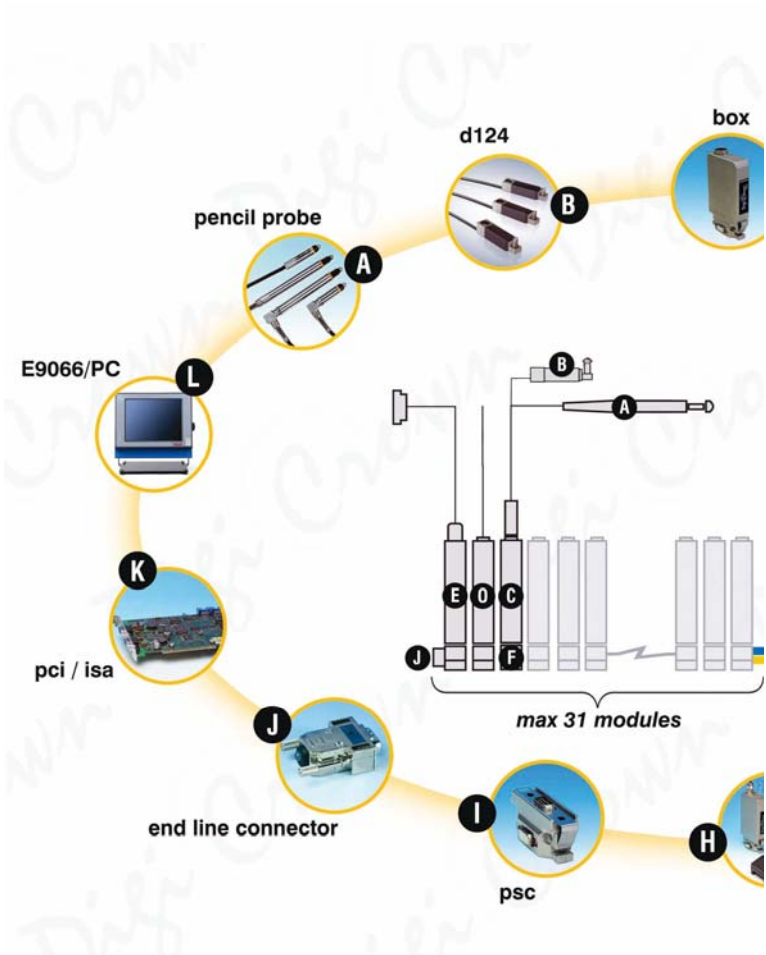
INSTRUCTION MANUAL

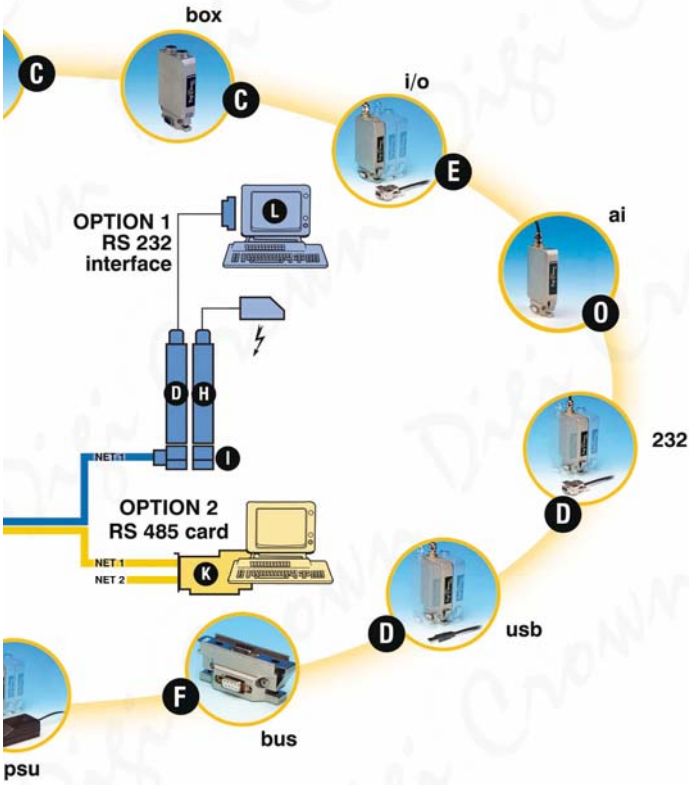
TESTAR
a MARPOSS DIVISION

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 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* ***232/USB*** unit.




box
C
C
i/o
E
ai
O
OPTION 1
RS 232
interface
L
D
H
I
NET 1
232
D
OPTION 2
RS 485 card
NET 1
NET 2
K
D
usb
F
bus
psu

2. APPLICATION NOTES (*232* UNIT)

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.

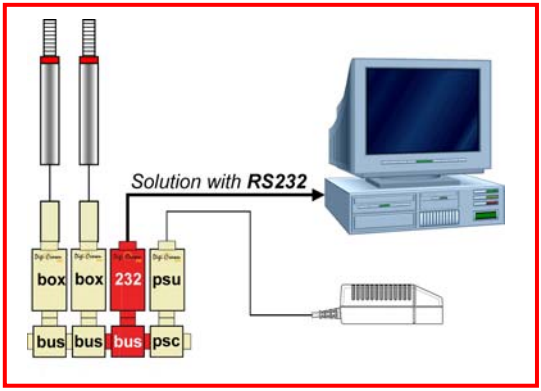
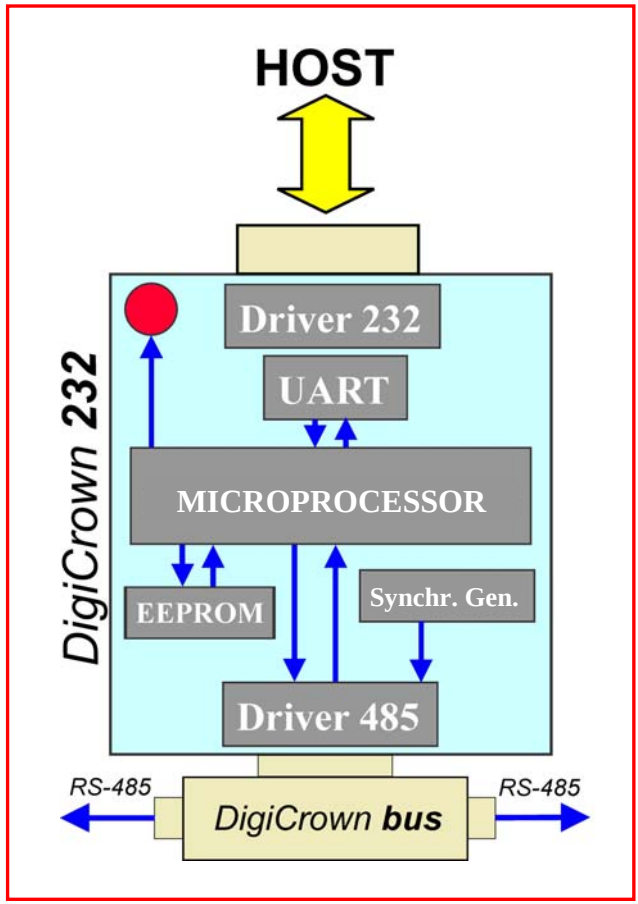


Fig. 1

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).



3. APPLICATION NOTES (*USB* UNIT)

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

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. 2). 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.

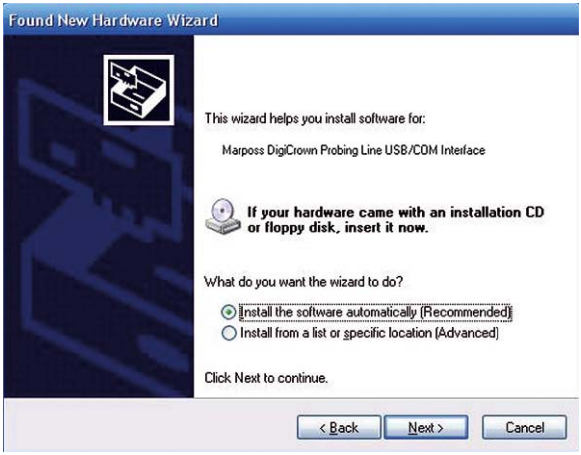


Fig. 2

The ***USB*** module requires to be matched with a ***PSU*** unit for the NET power supply (see figure 3).

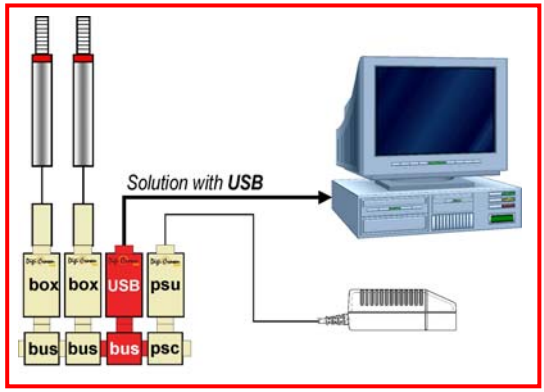


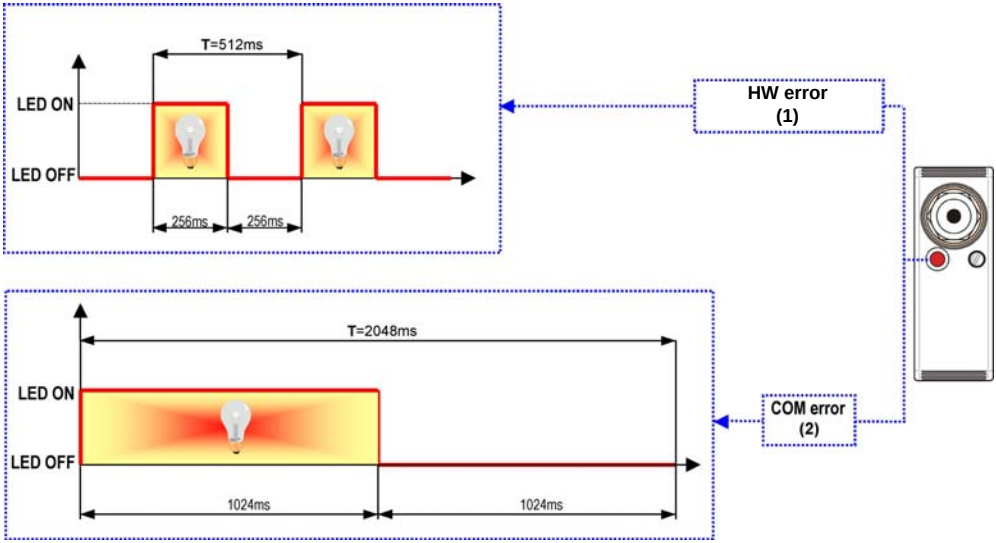
Fig. 3

4. LED FOR DISPLAY OF UNIT OPERATING STATUS

The type of lighting of the red LED on the ***232/USB*** 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).*
- "AUTOMATIC" *(this mode includes both the ON ERROR warning and brief flashes to indicate the network sessions pending – par. 3.2).*

4.1. “ON ERROR” or “AUTOMATIC” mode

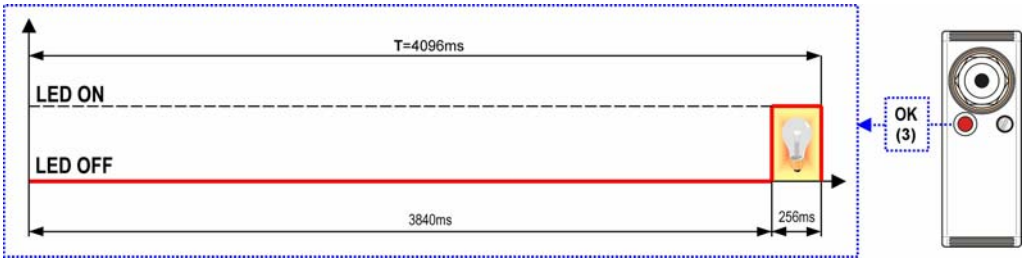


Notes:

(1) HW ERROR → general hardware and bootstrap errors

(2) COM ERROR → general serial driver and/or protocol error

4.2. “AUTOMATIC” mode



Notes:

(3) OK → the network is in working order

5. 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.

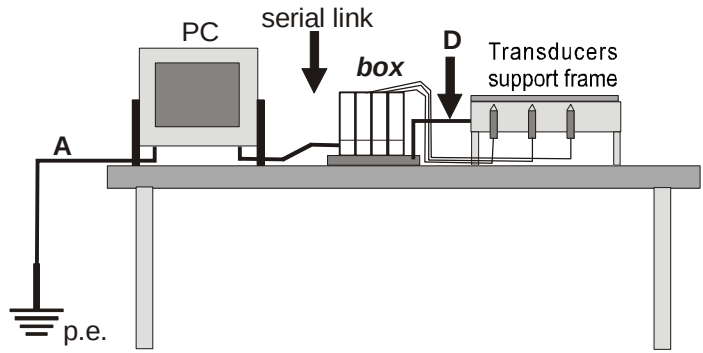
The ground connections schemes reported in this paragraph represent the optimal solution in order to have a system fully compatible with the EMC standards, according to the following directives:

- 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**

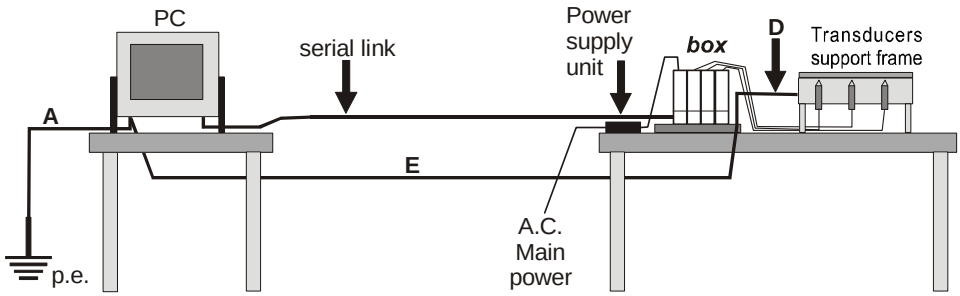
  The whole *DigiCrown* system (control + measurement) has been placed on a single bench gauge.



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.

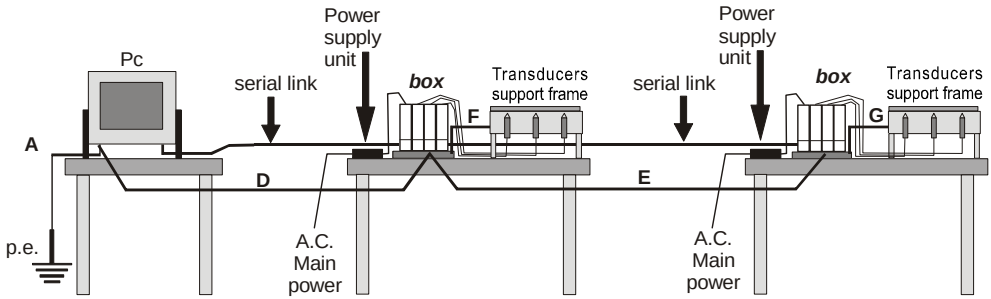
- **Bench application n. 2**

  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**.



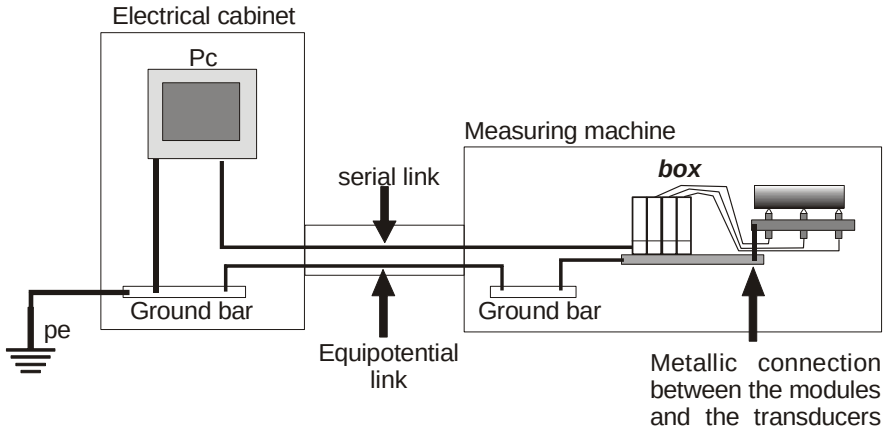
- **Bench application n. 3**

  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**.



- **<u>Automatic machine application</u>**

  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.



6. TECHNICAL SPECIFICATIONS

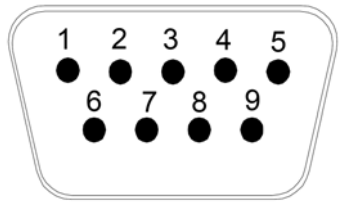
6.1. DigiCrown 232

DigiCrown 232	
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 ÷ +70°C
Protection degree	IP 43
Power supply	+7.5Vdc (-20% +30%)
Input	RS232 9-way sub D-type female connector
Dimensions	see Chapter 7

6.2. DigiCrown usb

	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	90 mA
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 7	

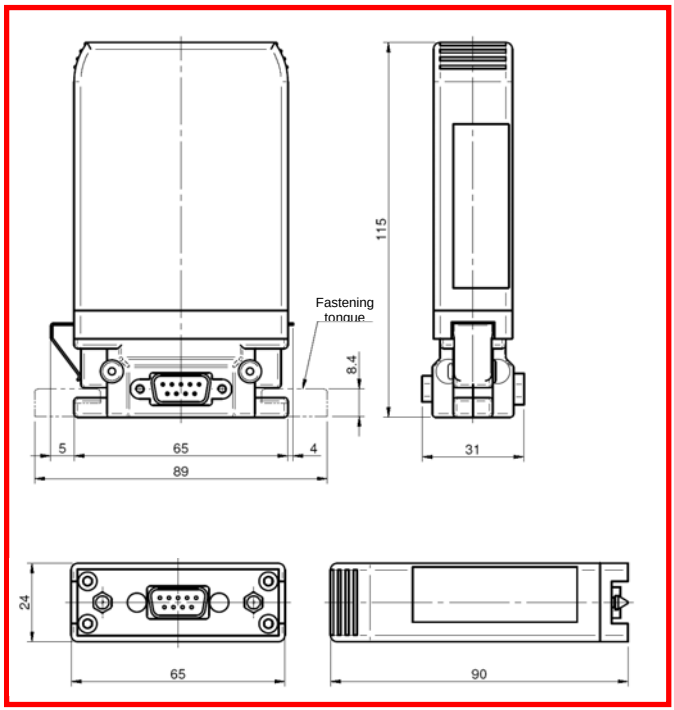
6.3. RS-232 connector pin-out *(9-Way D-Sub)*



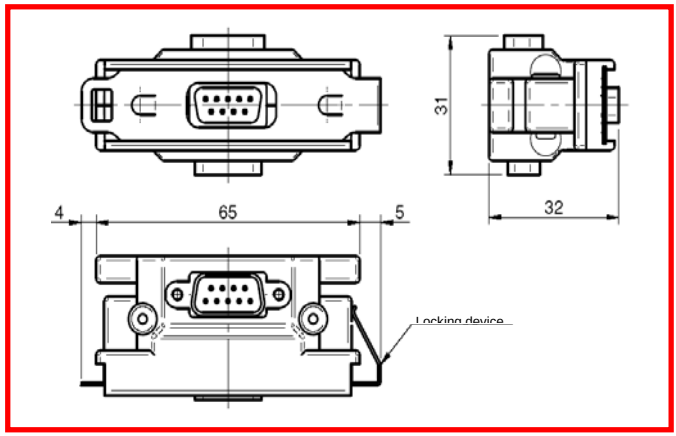
1 = NC
2 = TX
3 = RX
4 = NC
5 = GND
6 = NC
7 = CTS
8 = RTS
9 = NC

7. INSTALLATION DIAGRAMS

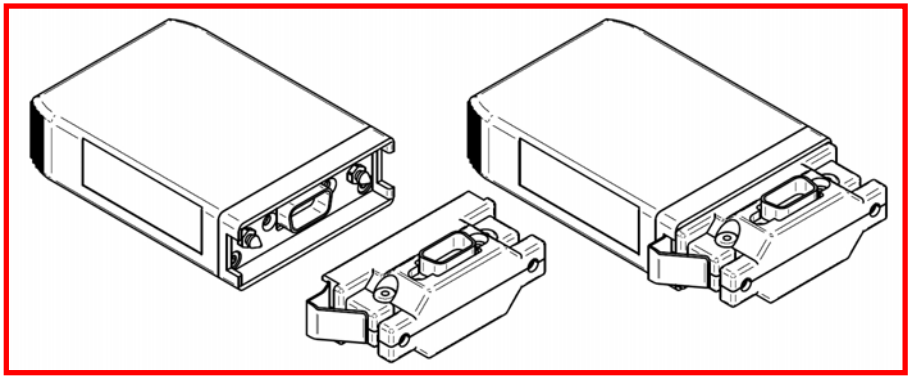
***232 and USB** modules*



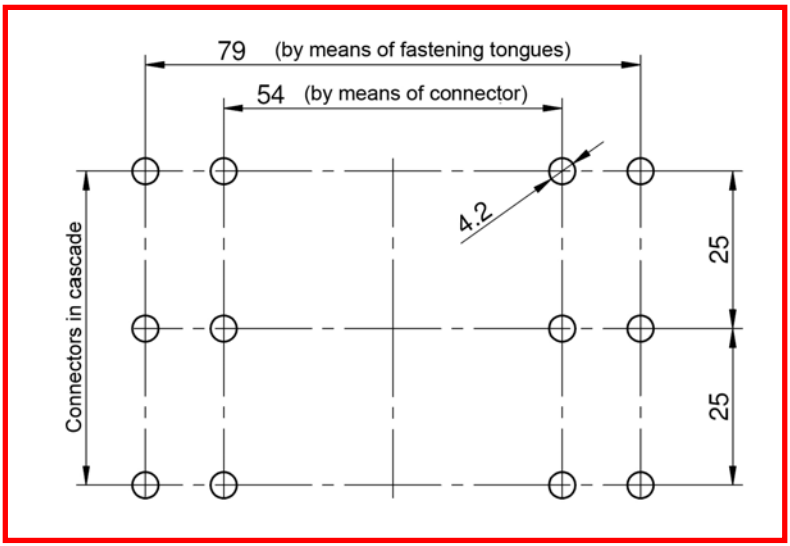
***Bus** module*



*Hooking of **232 and USB** module to **bus** connector*



Dimensions of fastening to stand



8. DECLARATION OF CONFORMITY

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

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

The devices have been designed, assembled and tested in compliance with the following European standards:

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

9. ORDERING CODES

The tables below are a general summary of the ordering codes for all the components of the *DigiCrown Probing Line*.

INTERFACES	
DESCRIPTION	**ORDER CODE**
DIGI CROWN BOX	767X000100
DIGI CROWN BOX + RAM	767X000210
DIGI CROWN BOX 2 TRANSDUCERS	767X200400
DIGI CROWN 232	767Y000100
DIGI CROWN USB HIGH SPEED	767Y010400
DIGI CROWN PSU (110-240VAC/7,5VDC)	767W000000
DIGI CROWN PSU (24VDC/7,5VDC)	767W010000
DIGI CROWN AI	767A000400
DIGI CROWN EI	767E010400
DIGI CROWN I/O SINK	767I000400
DIGI CROWN I/O SOURCE	767I010400
DIGI CROWN I/O ONLY INPUT	767I020400
DIGI CROWN PCI	6355321100
DIGI CROWN ISA	6355322100

EXTENSIONS	
DESCRIPTION	**ORDER CODE**
CONNECTION CABLE 2M	6738057016
CONNECTION CABLE 5M	6738057023
CONNECTION CABLE 6M	6738057024
CONNECTION CABLE 15M	6738057022
CONNECTION CABLE 25M	6738057017

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

SW PAKAGES	
DESCRIPTION	**ORDER CODE**
QUICK SPC	CM2Z32MA00
MDHQSPC V.3.2	CM2E32MA12
EASY ACQUISITION	CM2F23MA01
EASY ACQUISITION SPC	CM2F23MA02
MARPOSS DRIVER LIBRARY	CM2A14MA01

NOTE

 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

D4340032GF – *Edition 11/20010 – 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.