Índice

A1-HMI-QC121

1. Informations

1.1 Release

Document release	Description	Note	Date
01	New manual	Valid for hardware release from 02 and major release firmware starting from 5 🔧 Fix Me!	29/08/2012

The controller has been designed for industral environments in conformity to EC directive 2004/108/CE.

- EN 61000-6-4: Electromagnetic compatibility - Generic standard on emission for industrial environments
  - EN55011 Class A: Limits and measurement methods
    - EN 61000-6-2: Electromagnetic compatibility - Generic standard on immunity for industrial environments
      - EN 61000-4-2: Electromagnetic compatibility - Electrostatic discharge immunity
      - EN 61000-4-3: Immunity to radiated, radio-frequency electromagnetic field
      - EN 61000-4-4: Electrical fast transients
      - EN 61000-4-5: Surge immunity
      - EN 61000-4-6: Conducted disturbance induced by radio-frequency
      - Moreover the product is conform to the following standards:
        - EN 60529: Housing protection rating IP64
        - EN 60068-2-1: Environmental testing: Cold
        - EN 60068-2-2: Environmental testing: Dry heat
        - EN 60068-2-14: Environmental testing: Change of temperature
        - EN 60068-2-30: Environmental testing: Cyclic damp heat
        - EN 60068-2-6: Environmental testing: Sinusoidal vibration
        - EN 60068-2-27: Environmental testing: Shock vibration
        - EN 60068-2-64: Environmental testing: Random vibration

2. Description

A1-HMI-QC121 is a operator panel of the Qpanel+ series, can be equipped with:

Standard equipments	
	Graphics LCD display 12.1" TFT-256 COLORS-800x460px
	Resistive Touch Screen Panel
	1 PROG PORT serial program port (Use with IQ009 accessory)
	1 multistandard (RS232/422/485) serial - USER PORT
	1 Memory Card MMC/SD reader
	4 signal leds
	8 system leds
	Anti-vibrating spring clamps
	Clock calendar
	Interchangeable front label
	Customizable function keys
Optional equipments (See the table Hardware versions)	
	16 digital inputs
	2 analog inputs
	2 bidirectional counters AB
	8 digital outputs

2.1 Ordering code

	The Ordering Code provides the exact product features.

Model				Features				
A1-HMI-QC121	-	**01**	/	**TP01**	/	**CG2**	/	**24**
								24 = Power supply 24Vdc
						CG2 = Specialization cards		
				TP00 = Keyboard code (TP00 = resisitive touch-screen panel, logo and customizable function keys); **TP01** = resisitive touch-screen panel, logo and QEM function keys				
		01 = Firmware version (00 = not installed)						

A1 = HMI family
HMI = Human Machine Interface
Q = Qpanel series
C = Panel Graphic colors
104 = Graphics LCD display 12,1" TFT-256 COLORS-800x600px; front panel dimensions (264x336mm); keyboard with 6 keys+ 10 leds; box with standard DIN 43700

A1 = HMI family
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2.2 Product Label

- **a - Ordering Code**
- **b - Week made**: indicates the week and year of manufacture
- **c - Part number**: unique code that identifies an ordering code
- **d - Serial number**: product serial number, different for individual product
- **e - Hardware release**: version of hardware release

2.2.1 Hardware Versions

Is available the following versions:

Model	Features			
	Digital inputs	**Bidirectional counters 20KHz AB (24V-PP)**	**Analog inputs 12bit**	**Protected digital outputs**
A1-HMI-QC121-01/TP01/24V	-	-	-	-
A1-HMI-QC121-01/TP01/D08/24V	8	-	-	8
A1-HMI-QC121-01/TP01/G16/24V	16	-	2	8
A1-HMI-QC121-01/TP01/CG2/24V	12	2	2	8

2.3 Product Configuration

2.3.1 Front Panel
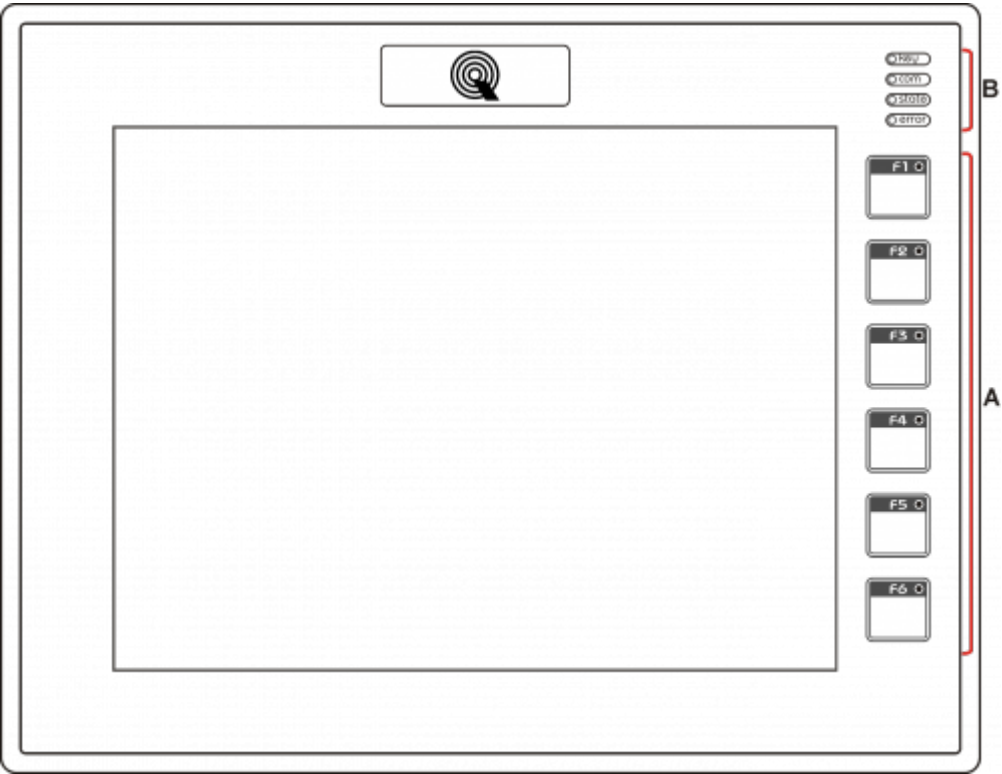
A) Function keys and led's
B) System led's

2.3.2 Back terminal blocks

The A1-HMI-QC121 has the specialization card.

3. Technical features

3.1 General features

Weight (full hardware)	2Kg
Housing	Sheet metal
Front panel	Alluminium
Outer Frame	Self-extinguishing Noryl
Display	LCD TFT 12.1" TFT-256 COLORS-800 x 600px
Touch screen	wire Resistive
Display dimensions	246.0 x 184.5mm / 12.1"
User led's	6
System led's	4 to front panel, 8 on rear
Function keys	6
System keys	3
Operating temperature	0 ÷ 50°C
Relative humidity	90% condensate free
Altitude	0 - 2000m s.l.m.
Transport and storage temperature	-25 ÷ +70 °C
Front protection rating	IP64

3.2 Dimensions

Lenght in mm.
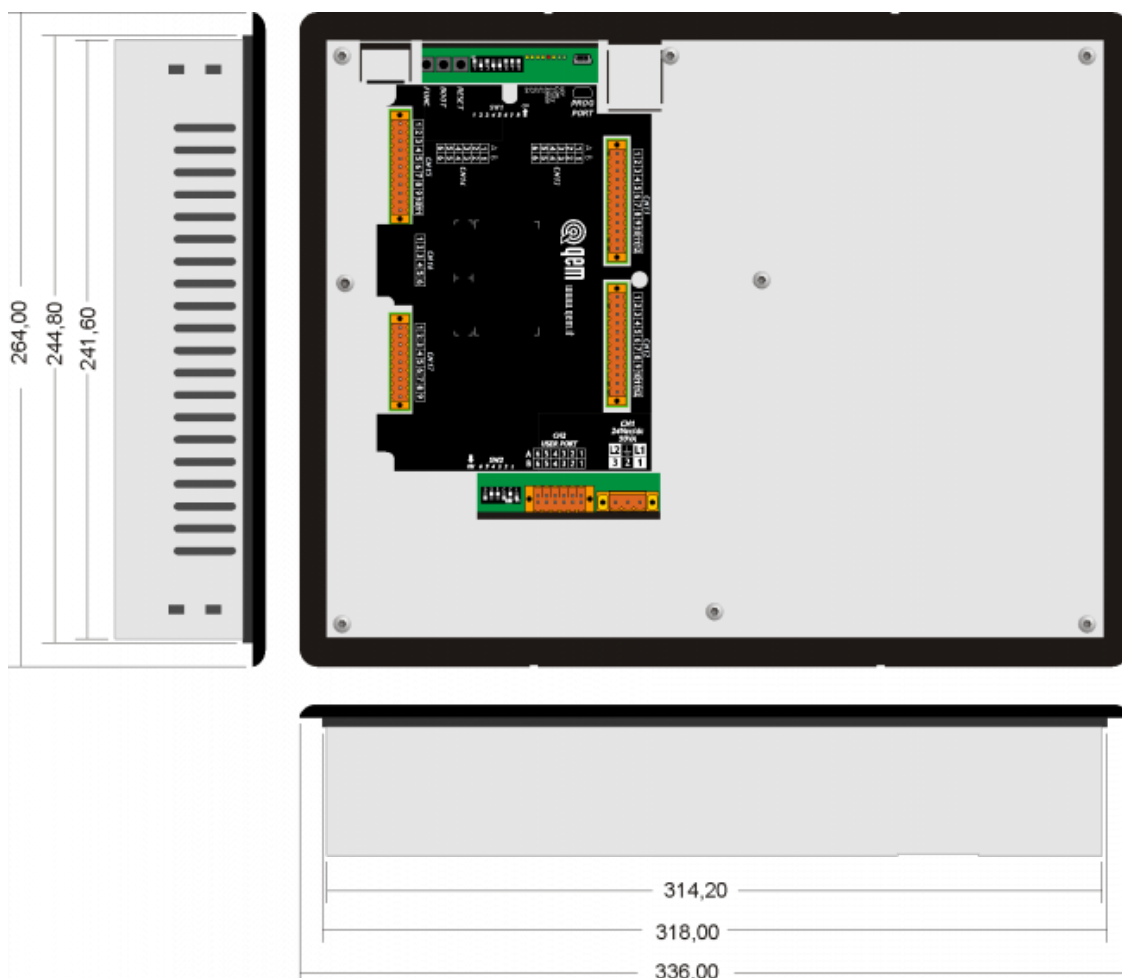
3.3 Hole template
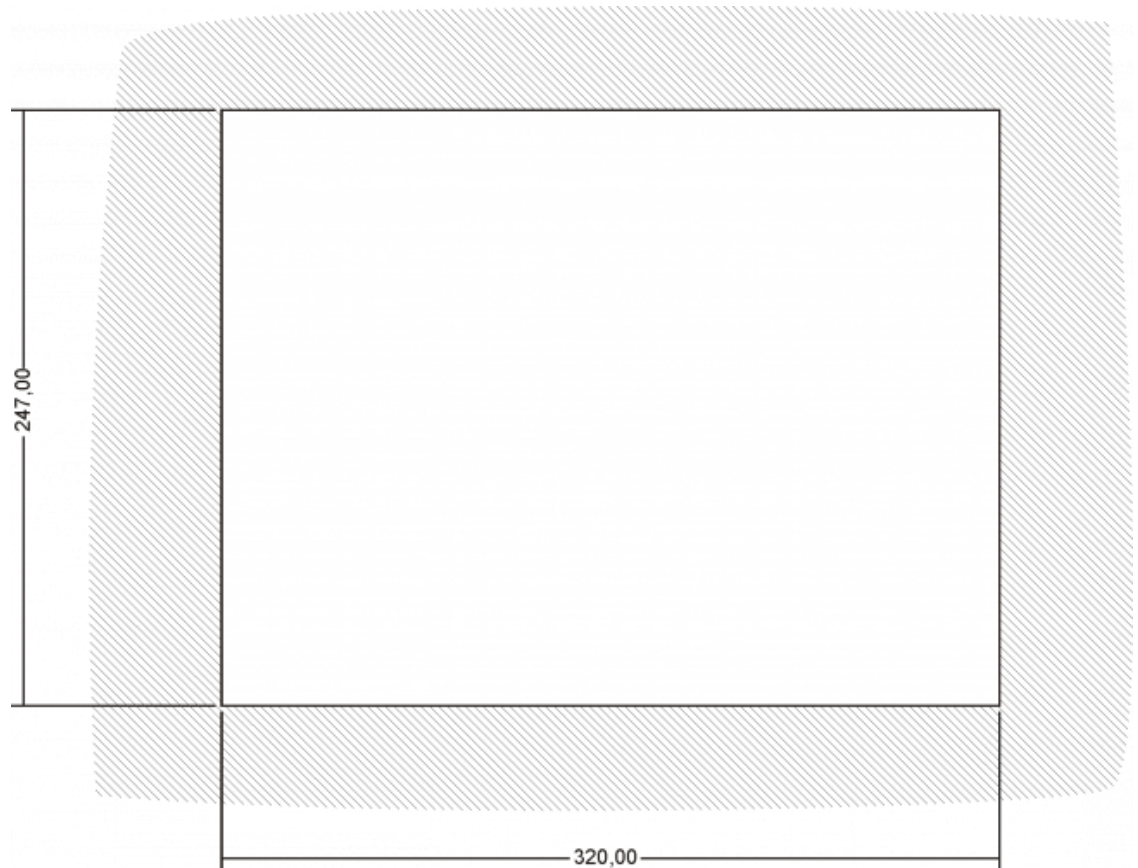
Fit the controller in the hole.

Apply the brackets.

⚠	**Before fixing the controller, check it is mounted firmly in the hole and the gasket under the frame makes a good seal. No liquids must enter and the frame must not deform.**
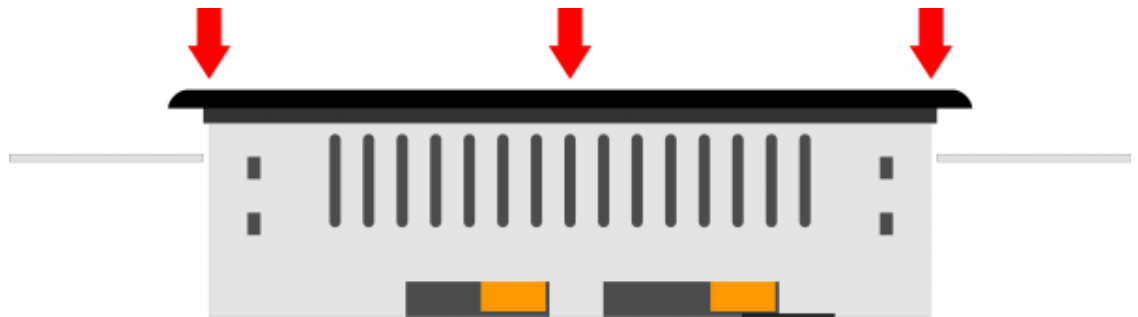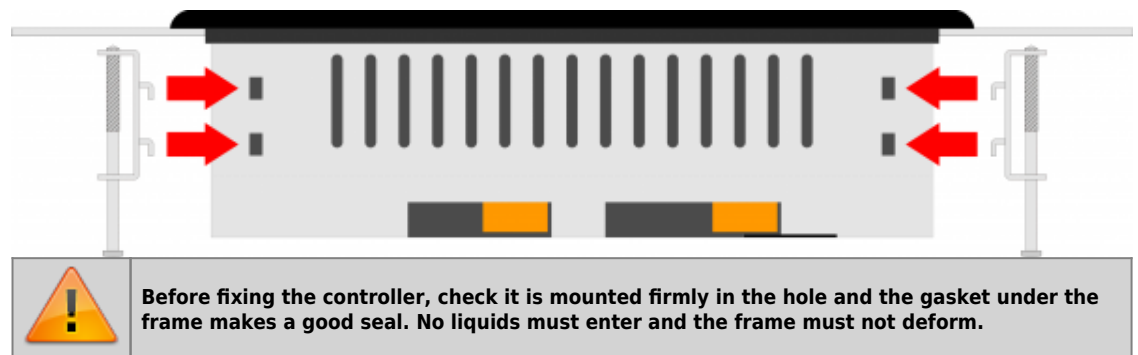
Screw the controller in place.
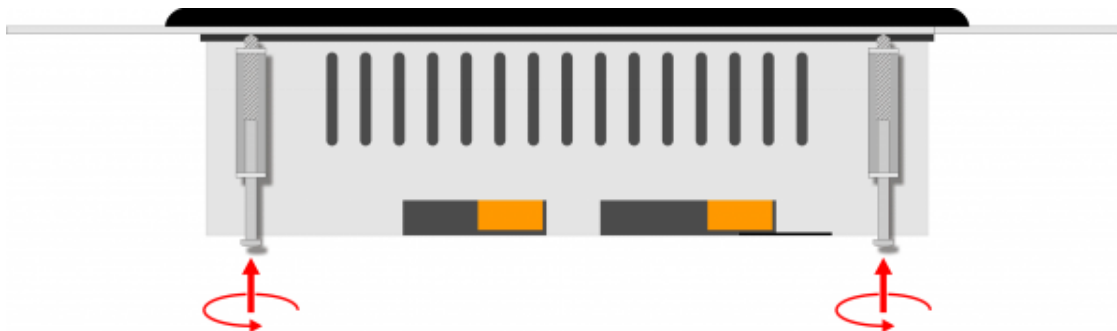
⚠	**Warning: after putting the pin of fixing, do only half rotation to not tear the frame!**
⚠	• **Please read carefully.** • **See technical notes on Weidmuller terminals BLZF, BLZ and B2L.**

Types of Connectors

	Family	Wire Section no end caps	Wire section with end caps	Characteristics of contact	Tools
	BLZF 3.5	0.3-1.50 mm^2	0.3-1 mm^2		Open the self-locking, spring clip terminals with a flat blade screwdriver to DIN 5264-A as shown below See the table below for recommended cap ends To crimp the cap ends to the wire use the tool below
	B2L 3.5	0.3-1.00 mm^2	0,3-0.5 mm^2		
	BLZF 5.08	0.3-2.50 mm^2	0.3-2.00 mm^2		
	BLZ 5.00	0.2-2.50 mm^2	0.1-1 mm^2		The screw terminals can be tightened with a flat blade screwdriver to DIN 5264 as shown in fig.4.7 Tightening torque: 0.4 - 0.5 Nm.

For a safer cabling, always use wire end caps

Tools

End caps

Wire section	End cap section	Make	Model
0.1-0.3 mm^2	0.95 mm^2	Cembre	PKE 308
0.3-0.5 mm^2	1.32 mm^2	Cembre	PKE 508
		BM	BM00601
1 mm^2	2.5mm^2	BM00603	PK 108
		BM	BM00603

End cap crimping tool

Use a crimp tool type "Cembre ND#4 cod. 2590086"
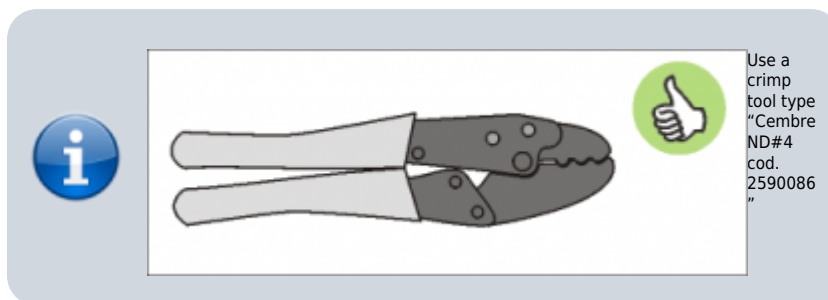
Screwdrivers

Screwdriver for tightening screw terminals:

A = .6 mm

B = 3.5mm
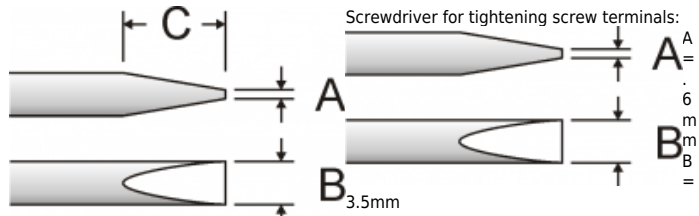
Screwdriver for opening self-locking spring
clip terminals:
A = 0.6mm
B = 2.5mm max
C = 7 mm min

Procedure
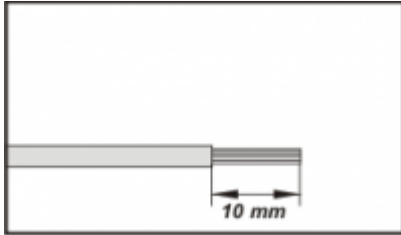
Strip 10mm of copper wire
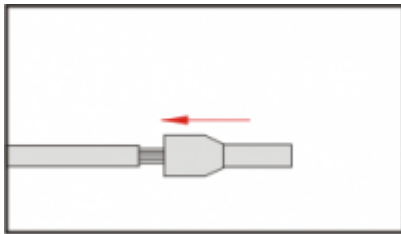
Fit the end cap and crimp it with a crimping tool
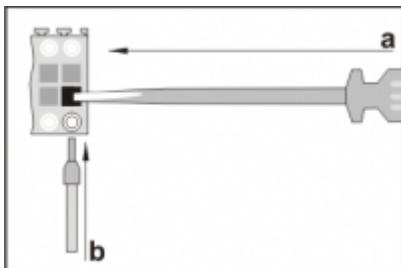
a) fit the screwdriver without turning it
b) fit the cable in the terminal
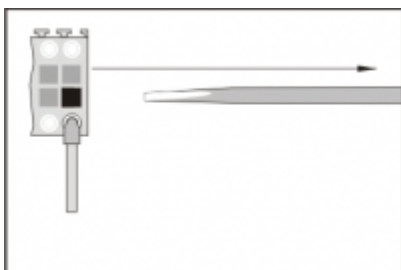
Remove the screwdriver

4. Electrical features and connections
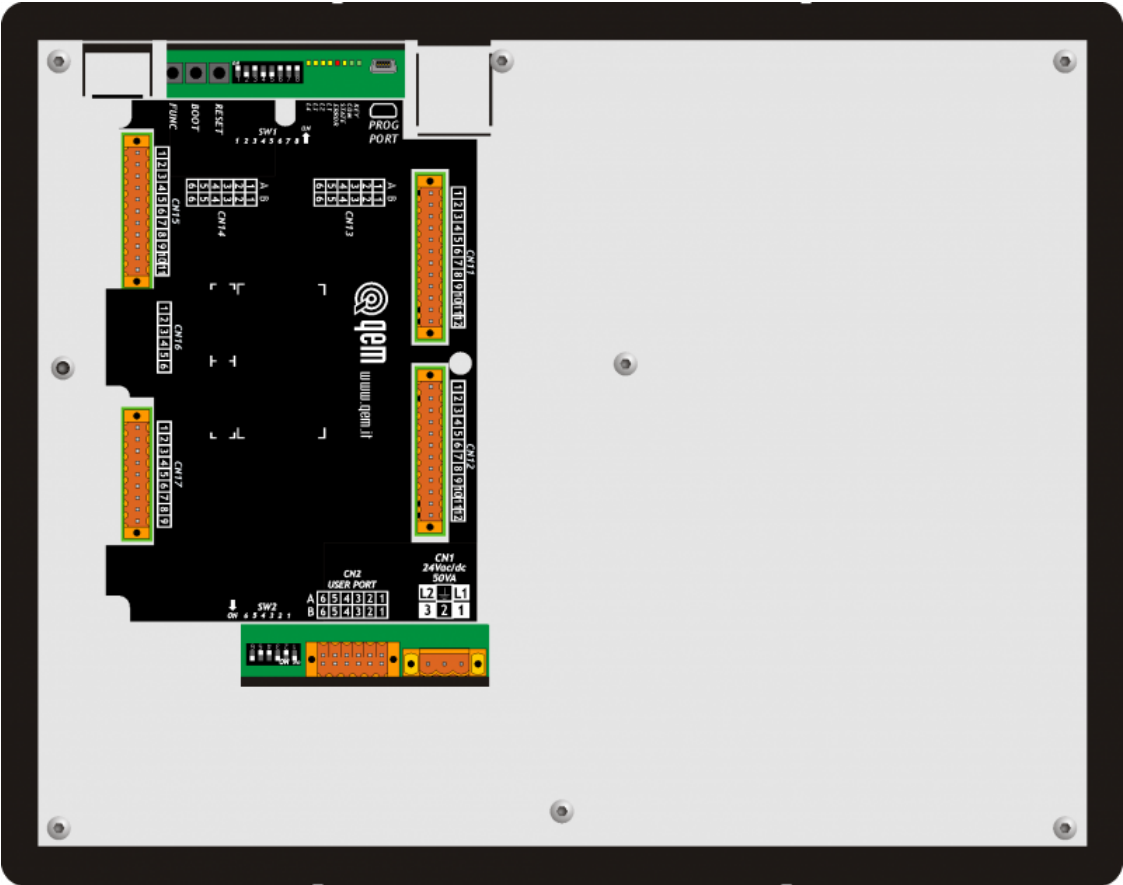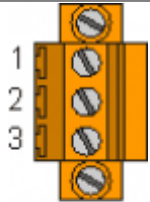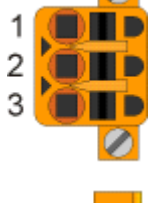
4.1 Power supply
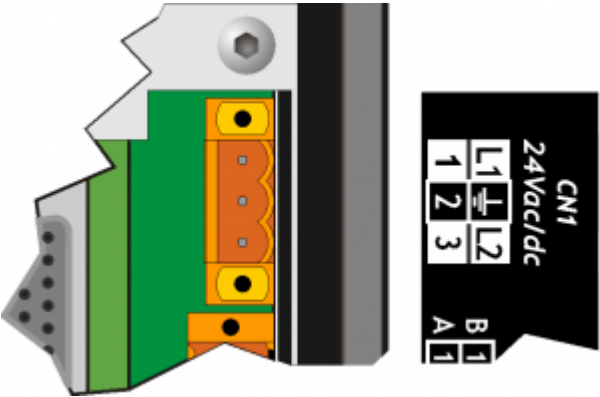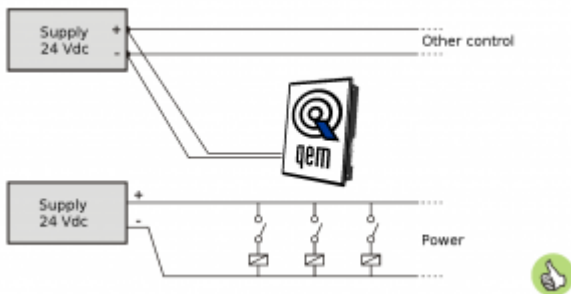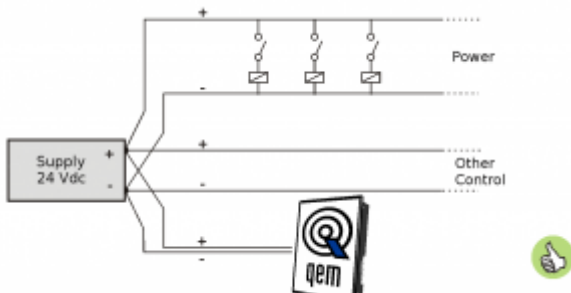
	The cabling must be carried out by specialist personnel and fitted with suitable anti-static precautions. Before handling the controller, disconnect the power and all parts connected to it. To guarantee compliance with EC regulations, the power supply must have a galvanic isolation of at least 1500Vac.

Power supply	24 Vdc
Voltage range	22 - 27 Vdc
Max. absorption	30W

CN1	Terminal	Symbol	Description
	1	L1/+	DC power positive
	2	GROUND	Gnd-PE (signals)
	3	L2/-	DC power 0V
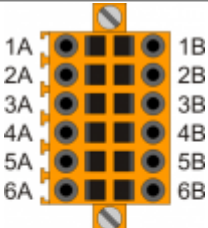
Connection examples for 24Vdc power supply

	Use an isolated power unit with 24Vdc +/-5% output conform to EN60950-1.

	Use two separate power units: one for the control circuit and one for the power circuit
	For a single power unit, use two separate lines: one for the control and one for the power

DO NOT use the same lines for the power circuit and the controller
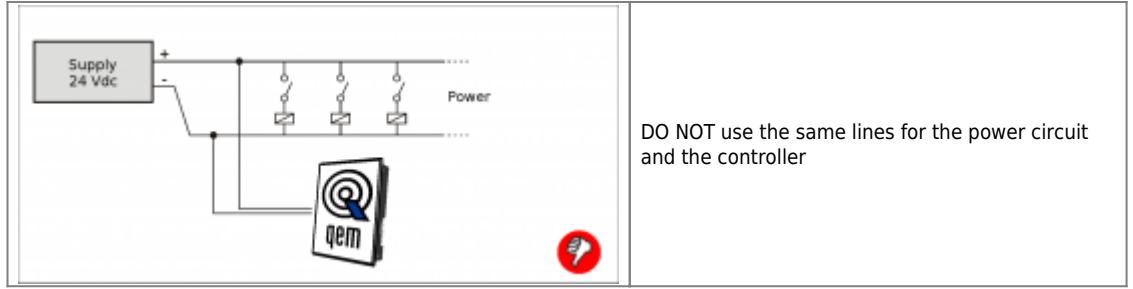
4.2 Serial connections

PROG PORT	Description
	Serial port used for the transfer and debugging of the application program in the CPU. Use only with IQ009 or IQ013.

CN2	Terminal	RS232	RS422	RS485	Description
	1A	-	-	A	Terminal A - RS485
	2A	-	-	B	Terminal B - RS485
	3A	0V	0V	0V	USER PORT common
	4A	0V	0V	0V USER PORT common	
	5A	TX	-	-	Terminal TX - RS232
	6A	Terra			
	1B	-	RX	-	Terminal RX - RS422
	2B	-	RXN	-	Terminal RX N - RS422
	3B	-	TX	-	Terminal TX - RS422
	4B	-	TXN	-	Terminal TX N - RS422
	5B	RX	-	-	Terminal RX - RS232
	6B	Ground			

Setup of USER PORT electric standard

SW2	Num. Dip	Name DIP	Setting of DIP			Function
	1	JP2	ON	X[1]	X[2]	Termination RS485
	2	JP3	ON	X[3]	X[4]	Polarization RS485
	3	JP1	ON	X[5]	X[6]	
	4		OFF	ON	OFF	Selection of USER PORT electric standard
	5		ON	OFF	OFF	
	6		OFF	OFF	ON	
			RS485	**RS422**	**RS232**[7]	

[1), 2), 3), 4), 5), 6)] X = setting not significant
[7)] the USER PORT can be used as PROG PORT with RS232 electric standard, setting ON in DIP-8 of SW1 and OFF in DIP-6 of SW2

Memory card slot (marked by an arrow)
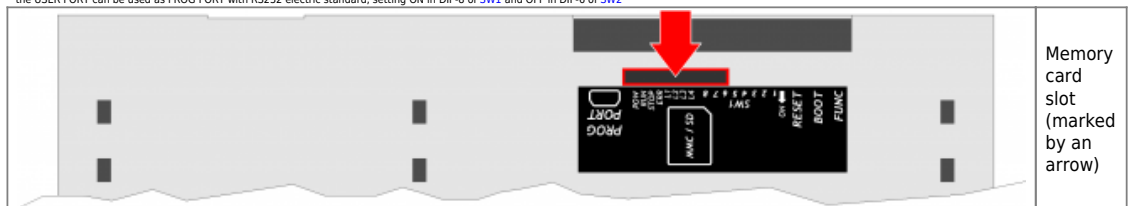
4.2.1 Serial connection features

Connector for IQ009 or IQ013

⚠	The USB mini-B connector does not support USB electrical standards, it can only be used with an interface IQ009 or IQ013.

It is used for the transfer and debugging of the application program in the CPU.

Electrical standard	TTL (Use serial interface IQ009 or IQ013)
Communication speed	Min. 9.6 Kbaud - max 115200 Kbaud settable by dip1 and 2 of the switch SW1
Insulation	None
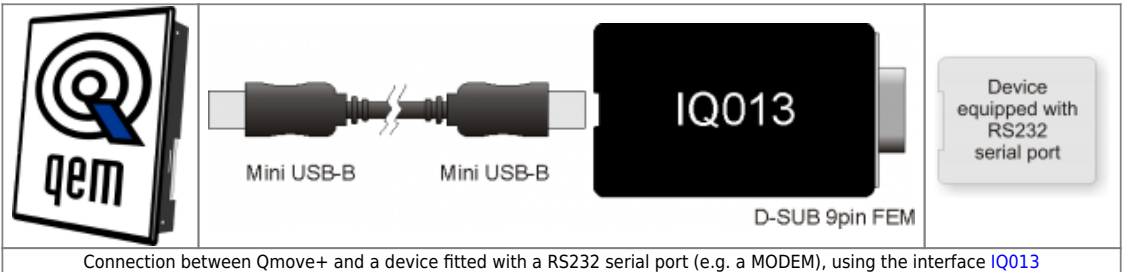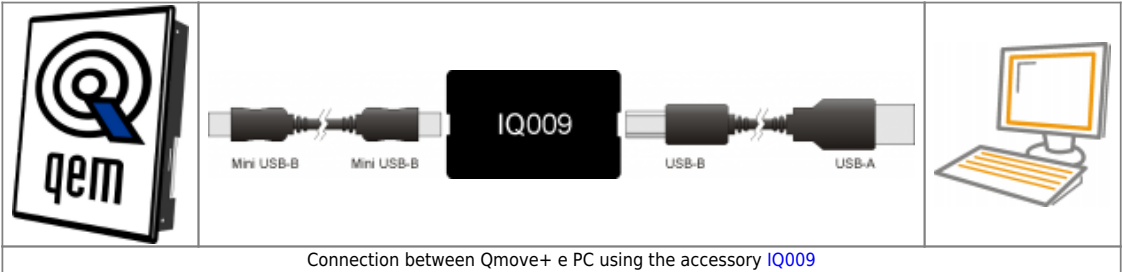
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Connection between Qmove+ e PC using the accessory IQ009

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Connection between Qmove+ and a device fitted with a RS232 serial port (e.g. a MODEM), using the interface IQ013

Communication speed	4800, 9600, 19200, 38400, 57600, 115200 baud
Communication mode	Full duplex
Operating mode	Referred to 0V
Max. number of devices connected on the line	1
Max. cable length	15 m
Input impedence	$\geq$ 3 Kohm
Short-circuit current limit	7 mA

Communication speed	4800, 9600, 19200, 38400, 57600, 115200 baud
Communication mode	Full duplex
Operating mode	Differential
Max. number of devices connected on the line	1
Max. cable length	1200 m
Input impedence	≥ 12 Kohm
Short-circuit current limit	35 mA

> To activate the internal termination resistance see paragraph **Setup of USER PORT electric standard**, **Setup of AUX1 PORT electric standard** or **Setup of AUX2 PORT polarization and termination resistances**

.

Communication speed	4800 baud (only if used with SERCOM and/or MODBUS device), 9600 baud, 19200 baud, 38400 baud, 57600 baud
Communication mode	Half duplex
Operating mode	Differential
Max. number of devices connected on the line	32
Max. cable length	1200 m
Input impedence	≥ 12 Kohm
Short-circuit current limit	35 mA
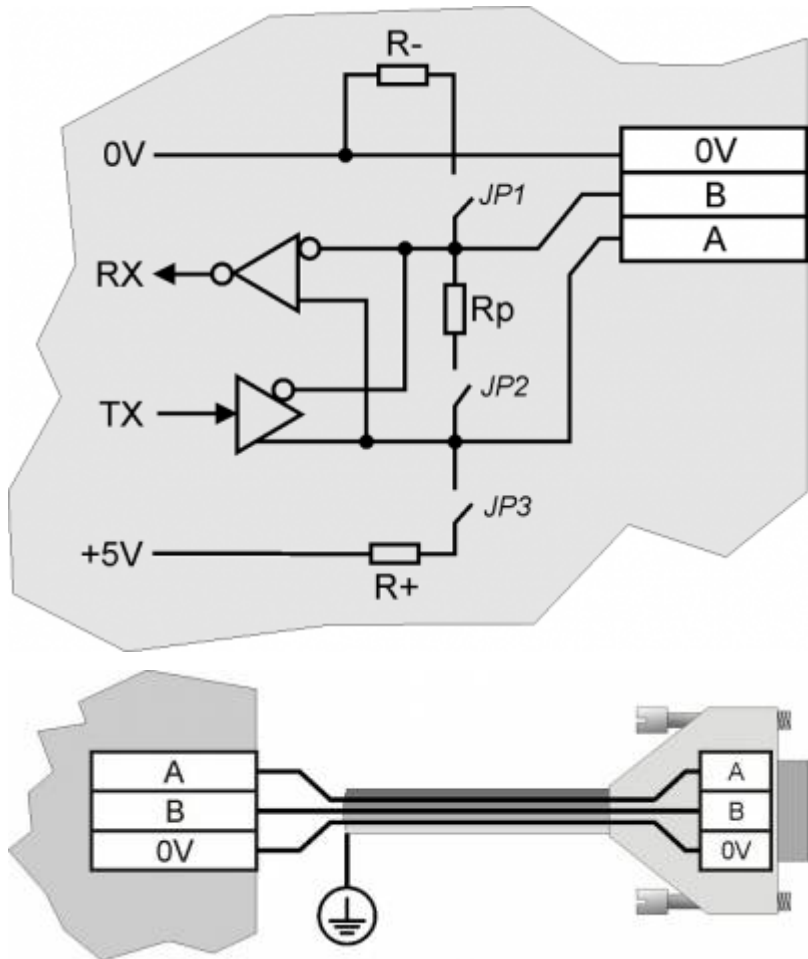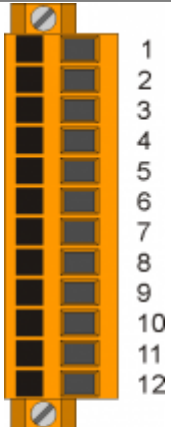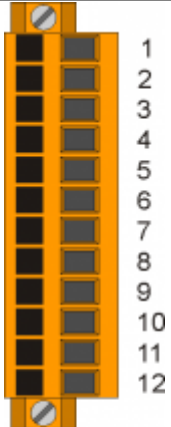
Type of Memory Card to use	MMC, SD and SDHC up to 8GB For proper operation it is necessary that the device conforms to the standards set by "SD Association" (www.sdcard.org) or "Multi Media Card Association" (www.mmca.org).

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> ⚠️ **To use the Memory Cards they must first be formatted with FAT16 or FAT32 file system.**

4.3 Specialization card

4.3.1 Digital inputs

4.3.1.1 16 digital inputs and 2 counter inputs

CN11	Terminal	Simbol	Description	Address
	1	-	Not used	
	2	-	Not uised	
	3	0V	Common of digital inputs	
	4	I1	Input I1	3.INP01
	5	I2	Input I2	3.INP02
	6	I3	Input I3	3.INP03
	7	I4	Input I4	3.INP04
	8	I5	Input I5	3.INP05
	9	I6	Input I6	3.INP06
	10	I7/PHA1	Input I7 or phase A of the first counter	3.INP07
	11	I8/PHB1	Input I8 or phase B of the first counter	3.INP08
	12	0V	Common of digital inputs	

CN12	Terminal	Simbol	Description	Address
	1	-	Not used	
	2	-	Not used	
	3	0V	Common of digital inputs	
	4	I9	Ingresso I9	3.INP09
	5	I10	Input I10	3.INP10
	6	I11	Input I11	3.INP11
	7	I12	Input I12	3.INP12
	8	I13	Input I13	3.INP13
	9	I14	Input I14	3.INP14
	10	I15/PHA2	Input I15 or phase A of the second counter	3.INP15
	11	I16/PHB2	Input I16 or phase B of the second counter	3.INP16
	12	0V	Common of digital inputs	

4.3.2 Analog inputs

The electrical features are given in paragraph Electrical features.
The wiring examples are given in paragraph Connection examples

CN17	Terminal	Symbol	Description	Address
	1	GAI	Common for analog inputs	
	2	IA1	Analog input 1	3.AI01
	3	SEL1V	Analog input 1 selector, voltmetric 0-10V [1]	
	4	SEL1C	Analog input 1 selector, amperometric 0-20mA [2]	
	5	GAI	Common for analog inputs	
	6	IA2	Analog input 2	3.AI02
	7	SEL2V	Analog input 2 selector, 0-10V voltmetrico [3]	
	8	SEL2C	Analog input 2 selector, 0-20mA amperometric [4]	
	9	VREF	Reference voltage	

[1,3] Wiring this terminal to GAI, the input functions as 0-10V voltmetric
[2,4] Wiring this terminal to GAI, the input functions as 0-20mA amperometric

4.3.3 Digital outputs

CN15	Terminal	Symbol	Description	Address
	1	V+	Outputs power in (12-28Vdc)	
	2	O1	Digital output 1	3.OUT01
	3	O2	Digital output 2	3.OUT02
	4		N.C.	
	5	O3	Digital output 3	3.OUT03
	6	O4	Digital output 4	3.OUT04
	7	V-	Outputs power in (12-28Vdc)	
	8	O5	Digital output 5	3.OUT05
	9	O6	Digital output 6	3.OUT06
	10	O7	Digital output 7	3.OUT07
	11	O8	Digital output 8	3.OUT08

4.4 Electrical features

The following are the electrical hardware features.
Maximum and minimum frequency values and actual acquisition times, can still depend on any additional software filters, see for example the system variable "QMOVE:sys004" in the section System variables.
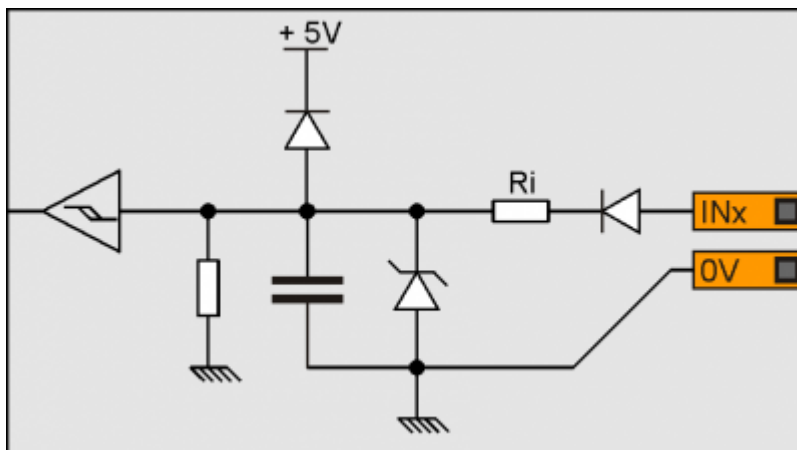
Type of polarisation	PNP
Min. acquisition time (hardware)	3ms
Isolation	1000Vrms
Rated operating voltage	24Vdc
Voltage of logic state 0	0-2 V
Voltage of logic state 1	10.5 - 26.5 V
Internal voltage drop	5V
Input resistance (Ri)	2700Ω
Sink current	2mA ÷ 8mA[1]

[1] **CAUTION: If the device connected to the inputs needs a higher minimum current, inputs may not work properly.**

Type of connection	Potentiometric 1KΩ-20KΩ
Resolution	12bit/16bit
Reference voltage output	2.5Vdc
Max output current from reference	10mA
Input resistance	10MΩ
Max. linearity error	$\pm$ 0,1% Vfs
Max. offset error	$\pm$ 0,1% Vfs
S.n.	71 dB
Update speed	1ms
Insulation	1000 Vrms
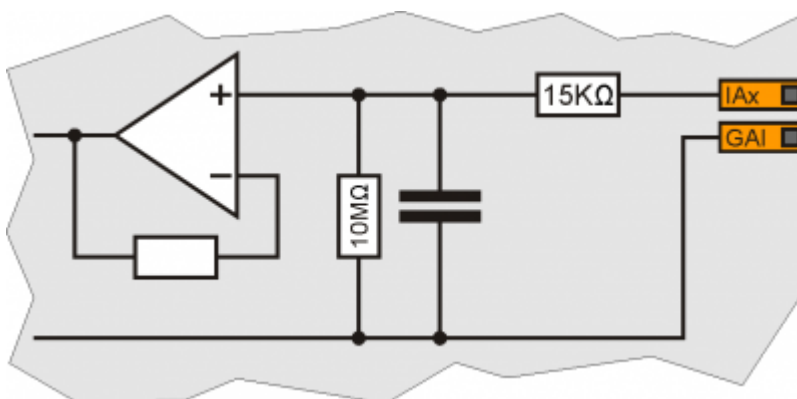
Type of connection	Voltmetric 0-10V
Resolution	12bit/16bit
Input resistance (Rin)	20KΩ
Damage value	20V
Max. linearity error	$\pm$ 0.1% Vfs
Max. offset error	$\pm$ 0.1% Vfs
S.n.	71 dB
Update speed	1ms
Insulation	1000 Vrms
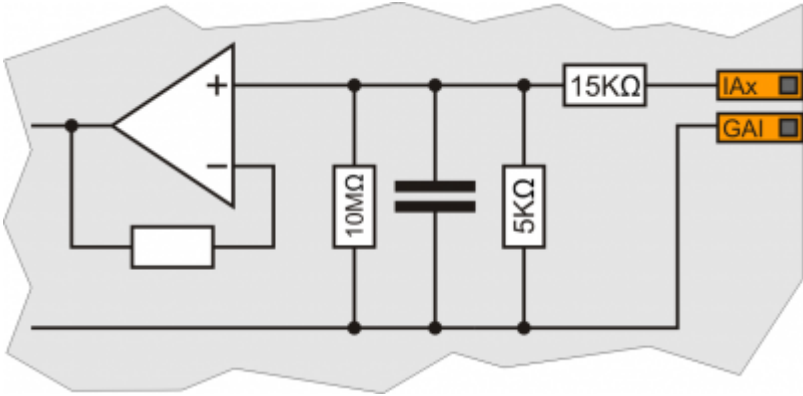
Type of connection	Amperometric (0-20 mA)
Resolution	12bit/16bit
Input resistance	125Ω
Damage value	25 mA
Max. linearity error	± 0,1% Vfs
Max. offset error	± 0,1% Vfs
S.n.	71 dB
Update speed	1ms
Insulation	1000 Vrms
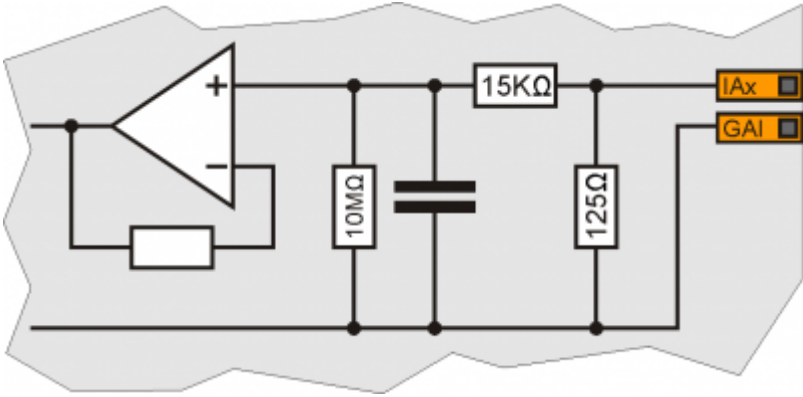
Switchable load	Dc (PNP)
Max. operating voltage	28V
Insulation	1000Vpp
Max. internal voltage drop	600mV
Max internal resistance @ON	90mΩ
Max. protection current	12A
Max. operating current	2A
Max. current @OFF	5μA
Max switching time from ON to OFF	270μs
Max switching time from OFF to ON	250μs
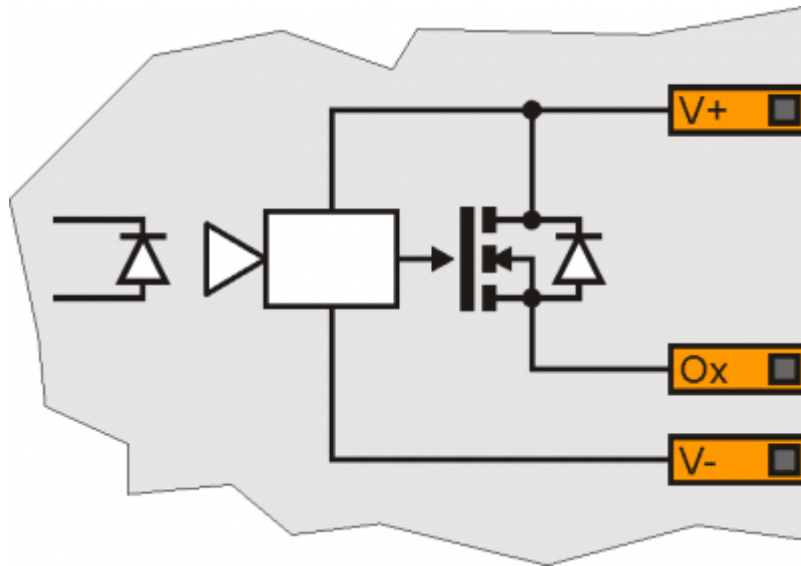
5. Connection examples

5.1 Digital inputs with encoder
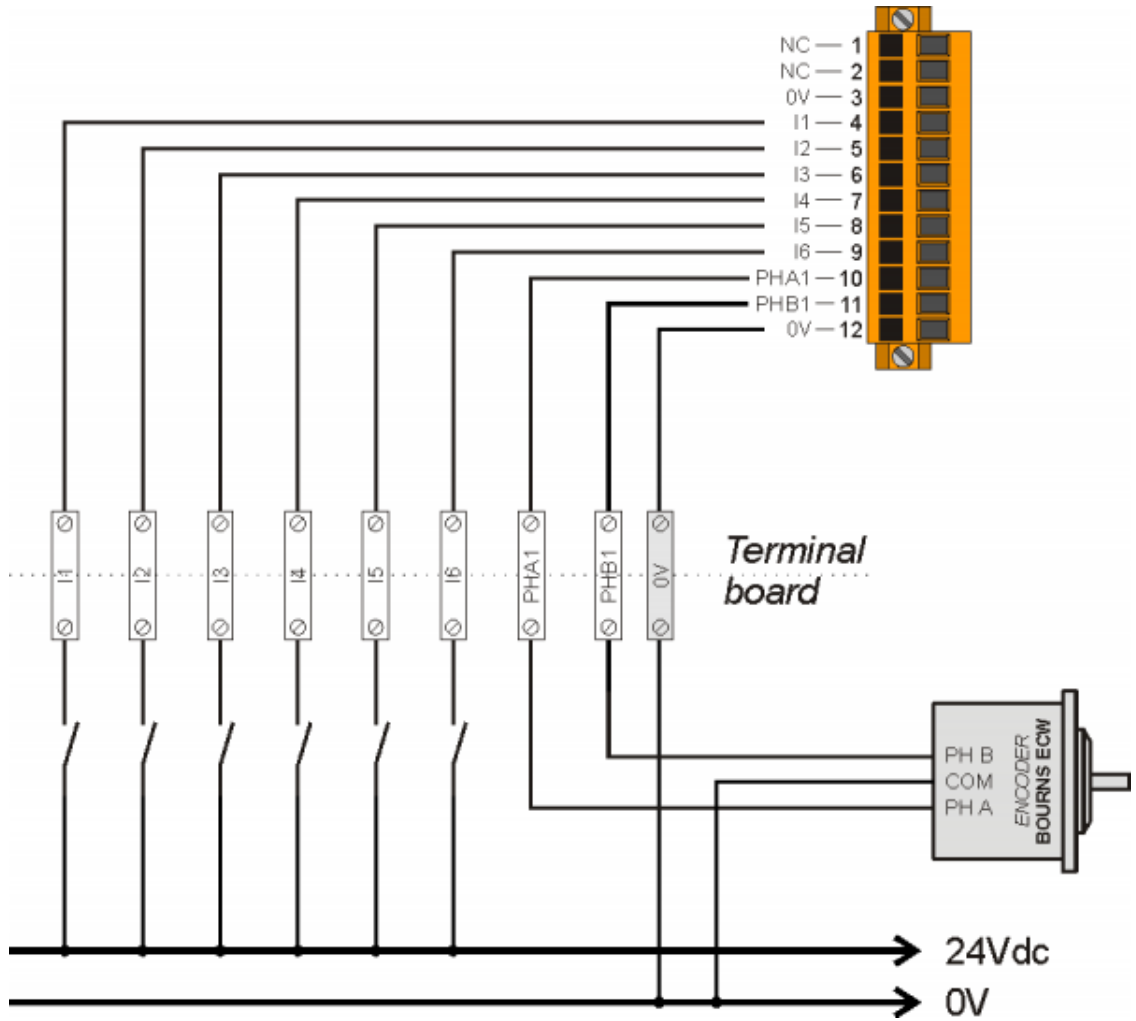
5.2 Voltmetric and amperometric analog inputs
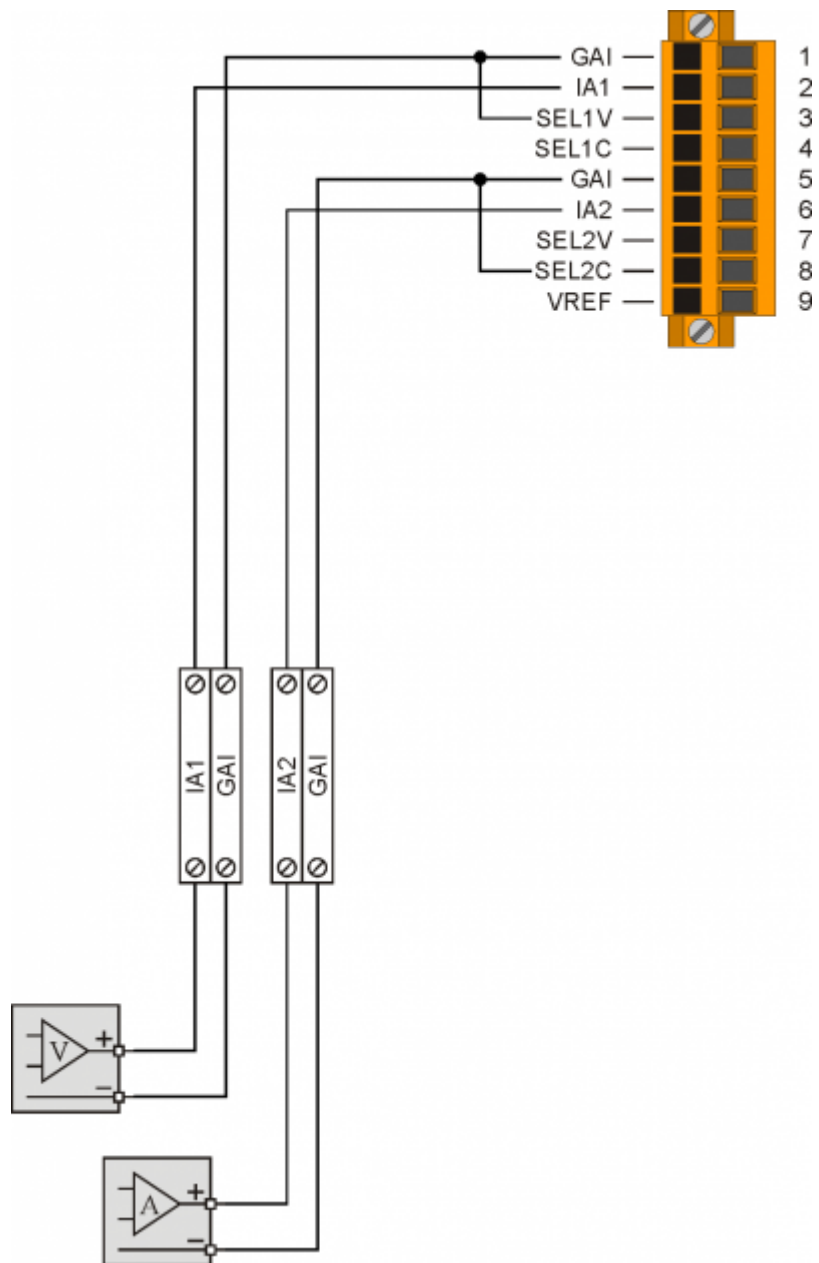
5.3 Voltmetric and potentiometric analog inputs
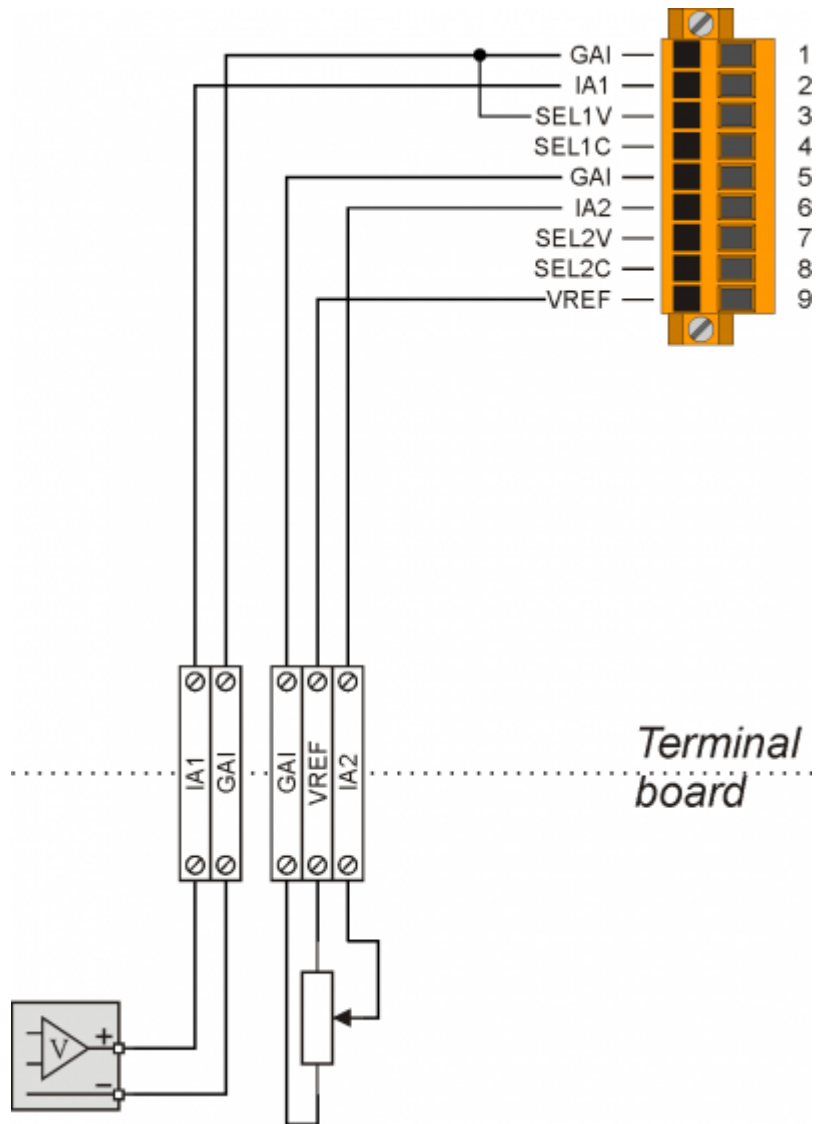
5.4 Protected digital outputs
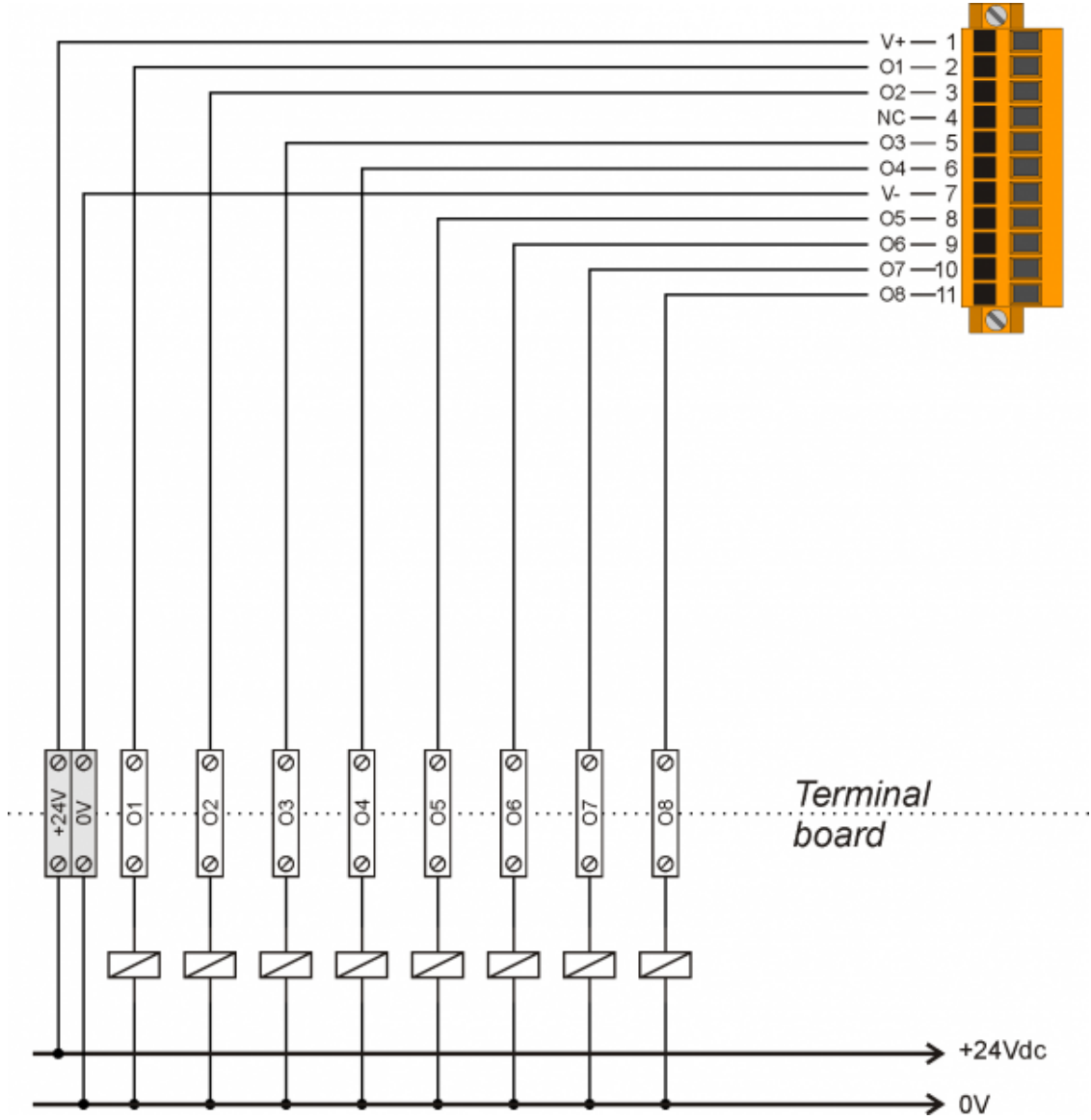
6. Settings, procedures and reports
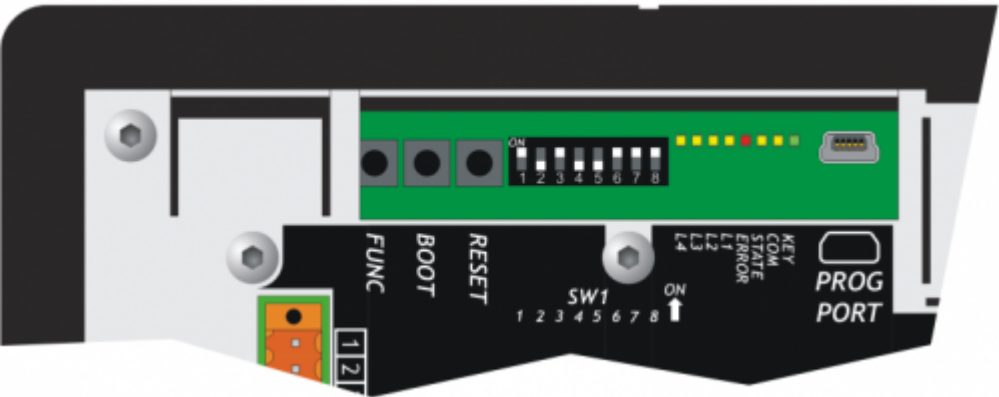
6.1 PROG PORT and USER PORT baud-rate selector

SW1	Dip	DIP setting				Function
	1	OFF	OFF	ON	ON	PROG PORT transmission speed selection
	2	OFF	ON	OFF	ON	
		Baud-rate 38400	Baud-rate 115200	Baud-rate 19200	Baud-rate 57600	
	3	OFF	OFF	ON	ON	USER PORT transmission speed selection
	4	OFF	ON	OFF	ON	
		Baud-rate 38400	Baud-rate 115200	Baud-rate 19200	Baud-rate 57600	
	5					Not used
	6					Not used
	7					Not used
	8	OFF		ON		Select the USER PORT as PROG PORT (the USER PORT can be used as PROG PORT with RS232 electric standard, setting to OFF the dip 6 of SW2).
		PROG PORT normal		PROG PORT on the connector of the USER PORT		

6.2 Leds

The **"key, com, state, error"** leds are called system led, they are found on both the front panel and on the back of HMI.
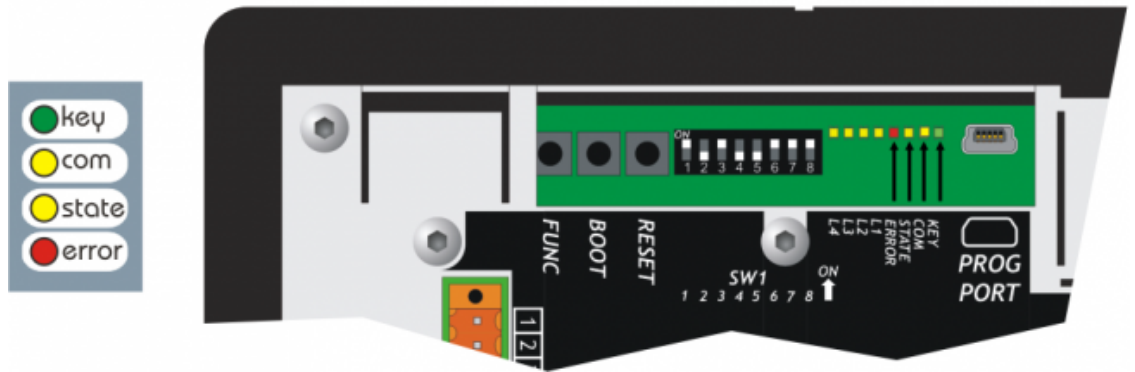
The user **"L1, L2, L3** and **L4"** leds are found only on the front panel:
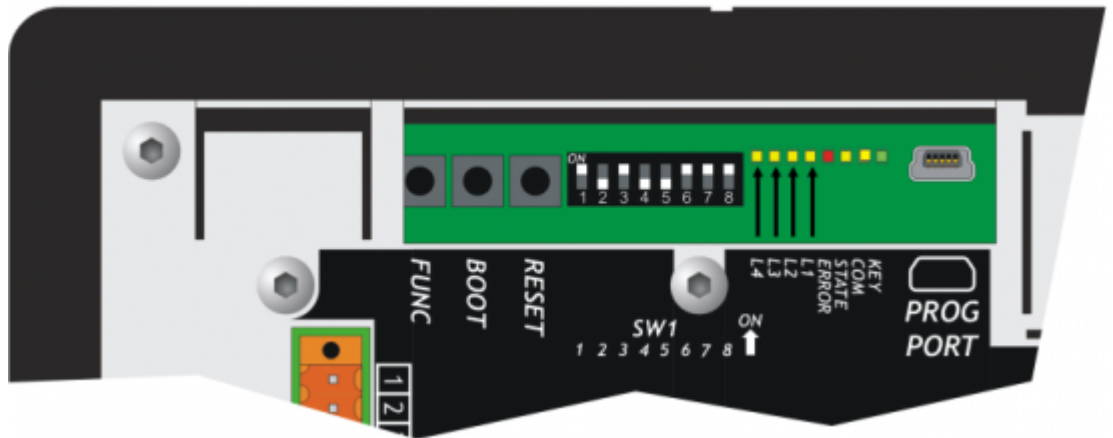
6.2.1 Segnalazioni "Led di sistema"

6.2.1.1 Legend:

Led ON

Led OFF

Led Flashing

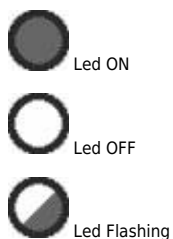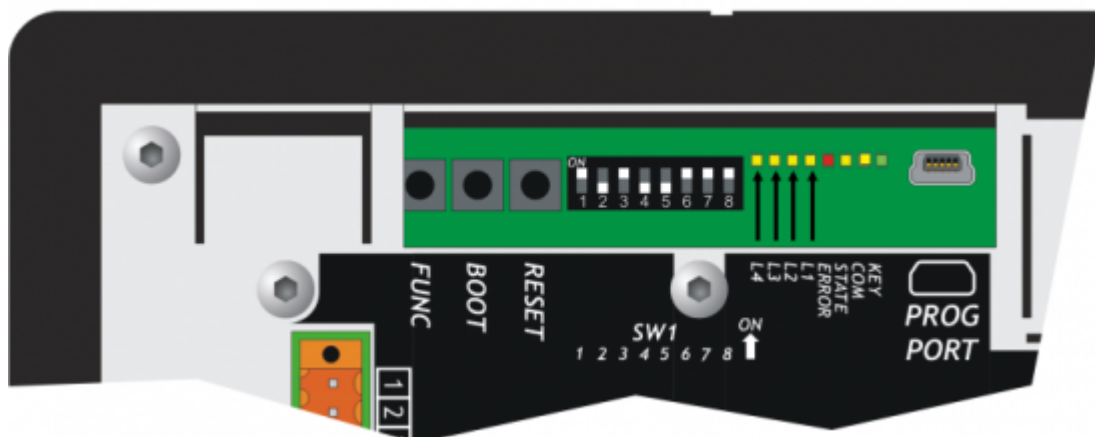| Led	Color	State	Description
key	Green		Always on. Turns off when at least one key is pressed.
com	Green		If on, indicates that the connection between the Terminal and QMOVE is not active. The causes: no connection between the devices; mismatch of checksums between the Terminal and QMOVE applications; interference on the serial line. When the communication is restored, the led turns off.
state	Yellow		If an abnormality occurs during communication between the Terminal and the QMOVE, led blinking with a 2Hz frequency. The malfunction can be hardware source (missed connection, noisy line) or software errors (incorrect readings of QMOVE variables). The causes: **Time-Out** when the terminal does not receive the response from the QMOVE. **No match** when QMOVE application checksums are different from the file symbols used to build your application on the Terminal. **Read error** when the read requests are made to variables with index and that index is outside of the allowed values. **Write error** same for read error but for write operations. **Backup error** when the data backup command of the QMOVE is not successful **Restore error** when the command to restore data of thr QMOVE is not successful or when is given a command restore application and had not been previously backed up. When the status led is flashing you should check what was the error that produced it; This can be done by accessing the Info page of the SETUP to 'Com Status' command. The error and then the blinking is cleared only on shutdown or after you exit the SETUP.
error	Red		This led is on when it detects hardware problems that might lead to malfunction of the system. Contact the QEM.

6.2.2 Alerts "User Led"

Led	Color	Description
L1		Delete application
L2		Delete the application from the MMC/SD. The file must be named as: **appqtp.bin**
L1 L2	Yellow	Execute the calibration of the Touch Screen.
L3		No function
L4		No function

6.3 Keys
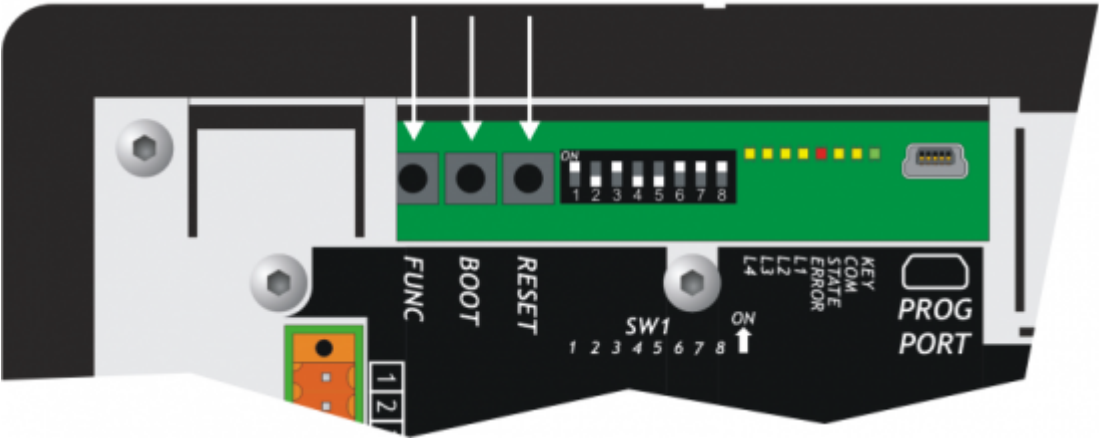
Name	Description
FUNC	Pressed enters or exit from the system functions
BOOT	Pressed execute the selected function
RESET	No function

7. General information of operation

7.1 Introduction

This chapter will introduce some concepts and describes some operations of the product. These contents are partly related and implemented in firmware. This software implements all features that allow the product to be a component of the system programmable Qmove.

7.2 Organizing data and memories

To best understand the terms used in this chapter, it is important to know the organisation of data and memory in a QMOVE application. QMOVE applications are programs written in QCL language that, translated in binary code, are transferred onto QMOVE hardware and saved there. In the hardware, the microprocessor runs has a program called firmware that interprets the above binary code instructions and performs the operations associated to them.

A QCL application, in addition to the instructions, is also composed of variables that the QCL instructions act on.. Some of these variables are retentive, i.e. their values remain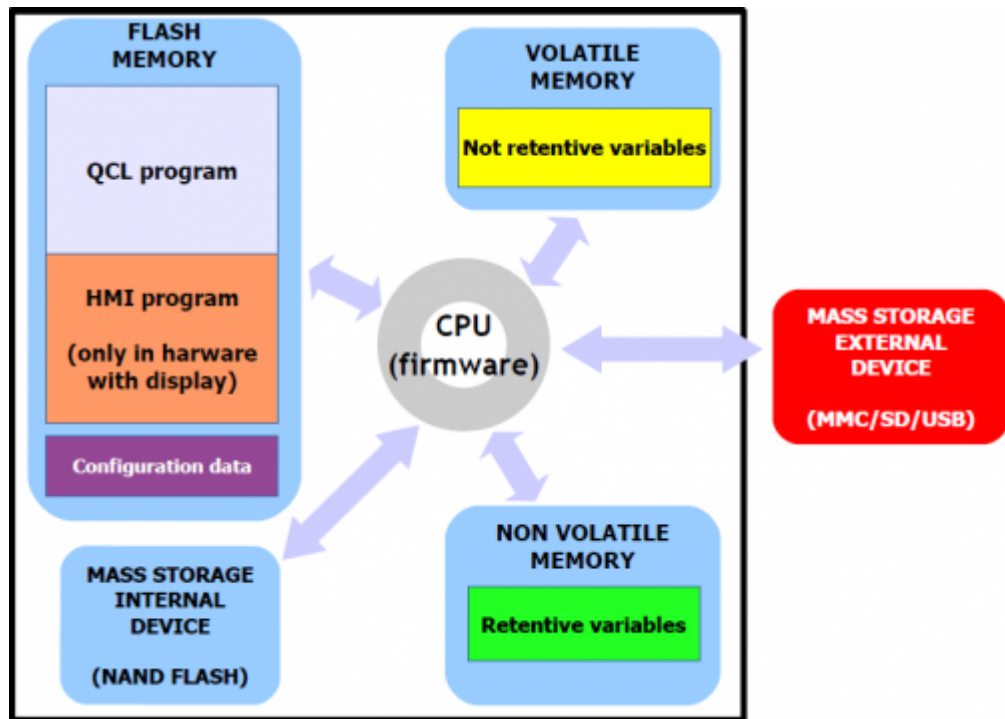 unaltered from shut-off to start up. The flow chart below illustrates the organisation of data in a QCL application transferred to the memory of any QMOVE hardware:

It can be noted that, the QMOVE hardware has several mass storage devices:

"Flash memory", where the following is saved:

- **QCL program:** the series of QCL instructions translated into binary by the compiler.
- **HMI program:** the series of HMI screens translated into binary by the compiler. This program only exists when the QMOVE hardware has a display.
- **Configuration data:** the calibration and configuration data, the touch-screen calibration settings, the ethernet communication configuration data (IP address, etc...), etc.

"Non volatile memory", which stores:

- **Retentive variables:** the group of variables that remains unaltered on a shut-off and startup (e.g. SYSTEM, ARRAYS, DATAGROUP, etc).

"Volatile memory", which stores:

- **Not retentive variables:** the group of variables that is set to 0 at each startup (e.g. GLOBAL, ARRGBL, etc).

The volatile data memory is also used as dynamic memory. i.e. the memory used by the firmware for internal operations and active HMI screen management.

"Mass storage internal device" is managed by a standard filesystem and is useful to save information by the DATASTORE device (read - write binary or csv files with recipes, logs, variuous setups, etc).
It 'also used to store the backup of the application QMOVE and other service files.

"Mass storage external device" is managed by a standard filesystem and is useful for loading the QMOVE application, data loading/saving, firmware update or to save informations by the DATASTORE device.

7.3 SETUP PAGE

⚠	**ATTENZIONE: WARNING: The use of these procedures is potentially dangerous (see for example the application delete) and it is preferable that is carried out by a specialist supervision.**

The system functions are special procedures that allow the user to perform various operations such as setting/calibration of devices, saving/restoring data and application on/from removable devices, deleting the application and management of storage devices.

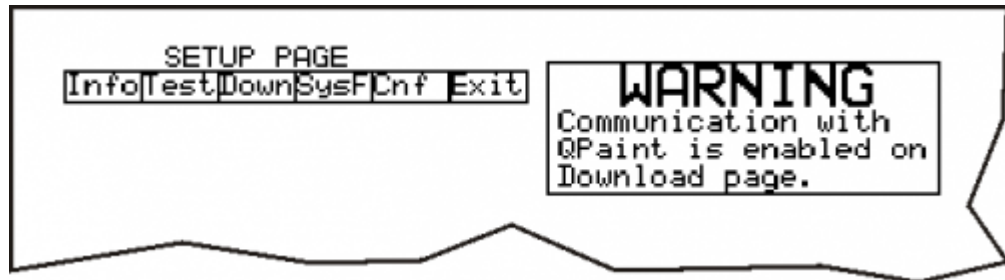To access the new system functions simply login to instrument SETUP.

Note: If there is no Terminal application software will automatically enter in SETUP.
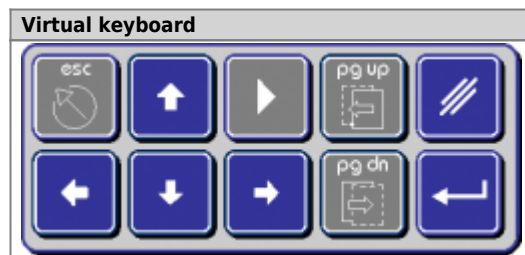
7.3.1 Procedure

To access in the **System functions**, press the **BOOT key** or press together the keys **"F2 + F4 + F6"**.

The following menu appears:

To select a function using the vertical arrows of the <u>virtual keyboard</u>, then press Enter for view the selected function. The system restarts and displays the system function selected.

Virtual keyboard

7.3.2 Setup page menu

Lists and describes all system functions.

7.3.2.1 Navigation keys

To enter/confirm the functions press ENTER key .

The UP and DW keys perform changes of values.

To switch from one page to another press PAGE DOWN key or PAGE UP key .

For exit from the menu press the ESC key .

Note: For exit from the system functions select "EXIT" from the main menu.

7.3.2.2 Info menu

7.3.2.2.1 INFO PAGE 1/6

7.3.2.2.2 FW code

Firmware code (es. HD010003)
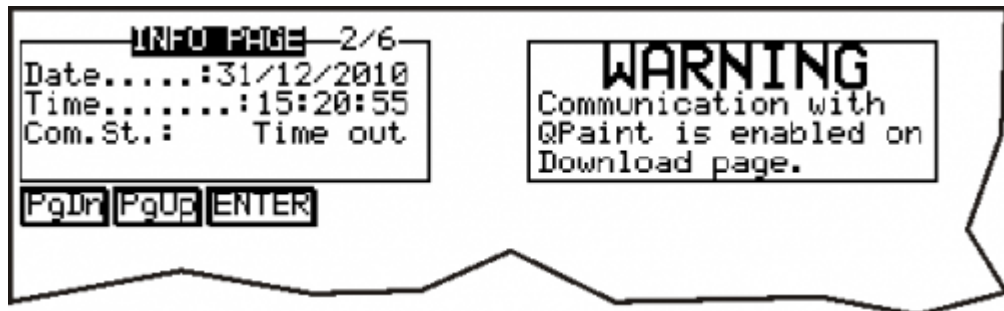
7.3.2.2.3 FW ver.

Firmware version (es. 01.0.3)

7.3.2.2.4 IF code

Data not available.

7.3.2.2.5 IF ver.

Data not available.

7.3.2.2.6 INFO PAGE 2/6

7.3.2.2.7 Date

System date.

The ESC key is inhibited until the confirmation of all the fields by pressing the ENTER key.

7.3.2.2.8 Time

System clock.

The ESC key is inhibited until the confirmation of all the fields by pressing the ENTER key.

7.3.2.2.9 Com.St.

Reports the status of the serial communication. If everything is OK the message: **0k**
If the 'COM' led is ON and the'STATE' led flashing, the connection between the HMI and the QMOVE is not active. The reasons can be:

Checksum wrong Appears the 'No match' message, which means that the application built for the Terminal is not compatible with the QMOVE software and then the communication is not established because it may create incompatibilities in data of the system. The 'No match' condition excludes communication problems due to connection errors or problems related to serial ports.

Communication interrupted Appears the 'Time Out' message, which means that the terminal not received response or the response has not been received completely. If the 'COM' led is ON it probably means there is a malfunction of one of the two devices (QMOVE or HMI) or connection between the device. If the 'COM' led is OFF means that at least one 'Time Out' occured from the power ON (example an electrical noise).

Reading errors Appears the 'Read Error' message, which means that the the response string to a reading didn't the correct syntax of the Protocol. This can happen if the Terminal makes a request of a variable with index out of range. For example the read request of an element of an array, where the value of i is greater than the size of the array itself; if i is a constant value that the compiler of the application can inspect and report the error, but if i is the value that is contained in a variable can take place such an error.

Writing errors Appears the 'Write Error' message, which means that the response string to a reading didn't the correct syntax laid down in the Protocol. All that has been described for the readings also applies to torn writes

Backup error Appears the 'Backup Error' message, which means that the QMOVE application data backup operation is not successful.

Restore error Appears the 'Restore Error' message, which means that the restore operation of data of the QMOVE application is not successful.

7.3.2.2.10 INFO PAGE 3/6
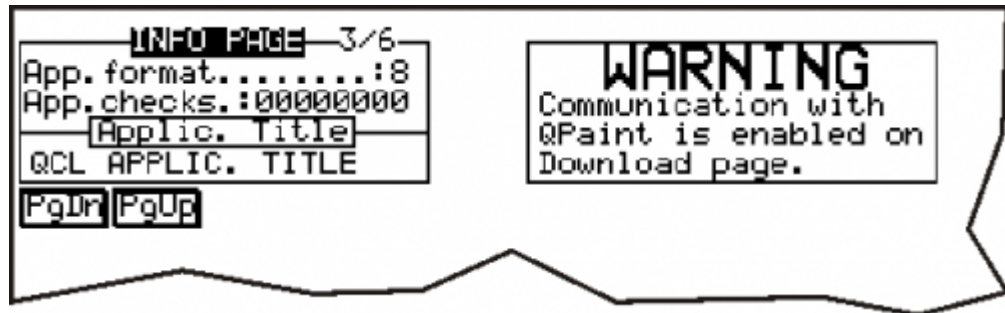
7.3.2.2.11 App.format

Identifies the type of application file format. It is used to prevent the execution of applications with a format that is not compatible with the firmware. (Is an information used only by the development "QPaint" software).
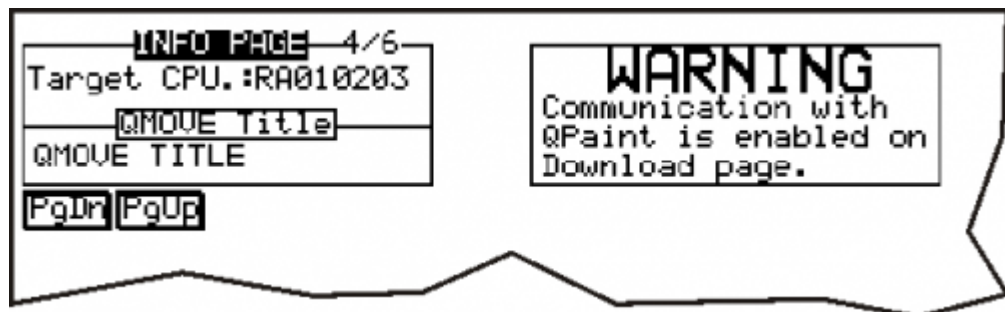
7.3.2.2.12 App.checks

The value allows you to uniquely identify a particular application. It is computed on the information used in the download of the application.

7.3.2.2.13 App.title

Is a string that is set in the configuration "Qpaint" program to identify the application. Cannot be changed.
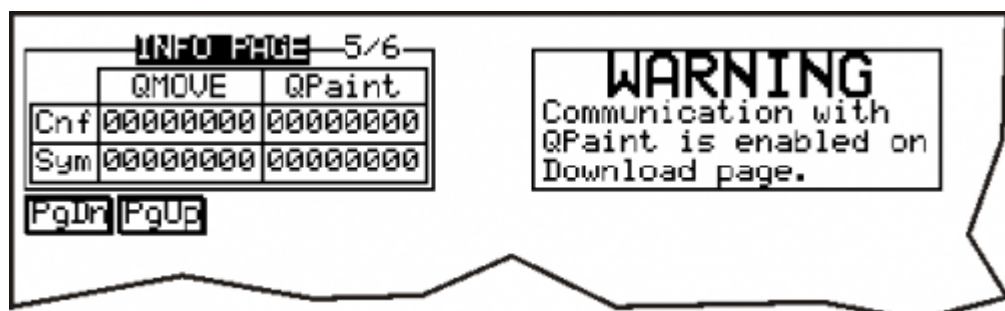
7.3.2.2.14 INFO PAGE 4/6

7.3.2.2.15 Target CPU

You see the CPU type connected with the Terminal. This information is detected with a reading from the Qmove CPU.

7.3.2.2.16 Qmove Title

Is the application title exists in the Qmove CPU. This information is detected with a serial reading by Qmove CPU.

7.3.2.2.17 INFO PAGE 5/6

7.3.2.2.18 Checksum table

You see the checksum file configuration and application Qmove symbols and symbols which the application has been generated. The first is read with the serial from the CPU, the second is a value contained in the data download.
If the checksum do no match, the connection isn't enabled between the Terminal and Qmove variables. (see "no match error or incorrect Checksum").

7.3.2.2.19 INFO PAGE 6/6
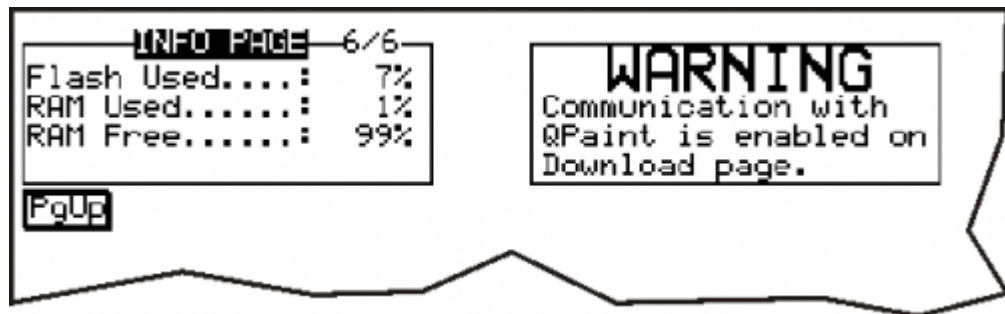
7.3.2.2.20 Flash Used

The value refers to the space occupied in the flash memory of QPaint project. The value is the same to the one displayed on the download page.

7.3.2.2.21 RAM Used

The value refers to the space occupied in the RAM memory from the current page displayed by the terminal before logging on to the Setup. The value refers to all structures allocated to run the page.
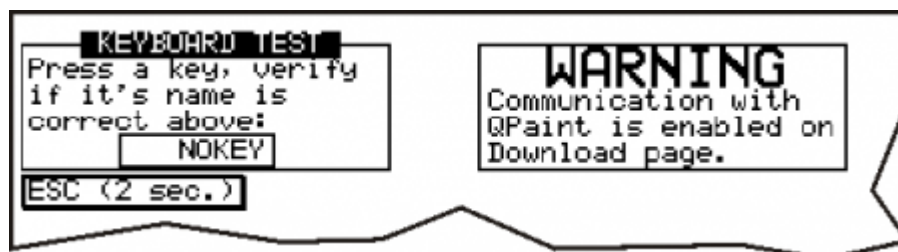
7.3.2.2.22 RAM Free

The value refers to the free space of the RAM memory. The sum of the first and third value, indicates the total RAM memory space.

7.3.2.3 Test Menu

The HMI has the following test procedures to assist the operator:
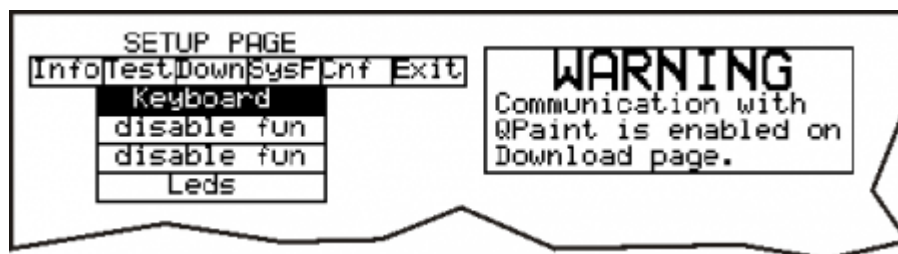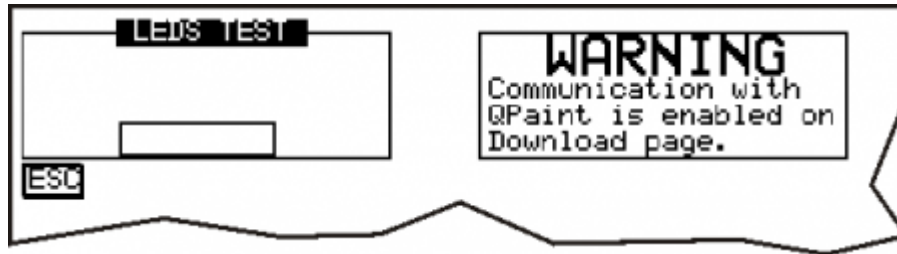

7.3.2.3.1 Keyboard

At the pressure of any button you see the message.

For exit press and hold the "ESC" key for 2 sec.

7.3.2.3.2 Leds

The function key leds are activated in succession with variable frequency.
Don't execute the system leds test ("Key", "Com", "State", "Error") because the function it isn't programmable and because their indications are not essential to the functionality.

7.3.2.4 Down Menu (Download)

The DOWNLOAD procedure allows the Terminal to receive the information needed to run the application designed by the user. The steps performed during the download procedure are:

1. Verifying the connection
2. Flash memory delete
3. Displays the size of your application to receive
4. Software download

7.3.2.5 SysF Menu (System Functions)

The entry in this menu is indicated by the following Leds:

Led ON	Color	Menù SysF description	System function	Description
L2		Delete App.	Application delete	Delete the application
L1 L2	Yellow	Upload MMC	Application upload from MMC/SD	CApplication upload from MMC/SD. The file must be named as: **appqtp.bin**
L3		Touch Calib.	Touch Calibration	The Touch Screen calibration.

For the description of functions see section System functions

7.3.2.6 Cnf Menu (Configuration)

The changes will be put into execution at the exit from the configuration page.

7.3.2.6.1 Config. Page 1/2
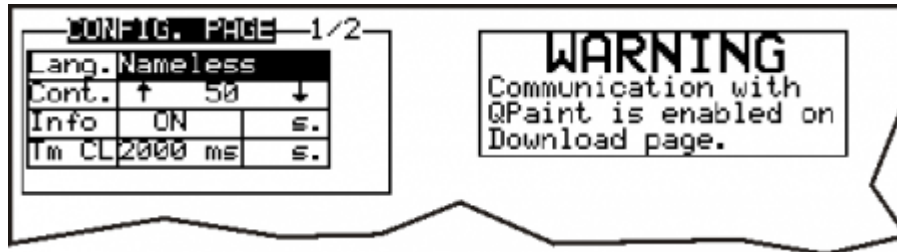
Each time you press the button ENTER key you jump from one sector to another sector.

Lang. Is the choice of the languages to be used. This array of strings is decided at design time in the Setup program.

**Cont.** Is the value of the display contrast.

Info Debug informations (default = OFF).

Tm CL CLEAR key time. During the dataentry, if the CLEAR button is pressed for longer than the time set the given typed is cleared. If the CLEAR button is pressed impulsively you cancel only one digit of the given type.

7.3.2.6.2 Config. Page 2/2
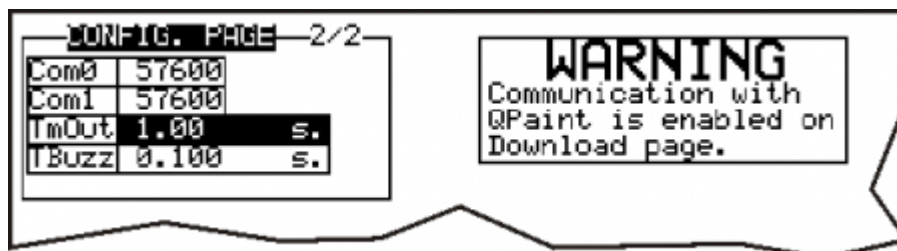
Depending on the firmware version can also exit this window:
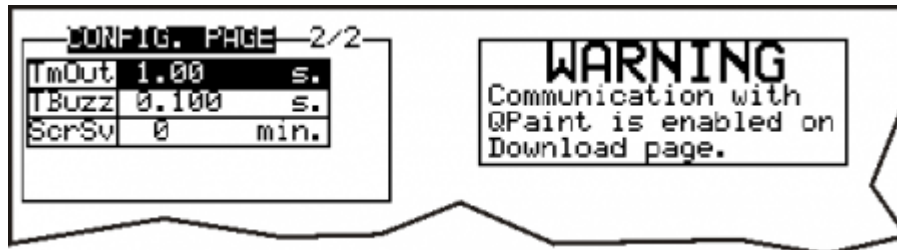
Com0 Serial port speed System.

Com1 Serial port speed AUX.

TmOut Timeout on request to the CPU (default = 1.00 s).

TBuzz Operating time of the buzz when press a button (default = 0.100 s).

ScrSv Screen-saver settings:
0 = disable (default). Display always on.
1..60 = switches off the display after pressing the buttons or touch after 1..60 minutes. Press any key or touch the display for resumes.

7.3.3 System functions

7.3.3.1 Delete App. function

SYSTEM FUNCTIONS

Application delete

Press BOOT or F5 for 2 sec. to execute
Press FUNC or F1 to EXIT

Press the **BOOT key/F5 key** for 2 seconds the the selected function is executed.	**BOOT**
The POW led starts flashing to indicate that the selected function is running.	**POW**
When the function ends the POW led stops flashing.	**POW**
Press the **FUNC key/F1 key** to exit from the function	**FUNC**

SYSTEM FUNCTIONS

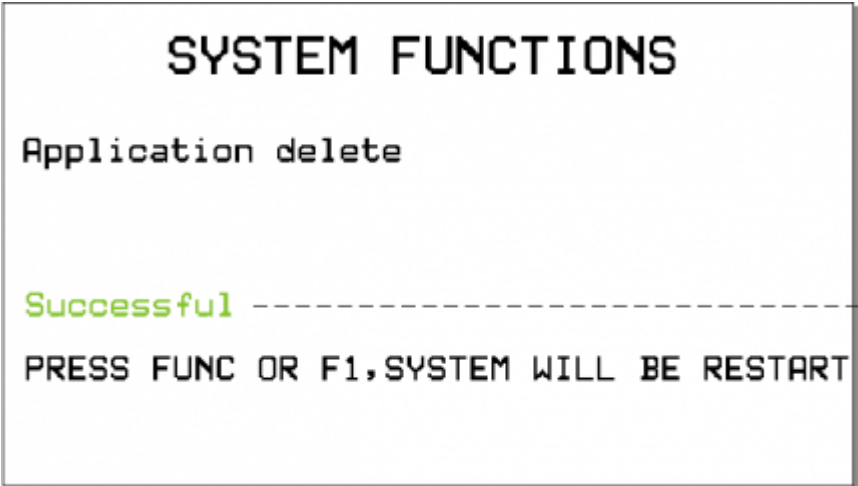Application delete ----- a

Executing...
Delete HMI Application ----- b
Progress: 100%

----- c

- **a** = indicates that the function is in running.
- **b** = task running.
- **c** = percentage of the function executed.

SYSTEM FUNCTIONS

Application delete

Successful --------------------------------d

PRESS FUNC OR F1,SYSTEM WILL BE RESTART

- **d** = indicates that the function was successful.

7.3.3.2 Upload MMC function

SYSTEM FUNCTIONS

Application upload from MMC/SD

Press BOOT or F5 for 2 sec. to execute
Press FUNC or F1 to EXIT
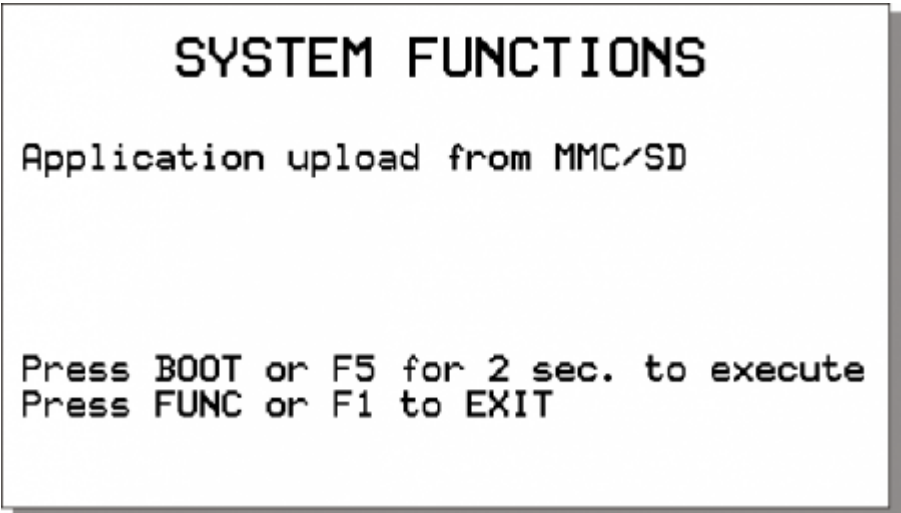
Press the **BOOT key/F5 key** for 2 seconds the selected function is executed.	**BOOT**
The POW led starts flashing to indicate that the selected function is running.	**POW**
When the function ends the POW led stops flashing.	**POW**
Press the **FUNC key/F1 key** to exit from the function	**FUNC**

SYSTEM FUNCTIONS

Application upload from MMC/SD ---------- a

Executing...
Upload HMI application ------------ b
Progress: 100%

---------- c
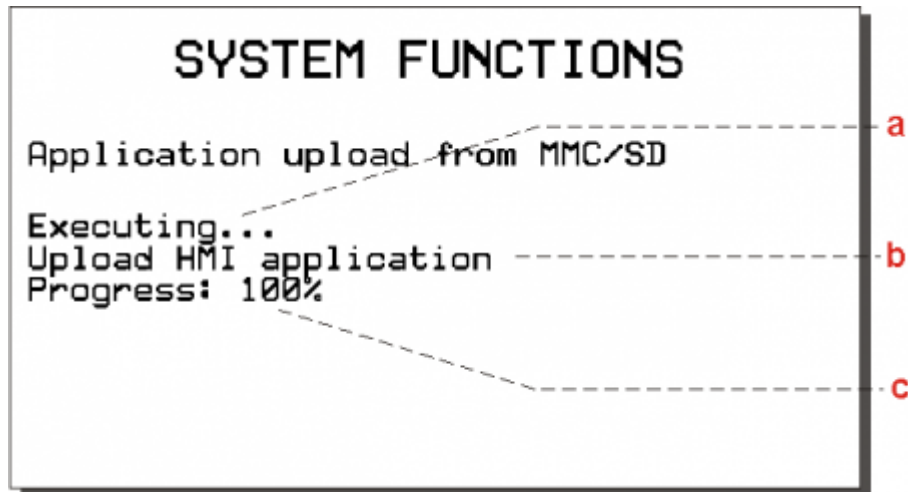
- **a** = indicates that the system is running.
- **b** = operation running.
- **c** = percentage of function executed.

SYSTEM FUNCTIONS

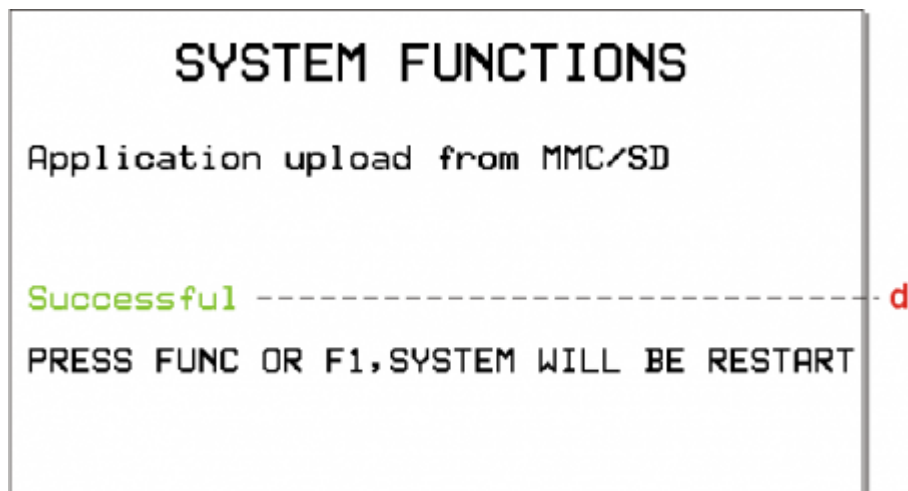Application upload from MMC/SD

Successful ------------------------ d

PRESS FUNC OR F1,SYSTEM WILL BE RESTART

- **d** = indicates that the function was successful.

Press the **FUNC key/F1 key** the instrument restars.	F1 **FUNC**
f the function is not successful **POW** led turns OFF and start the **ERR** led.	POW **ERR**

SYSTEM FUNCTIONS

Application upload from MMC/SD ---------- e

Upload retentive data
Configuration - Symbols error ---------- f

PLEASE TURN OFF AND TURN ON THE SYSTEM
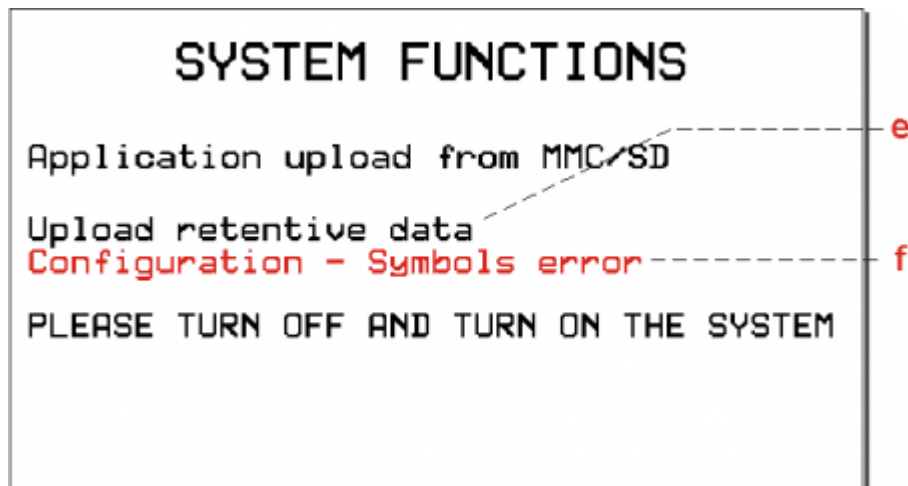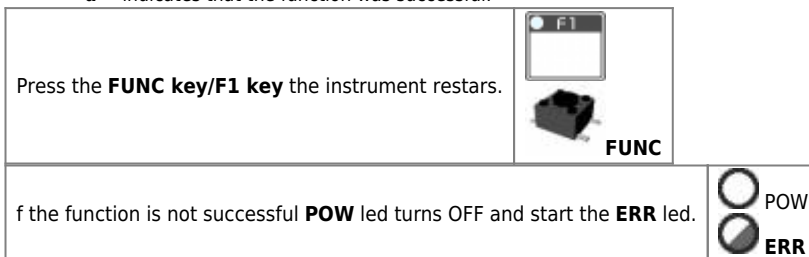
- **e** = operation that caused the error.
- **f** = indicates the type of error occurred.

The number of flashes indicates the type of error occurred as shown in table Error messages of system functions.

7.3.3.3 Touch Calib. function

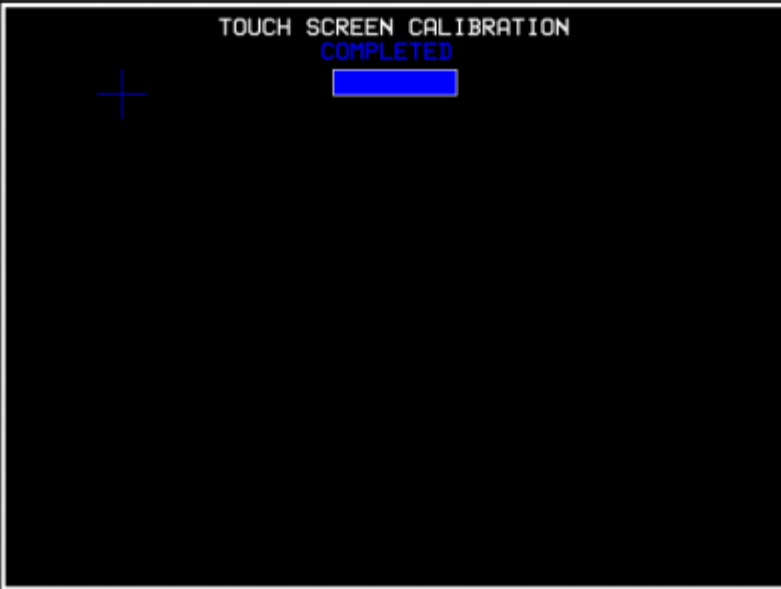This procedure, only available on instruments with touch-screen. Need to calibrate the pointing device.

TOUCH SCREEN CALIBRATION PRESS CROSS CENTER	At the entrance of the procedure, is presented with a screen that has a blue cross. Press the center of the cross until the progress bar has reached completion.
TOUCH SCREEN CALIBRATION COMPLETED	Appears the **"COMPLETED"** message and and you can release the pressure. *Note: If the pressure is released before completion of the progress bar, the procedure is aborted and the "!! OPERATION ABORTED !!"* message
TOUCH SCREEN CALIBRATION PRESS CROSS CENTER	Thereupon a new Green Cross. Even in this case, repeat until the progress bar is complete and is displayed **"COMPLETED"** message.

It then proposed a final page with a new cyan colored cross. Even in this case, repeat until the progress bar is complete and is displayed **"COMPLETED"** message.

7.3.3.4 Error messages of system functions

When a system function ends with an error displays a message that describes the cause of the error.

Error/Flashing number ERR led	Message
1	Generic error
2	Open/Exist/Create file error
3	Read file error
4	Write file error
5	Out of Memory error
6	QMos Version error
7	Checksum Error
8	Symbols checksum No Match
9	Configuration / Symbols error
10	File format error
11	Format error
12	Device not present or unformatted
13	Application not present error
14	Touch operation failure
15	File compression type not support
16	Target don't match project !
17	Fw version don't match project !
18	File copy error
19	Function not enabled

7.4 Information for programming

In this section are collected all the product information you need while you are programming, or during development of an application QCL.

7.4.1 Development softwares

For programming the product you should use the Qview-5 for QCL and Qpaint-5 for the design of graphics pages. Both of these software are contained in a software package called Qworkbench and it is freely downloadable from the site Qem (in the download section).

For programming with the development software QPaint-5 it is important select the correctly the target. Select *Project → Target Configuration* ans select the correctly model.

This paragraph looks at how to measure an estimate of use of the product's memories. The **nonvolatile memory** is available to memorise the **QCL** program and has a capacity of 512KB.
The memory space occupied is equal to the size of the .BIN file generated by Qview. The percentage memory occupied can be viewed in the CPU panel of Qview under "Used CODE memory", or this information can be obtained from the value of parameter "sizeapp" of the QMOS device.

The nonvolatile memory available to memorise the **HMI** program has a capacity of 5.5MB.
The memory space occupied is equal to the size of the .BIN file generated by Qpaint, whose value (in bytes) is viewed in parameter "memqtp" of the MMIQ2 device.

The **nonvolatile data memory** used to memorise **retentive variables**, has a capacity of 819KB.
The percentage memory occupied can be viewed in the CPU panel of Qview, under "Used RETENTIVE", or this information can be obtained from the value of parameter "sizeret" of the QMOS device.

The **volatile data memory** used to memorise **non ritentive variables** has a capacity that depends on various factors (e.g. the HMI and QCL program sizes, the HMI screen being viewed, etc)
The general memory of the free system, available as volatile data memory, is indicated by parameter "memfree" in the MMIQ2 device.

8. Available accessories

- IQ009
- Connectors polarization Kit
- Front panel customization kit