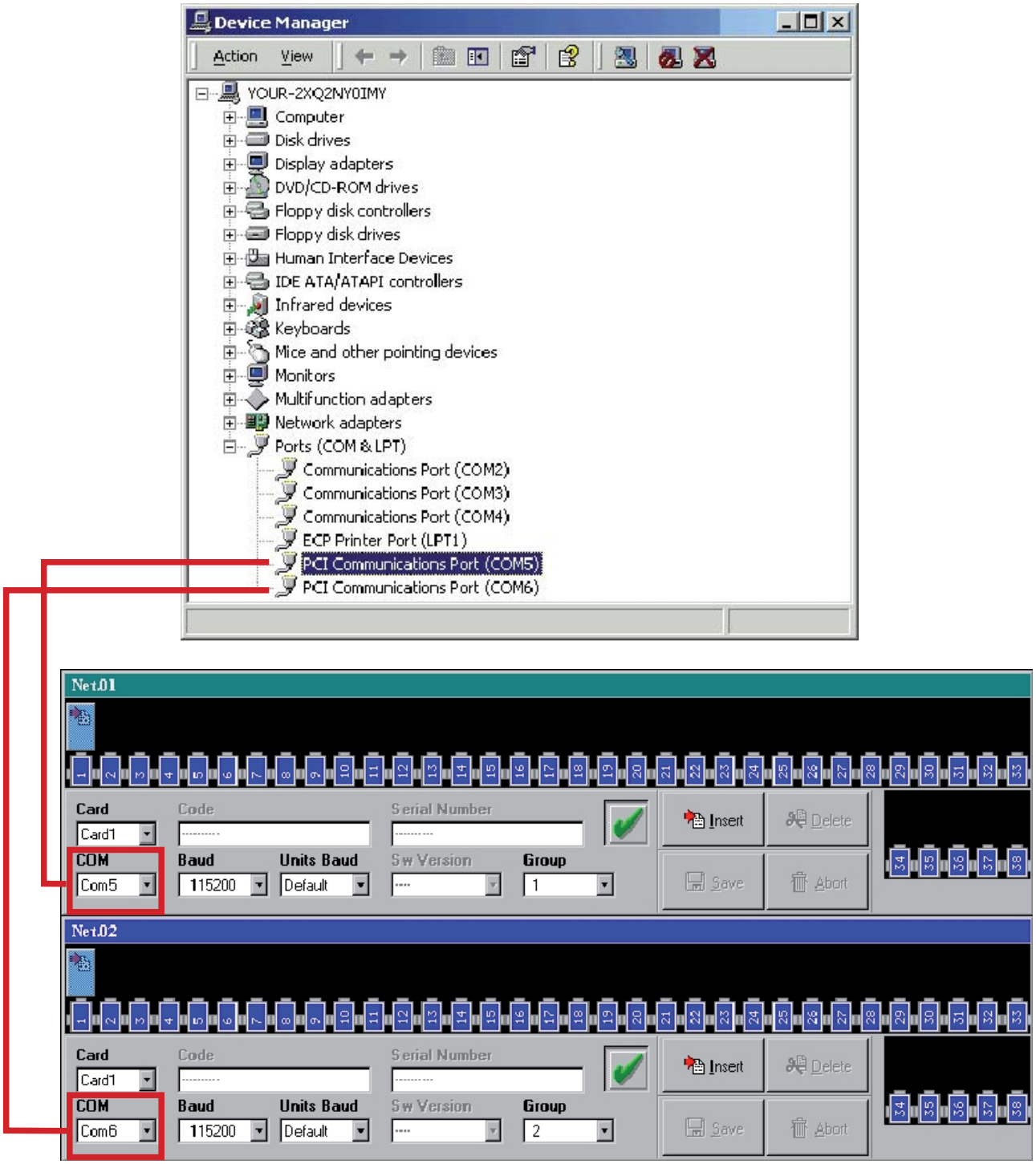
Press “*Finish*” to complete the installation.
If the operating system requests it, restart the computer.

10.4.1 Checking the installation of the pci card

To check whether the card has been correctly installed, click the right-hand key of the mouse on "*My computer*", in the Windows desktop.
Click on "*System properties*" and select "*Hardware*": the window shown below appears.



When you click on the "*Device manager*" (or "*System*") key, the following window appears. Expanding the "*Ports (COM & LPT)*" item, the new pair of COMs installed with the pci card are included: Windows calls them "*PCI Communications Port*".



The number of COMs assigned by the PC in the "*Device Manager*" window (COM5, COM6, etc.) is the same that must be entered in the "MDHQSPC" configuration software.

10.4.2 Connection of networks to cards

The connection of the networks is made by means of an RS-485 serial cable, directly to connectors "*J1*" and "*J2*".

The cables come in the following lengths:

- 2mt code **6738057016**
- 10mt code **6738057023**
- 15mt code **6738057022**
- 25mt code **6738057017**

} *WITH power supply*

10.5 Calculation of absorption

To calculate the total absorption of the card and networks from the +5 V of the PCI slot, consider:

$V_{NETWORK} = 7,5Vdc$

$P_{CARD} = 1,5W$

K = 1,25 (*efficiency of DC/DC converter*)

$I_{NETWORK} = I_{MODULES} \times N_{MODULES}$

$P_{NETWORK} = V_{NETWORK} \times I_{NETWORK}$

$P_{TOTAL\ ABSORBED} = P_{NETWORK} \times K + P_{CARD}$

Example: the example shown below is specific for a DigiCrown configuration with a maximum RS-485 cable length of 10 m.

$N_{MODULES} = 31 + 31 = 62$

$I_{MODULES} = 0,04A$

$I_{NETWORK} = 62 \times 0,04 = 2,48A$

$P_{NETWORK} = 7,5 \times 2,48 = 18,6W$

$P_{TOTAL\ ABSORBED} = 18,6 \times 1, 25 + 1,5 = 24,75W$

10.6 Technical specifications

DigiCrown **pci** - code **6355321000**	
Power supply	from PCI bus standard 5V
Absorption (P)*	1.5W + power towards networks
Absorption from +5 (I)	0,2 A + current towards networks
Input/Output	DigiCrown HW&protocol compatible
RS485 rate	prog. Baud 9600 or 208333
Operating temperature	standard PC
Maximum network length	up to 1 Km (depending on network configuration)
Number of networks per card	2
Dimensions	standard compact PCI
Absorbed power	vedi paragrafo 10.5

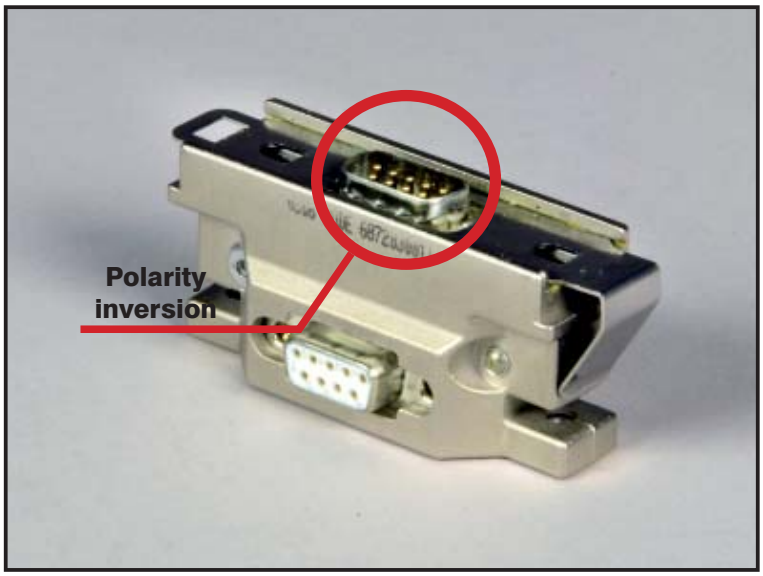
* ➔ Power required for management of configuration.
Should the power supply unit integrated in the PC not be able to supply this power, a *DigiCrown* **psu+psc** module must be installed.

11 NETWORK POWER SUPPLY UNIT

11.1 Application notes

The *DigiCrown* **psu** unit is formed of a stabilized power supply unit and an interface module to be connected to the network in the first module position. The **psu** unit supplies the required electric power, as reported on the Technical Specification.

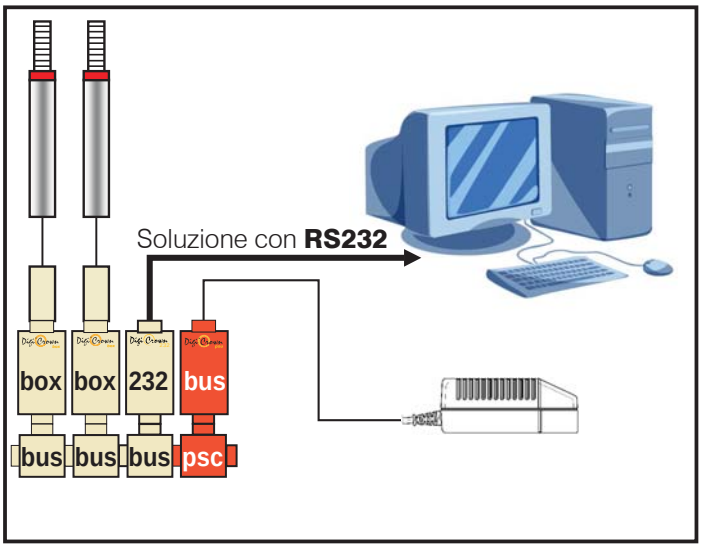
The connection of the **psu** module to the network is made via the *DigiCrown* **psc** connector, whose structure is identical to that of the **bus** connector for *DigiCrown* **box** modules. The only variation is the polarity inversion of the Cannon 9-way sub D-type connector and the power supply interruption on the bus.



11.2 Cases in which a psu module is required

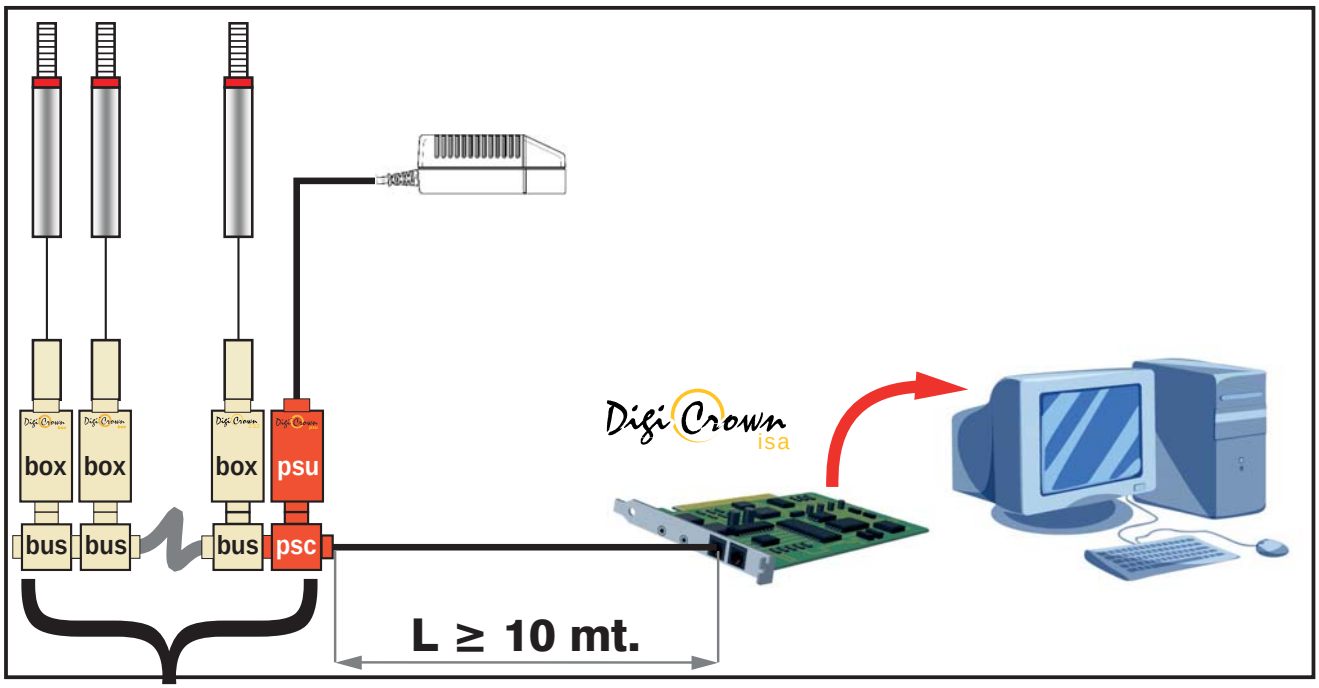
This power supply unit is always required in the following cases:

a) the network management is achieved with an RS-232 serial standard by means of a *DigiCrown 232/USB* module;



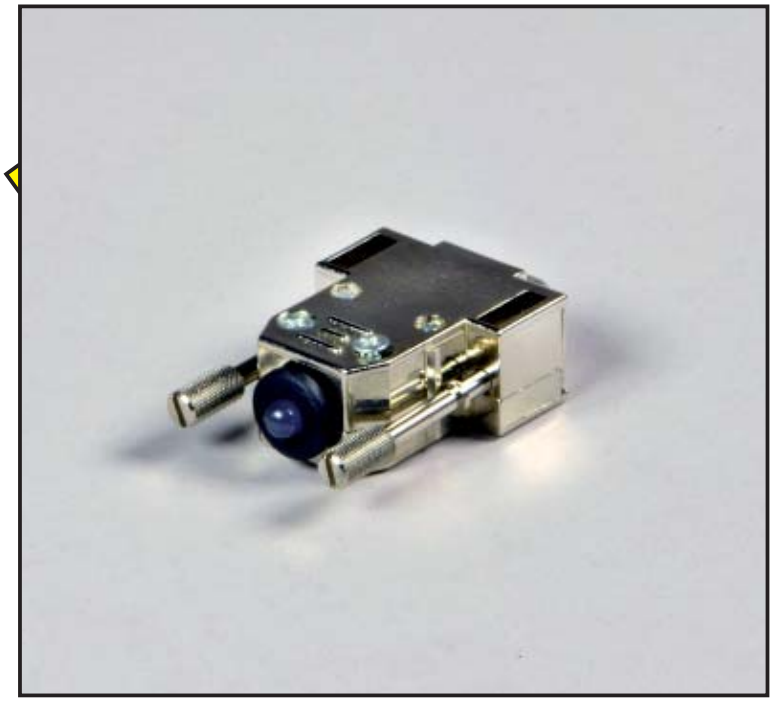
b) the power supply generated by the *DigiCrown PCI/ISA* modules (RS-485) is insufficient for a long cable: a **psu** module is installed in order to cope with the voltage drops.

When the network is connected to the computer via a **pci/isa** card, it is usually not necessary to install an additional power supply unit, unless there is the situation described in point B.



31 UNITS

11.3 End line connector



The end line connector is inserted as a closing element in each NET, and physically applied to the last *DigiCrown* **bus** module.

The function of this device is to indicate, by means of its integrated LED, whether the network is supplied with power at a voltage sufficient to ensure the correct operation of all the modules that are present.

There are three types of display in the network end connector:

- LED OFF ➔ voltage in bus insufficient
- LED ON (green light) ➔ voltage OK
- LED FLASHING (red/green light) ➔ ommunication in bus active

Should the voltage be insufficient to supply the network (point 1), it is necessary to install an auxiliary psu unit. Another solution may be for the user to remove some modules in sequence until the LED of the network end connector lights up, and to create an additional network (managed by means of a **232** interface or **pci/isa card**)..

11.4 Configuration of power supply unit (100-240VAC)

The ordering code **767W000000** identifies the network power supply unit that functions with a 100-240 VAC input voltage. This code includes several elements, but is not ready for use: it is necessary to order, as an accessory, the **psc** module (code 6872030011), and also the element for the connection to the local network (network cables and plugs complying with the standard adopted in the country where the equipment is used). Below, the available configurations. with the relevant ordering codes, are shown.

Cod.: 767W000000

Cod.: 4147000019

Cod.: 4147000016

- **EU extension**

Cod.: 4147000017

- **USA extension**

Cod.: 4147000013

- **EU plug**

Cod.: 4147000014

- **USA plug**

Cod.: 4147000015

- **UK plug**

Cod.: 4147000011

11.5 Configuration of power supply unit (24 VDC)

The ordering code **767W010000** identifies the network power supply unit that functions with a 24 VDC input voltage (machine voltage). The 24 VDC **psu** module is supplied with a 5m long electrical connection cable.
To complete the configuration of the 767W010000, it is necessary to order the **psc** module (code 6872030011).

Cod.: 767W010000

Cod.: 4147000011

11.6 Electrical protection of power supply unit

The power supply unit connected to the 100-240Vac **psu** module is equipped with the following protection systems:

- Protection against overload and short circuit: the circuit is equipped, in series, with a renewable fuse that is blown if there is an excessive current absorption.

As soon as these abnormal conditions disappear, an automatic system with which the **psu** module is equipped restores operating conditions without the need for any manual action.

11.7 Technical specifications

DigiCrown **psu (100-240 Vac)** - code **767W000000**	
Power supply*	100-240Vac / 47-63 Hz / 400mA
Output	7,5Vdc / 1,7A
Operating temperature	0 ÷ 40°C
Storing temperature	-20 ÷ +70°C
Protection degree	IP 43 (on side of interface with bus)
Protection against overload	with automatic resetting
Dimensions	see Chapter 15

*** ➔ The power supply must be installed in dry environments. The unit is specifically designed for indoor use only.**

➔ The sockets must be installed near the equipment and be easily accessible.

DigiCrown **psu (24 Vdc)** - code **767W010000**	
Power supply**	24Vdc (-20% / + 20%)
Output	7,5 Vdc / 1.8A
Current absorption	1A
Operating temperature	0 ÷ 40°C
Storing temperature	-20 ÷ +70°C
Protection degree	IP 43 (on side of interface with bus)
Protection against overload	with automatic resetting
Protection against inversion	with automatic resetting
Dimensions	see Chapter 15

****➔ Use a SELV power source (as defined by EN60950)**

12 SYNCHRONISMS

Using this feature, the acquisition will be for all measuring points at the same time, allowing a more correct implementation for dynamic measurements. The control for the acquisition of the measure can be given in three different ways:

by USB

If the USB module is used to control the timing for the acquisition, a time synchronism will occur. The measure will be performed at regular time intervals according to the scheduled period.

by I/O

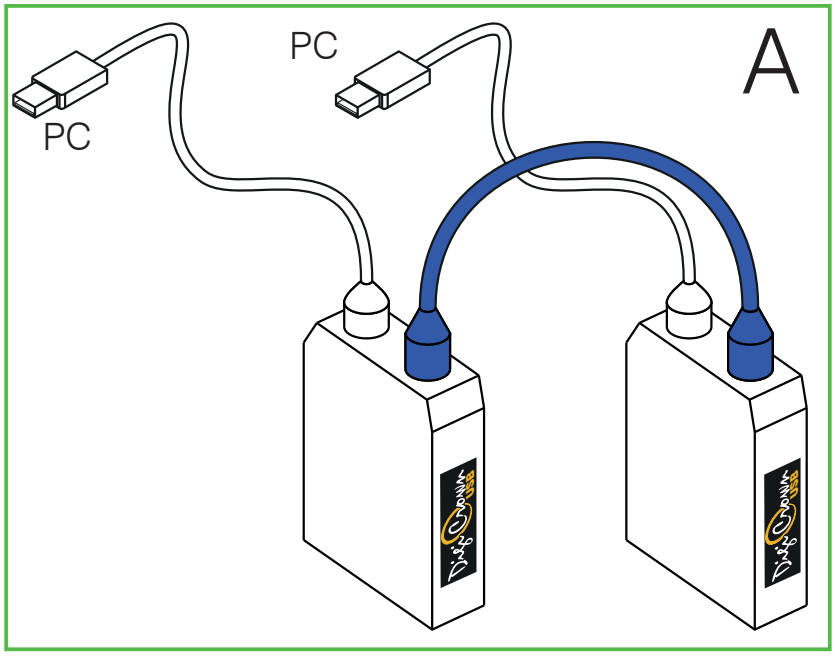
If the I / O module is used to control the data acquisition, this will occur after an event related to an I / O, such as pressing a button.

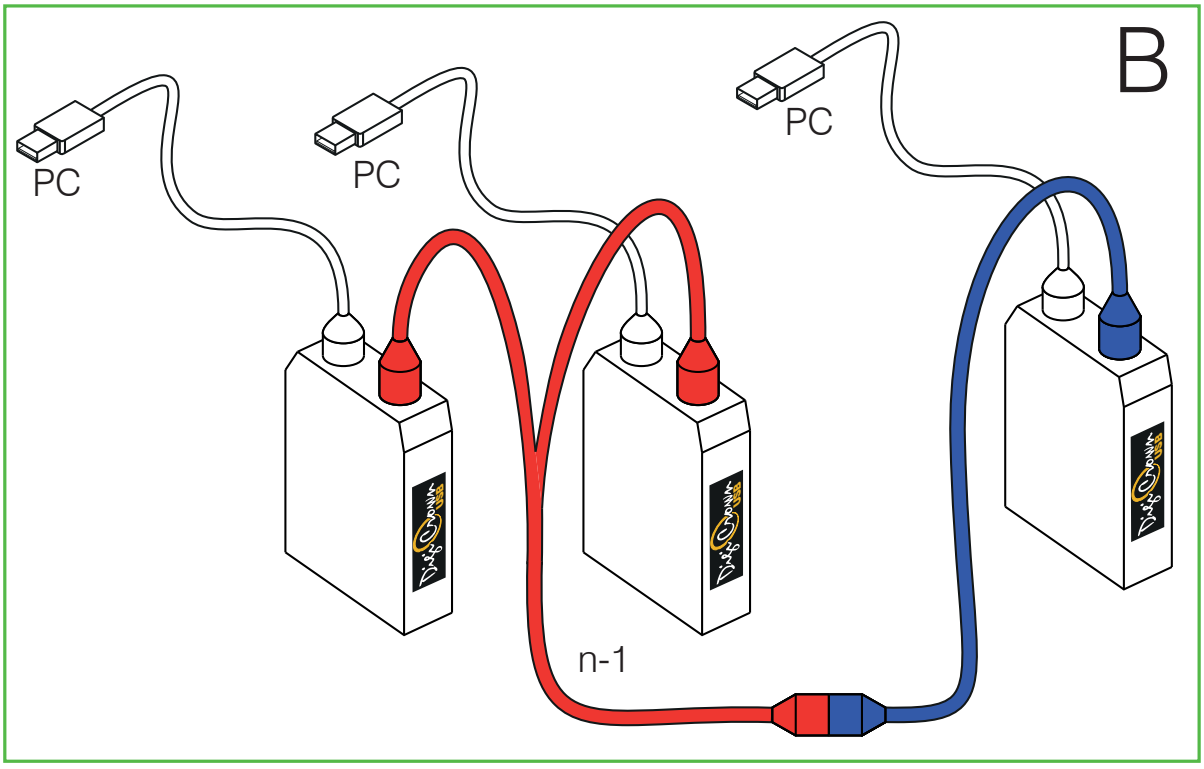
by encoder

If the encoder module is programmed to control the acquisition of the measure, the measure will be carried out according to the position of the encoder itself.
For example, in case of a rotating piece, this type of synchronization ensures that the measure is carried out always in the same point, freeing it from the time and the rotation speed of the workpiece.

All acquired data are stored in the memory inside the USB module, so that it can be accessed through the SDK or the protocol commands.
Synchronization is also planned to be used with more networks. It is possible in fact to make multiple networks synchronized and therefore the measure carried out at the same time. In the configuration in which two networks are to be synchronized the cable to use has two male circular connectors (code: 6735933007) and it should be connected as shown in Figure A. For configurations with 3 or more networks (max. 16) n-1 have to be used cables with three connectors (2 males and one female, code: 6735931013) and a cable with two male connector as illustrated in figure B, where n is the number of networks.

Note:
The 2 Channel box module and Analog Input module support High Speed Sync mode, providing enhanced network performance.

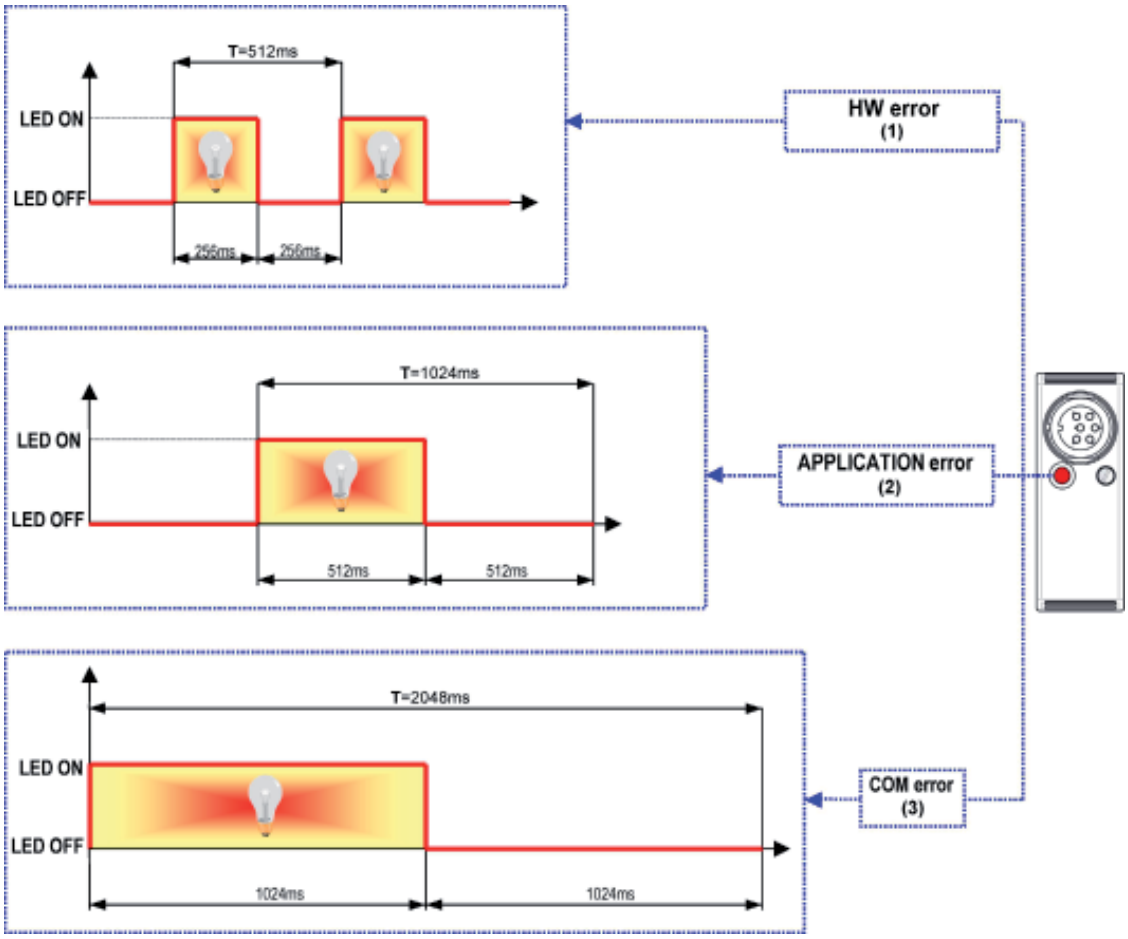

A
PC
PC


B
PC
PC
PC
n-1

13 LED FOR DISPLAY OF UNIT OPERATING STATUS

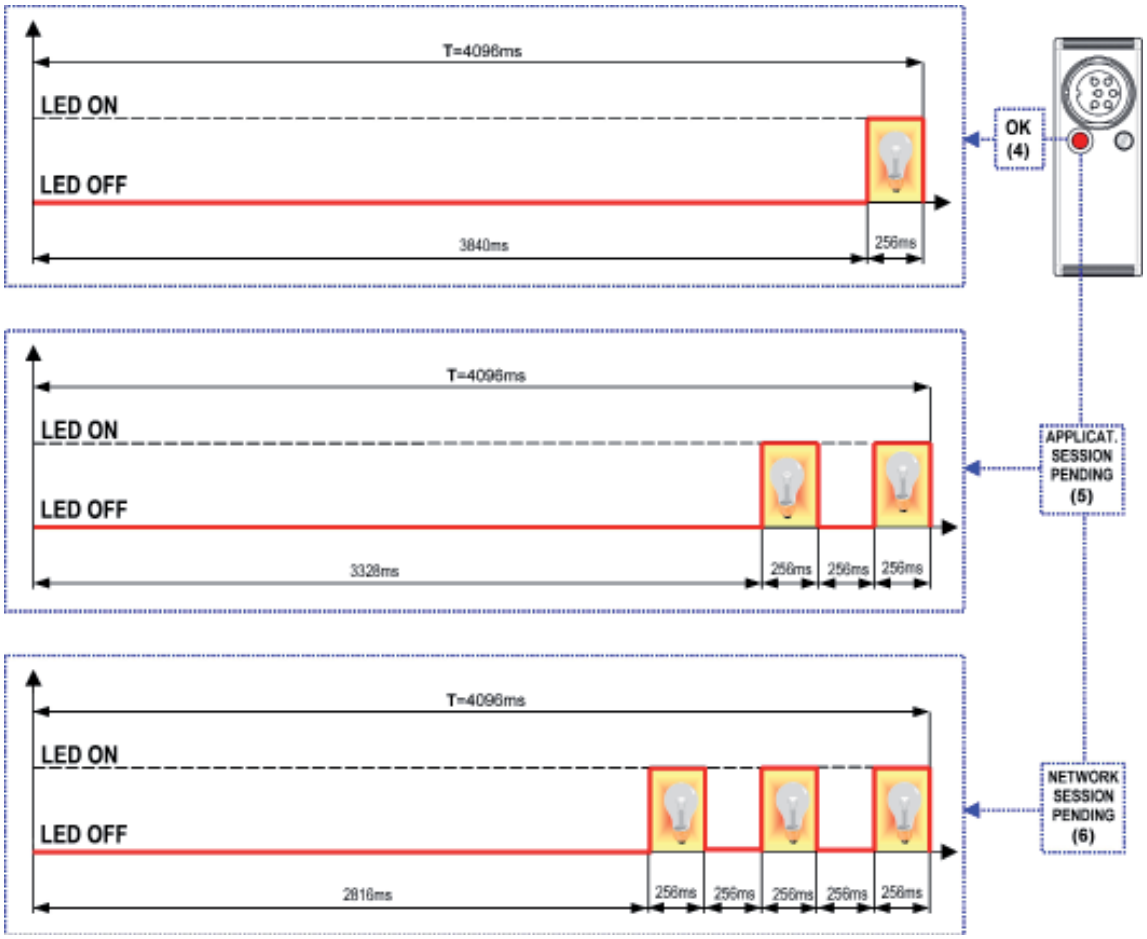
The type of lighting of the red LED on the box module indicates the operating status of the unit.
There are the following flashing modes:
• "ON ERROR" (the LED is activated only when an error is generated – par. 13.1)
• "AUTOMATIC" (this mode includes both the ON ERROR warning and brief flashes to indicate the sessions pending in the network – par. 13.2).
• "DETECTION" (during the initial pencil probe mapping stage, the activation of a sensor connected to a box module causes the relevant LED to light up).

13.1 "ON ERROR" mode



Note:
(1) HW ERROR ➔ general hardware and bootstrap errors
(2) APPLICATION ERROR ➔ specific errors of the **box**
E.g.: transducer-disconnected alarm, etc.
(3) COM ERROR ➔ error in serial RS-485 communication

13.2 “AUTOMATIC” mode



Note:

(4) OK ➔ the network is in working order

(5) APPLICATION SESSION PENDING ➔ pending measurement status of the box module - *E.g.: dynamic/vectorized measurement status, etc.*

(6) NETWORK SESSION PENDING ➔ identification session of the various network units

14 GROUND CONNECTION

In this chapter are reported different technical solutions in order to make sure the DigiCrown system is properly grounded, according to the NET's configuration and to the lay-out of the different units.

The purpose of ground connection is to minimize as much as possible the electrical noise and the interference, typically affecting the measurement signal.

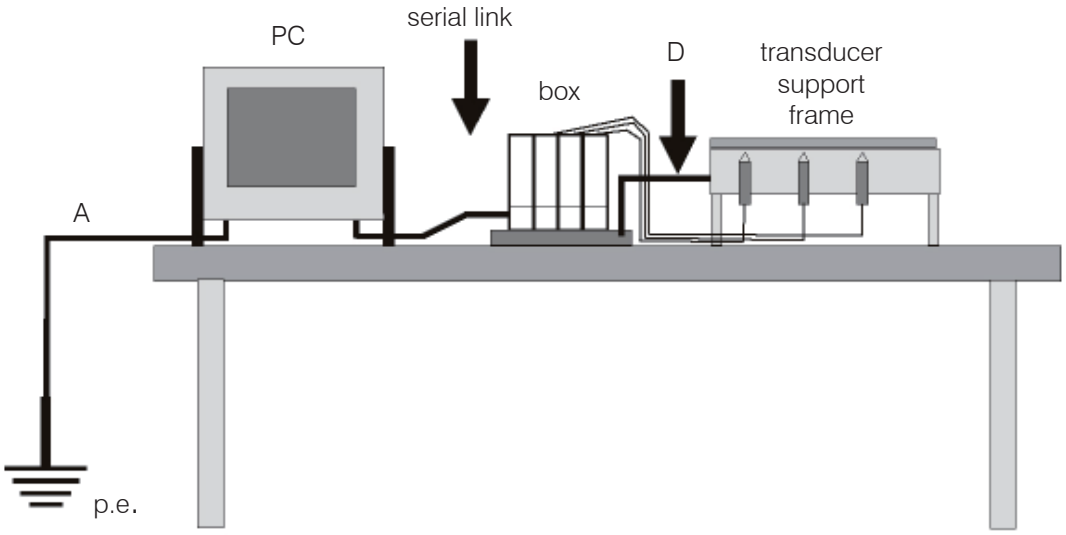
The ground connections schemes reported in this paragraph represent the optimal solution in order to have a system fully compatible with the EMC standards, according to the following directives:

- 73/23/EEC
- 2004/108/CE
- EN55022: 1998 (EMC)
- EN55024: 1998 (EMC)

If for a specific application the customer considers such technical solutions not required, Marposs is not responsible for any possible inaccurate working condition of the devices.

Bench application n. 1

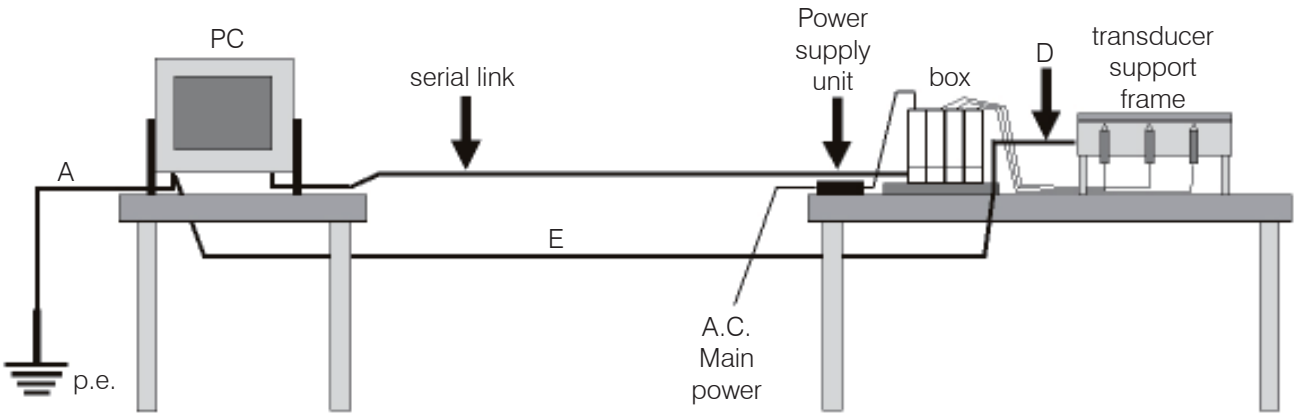
The whole DigiCrown system (control + measurement) has been placed on a single bench gauge.



The "D" equipotential connection between the box modules and the transducers support frame, can be done whether a metallic conductive frame is used. In the glass gauging applications the transducers support frame is usually not a conductive material and the transducers are typically insulated, in this case no ground connection is required.

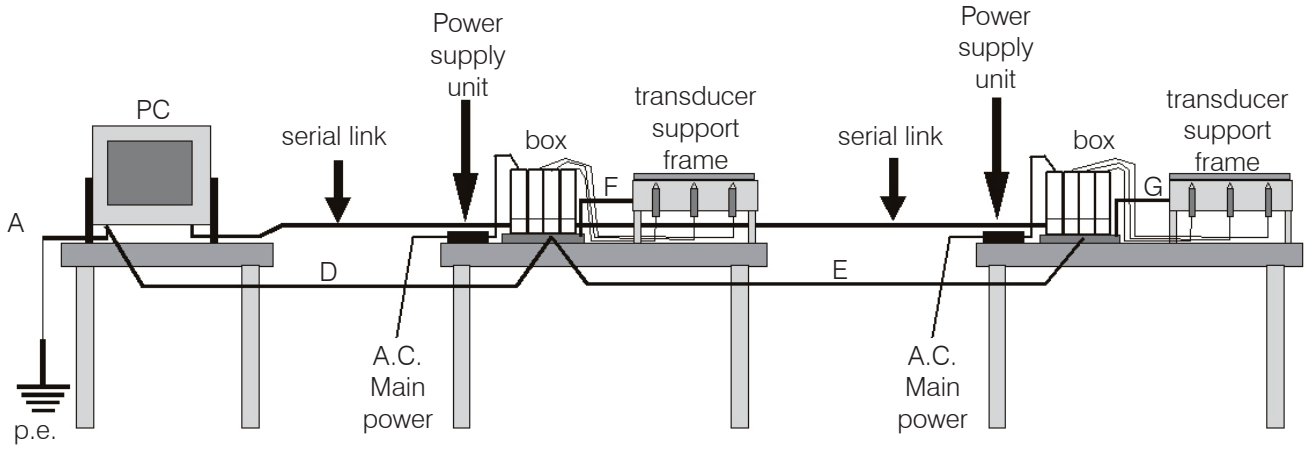
Bench application n. 2

In case the control system (PC…) is placed on a bench while the transducers and the box modules on another, we suggest to set-up an equipotential link as shown in the points: **A + D + E**.



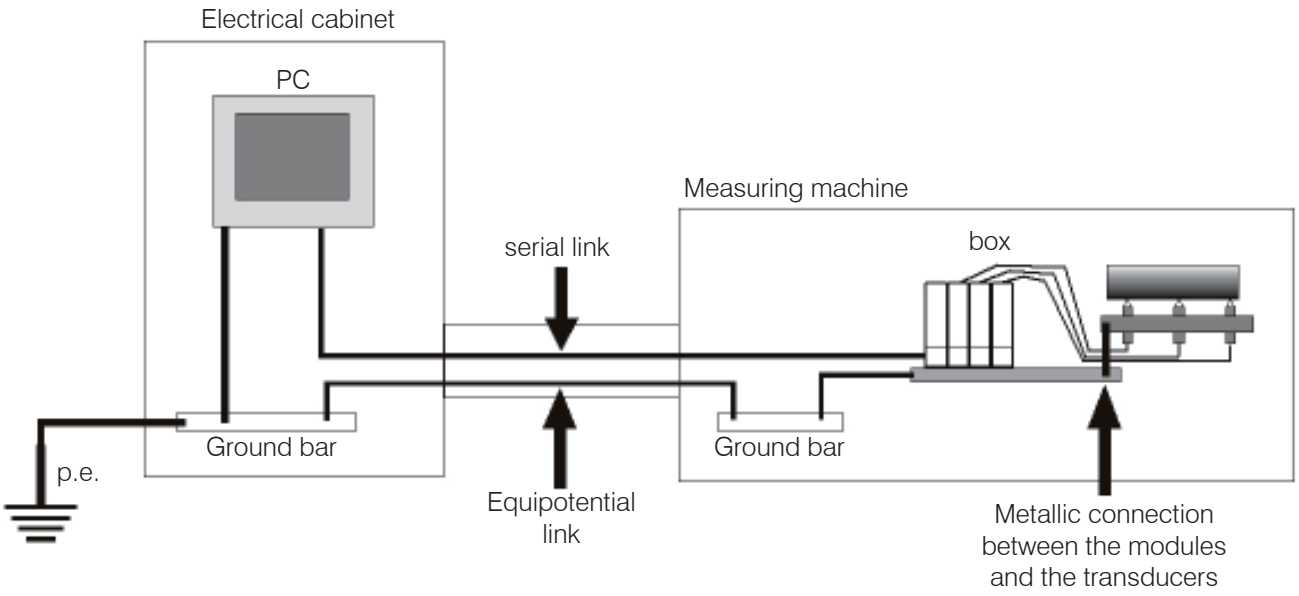
Bench application n. 3

If the DigiCrown system is split on two or more benches, we suggest to set-up an equipotential link as shown in the points: **A + D + E + F + G**.



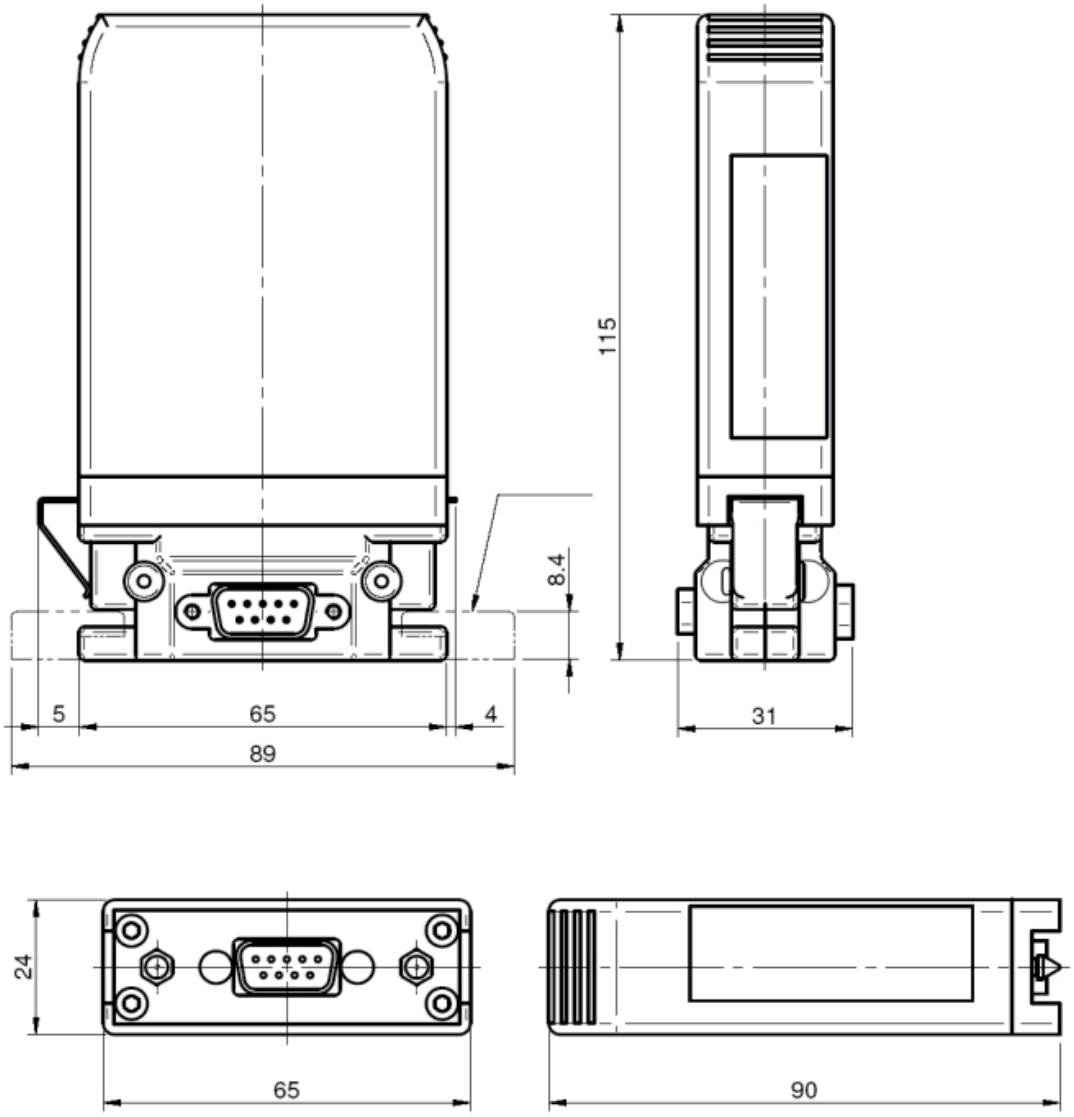
Automatic machine application

For such applications it is strongly suggested to provide the box units and the transducers support frame with an equipotential link: in the automatic machine applications the eddy-currents normally flow in the transducer's shield.

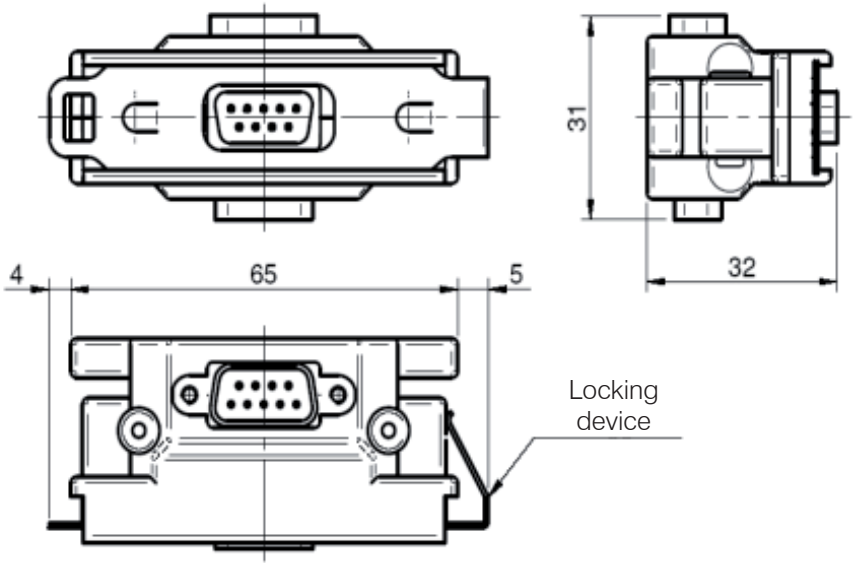


15 INSTALLATION DIAGRAMS

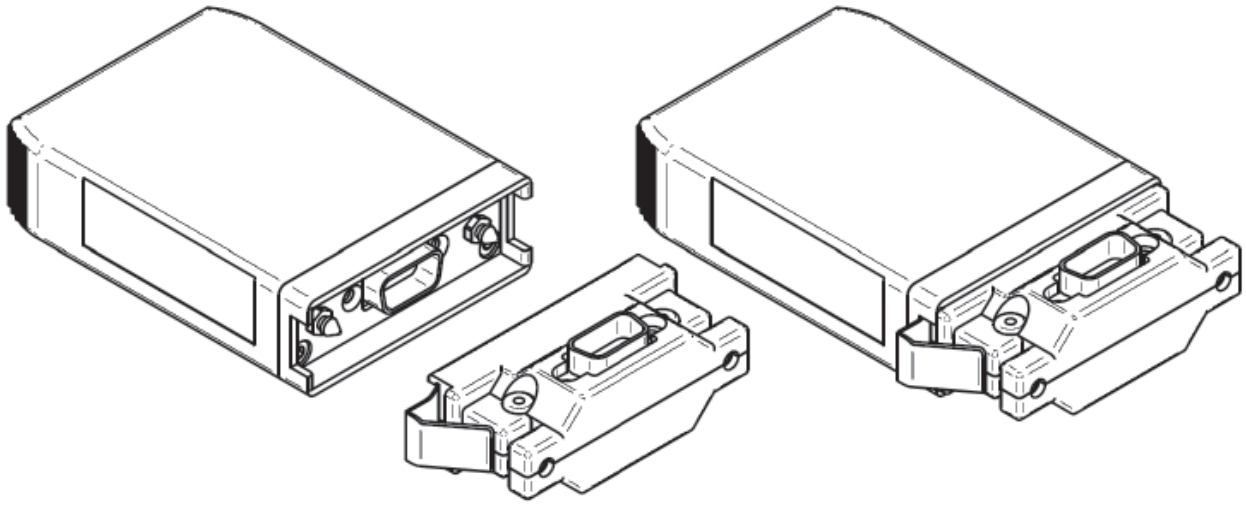
15.1 Box module



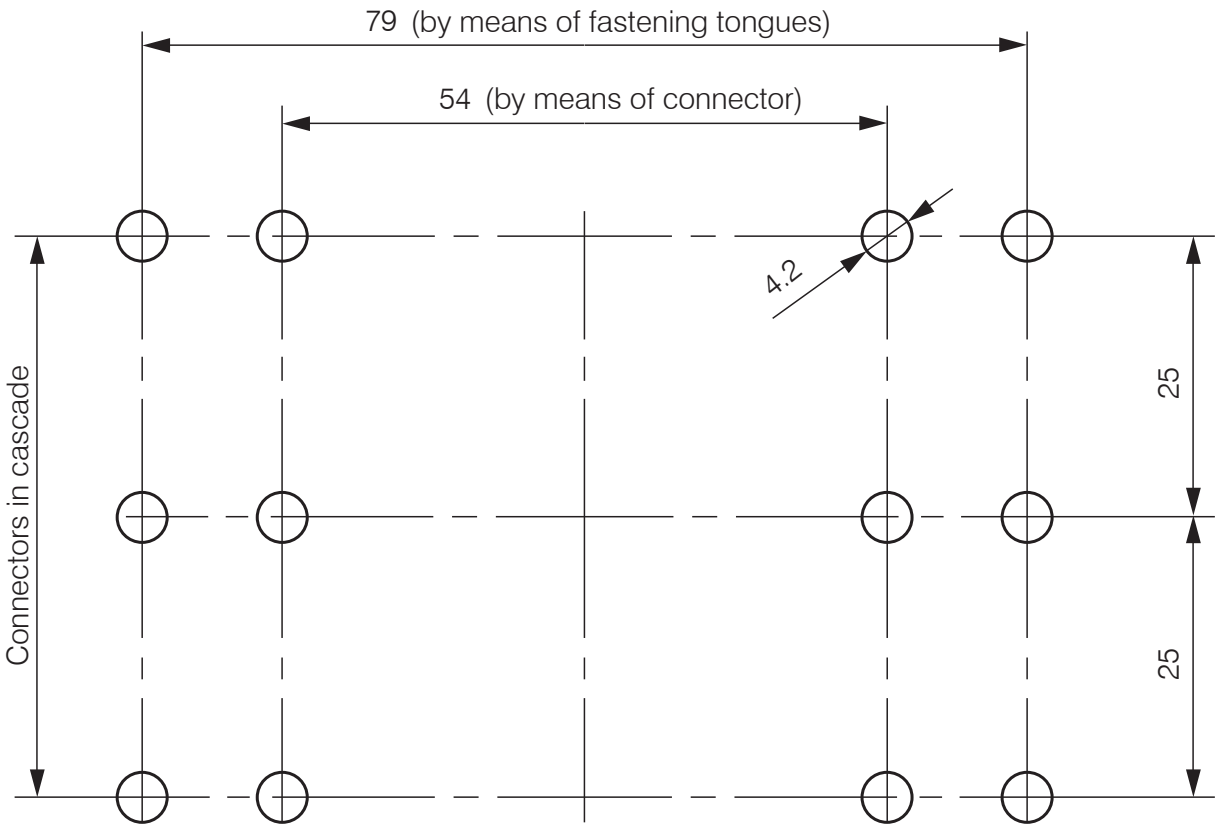
15.2 Bus module



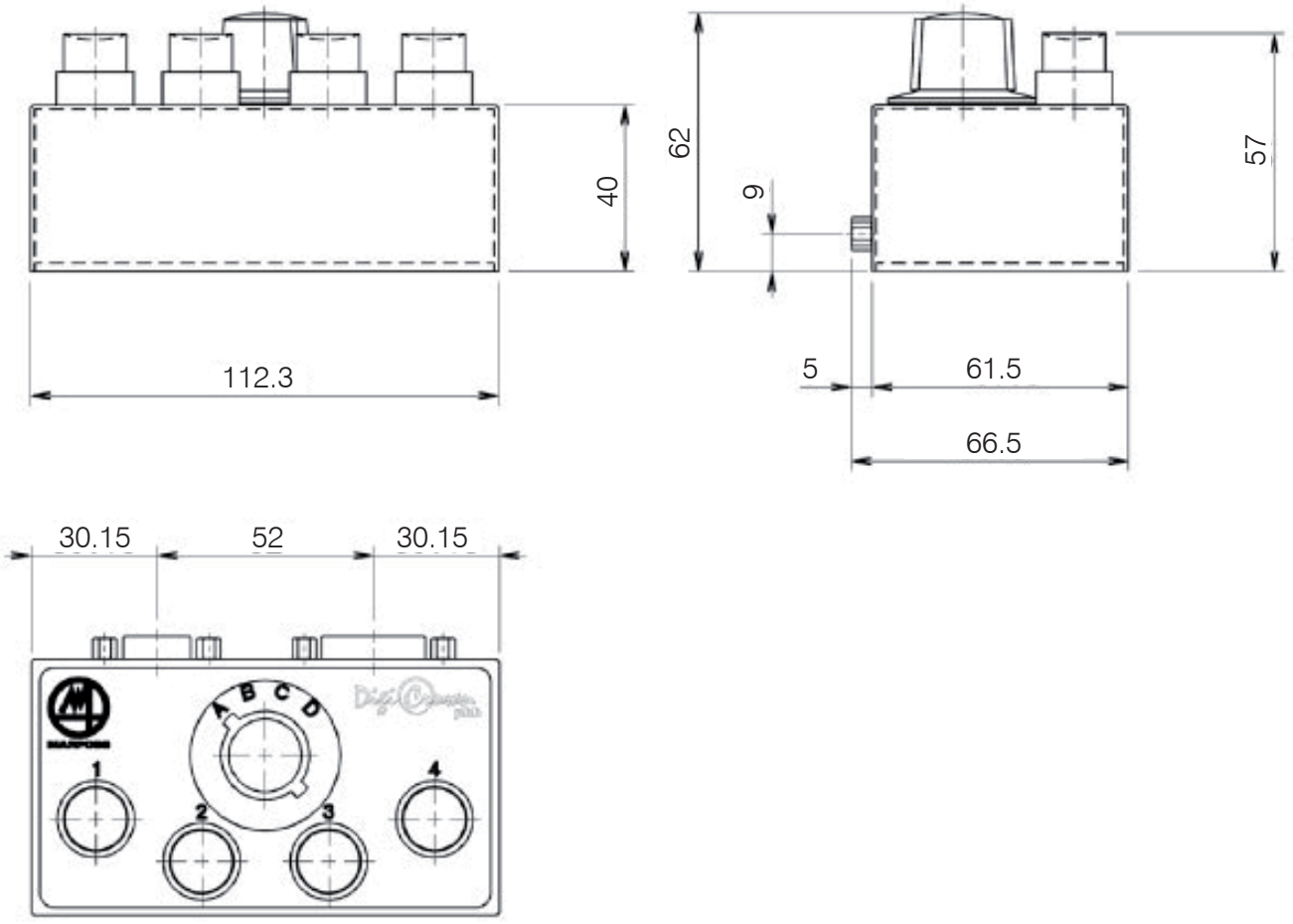
Hooking of box module to bus connector.



Dimensions of fastening to stand



15.3 Dimensional drawings Digi PBB unit



16 DECLARATION OF CONFORMITY

MARPOSS S.p.A. hereby declares that the devices referred to in this manual conform to CE safety requirements and EMC electromagnetic compatibility requirements, in accordance with the following directives:

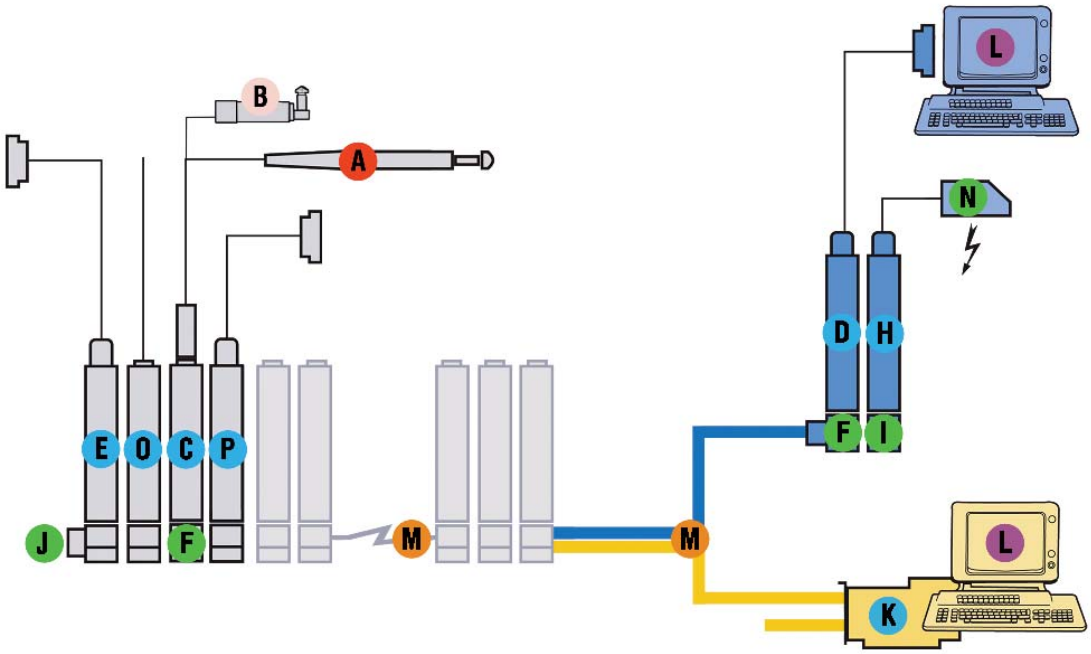
73/23/EEC	of 19-02-1973 (LOW VOLTAGE directive)
2004/108/EC	of 20-01-2005 (EMC directive)

The apparatuses were designed, assembled and tested in conformity with the following European standards:

EN60950: 2000 (Safety)
EN61326 - 1: 1997 (EMC)
EN61326/A1: 1998 (EMC)

17 ORDER CODES

The tables below provide a summary of the order codes for all components in the DigiCrown Probing Line.



INTERFACES		
	DESCRIPTION	ORDER CODE
C	DIGI CROWN BOX	767X000100
C	DIGI CROWN BOX + RAM	767X000210
C	DIGI CROWN BOX 2 TRANSDUCERS	767X200400
D	DIGI CROWN 232 FULL SPEED	767Y000100
D	DIGI CROWN USB HIGH SPEED SYNC INT	767Y010500
D	DIGI CROWN USB HIGH SPEED SYNC INT + EXT	767Y010505
D	DIGI CROWN USB FULL SPEED	767Y010100
H	DIGI CROWN PSU (110-240VAC/7,5VDC)	767W000000
H	DIGI CROWN PSU (24VDC/7,5VDC)	767W010000
O	DIGI CROWN AI UNIVERSAL HIGH SPEED	767A000400
P	DIGI CROWN EI HS D-SUB9	767E010500
E	DIGI CROWN I/O 24V SINK-HS SYNC	767I000500
E	DIGI CROWN I/O 24V SOURCE-HS SYNC	767I010500
E	DIGI CROWN I/O ONLY INPUT-HS SYNC	767I020500

K	DIGI CROWN PCI	6355321100
K	DIGI CROWN ISA	6355322100

EXTENSIONS		
	DESCRIPTION	ORDER CODE
M	EXTENSION WITH POWER SUPPLY 2M	6738057027
M	EXTENSION WITH POWER SUPPLY 3,5M	6738057029
M	EXTENSION WITH POWER SUPPLY 6M	6738057031
M	EXTENSION WITH POWER SUPPLY 10M	6738057033
M	EXTENSION WITH POWER SUPPLY 15M	6738057035

ACCESSORIES		
	DESCRIPTION	ORDER CODE
G	DIGI CROWN PBB	6139013200
J	END LINE CONNECTOR	6355200000
F	DIGI CROWN BUS	6872030010
I	DIGI CROWN PSC	6872030011
N	EU PLUG	4147000013
N	UK PLUG	4147000015
N	USA PLUG	4147000014
N	EU CABLE	4147000016
N	USA CABLE	4147000017

SW PAKAGES		
	DESCRIPTION	ORDER CODE
L	QUICK SPC	CM2Z32MA00
L	MDHQSPC V.3.2	CM2E32MA12
L	EASY ACQUISITION	CM2F23MA01
L	EASY ACQUISITION SPC	CM2F23MA01
L	SDK DIGICROWN	XXXXXXXX

NOTES

2002/95/CE
2002/96/CE

INFORMATION FOR USERS

concerning the terms of the National Legislation enforcing the Directives 2002/95/EC, 2002/96/EC and 2003/108/EN on the restriction of the use of certain hazardous substances in electrical and electronic equipment, and the disposal of waste materials

The wheel bin symbol with a cross through it on the equipment or its packaging indicates that the product must be disposed of separately from other waste materials at the end of its working life.
If the user wishes to dispose of this equipment, he/she must do so in accordance with the applicable National regulations governing the separation of the unit into its waste materials at the end of its working life.
Separating waste materials correctly before submitting the equipment for recycling, treatment and environmentally compatible disposal can help to prevent potentially negative effects on health and the environment, as well as making it easier to reuse and/or recycle its constituent materials.
Failure to dispose of this product in accordance with these indications is punishable in accordance with the applicable laws.

A complete and updated list of the addresses is available in the Marposs website: www.marposs.com
D4340050G7 *- Edition 02/2012 - Specifications subject to changes.*

Marposs has an integrated Company Management system for quality, environment and safety, certified by ISO 9001, ISO 14001, OHSAS 18001 and QS9000 T&E certifications. Marposs has been awarded the EAQF 94 Qualification and the Q1-Award.