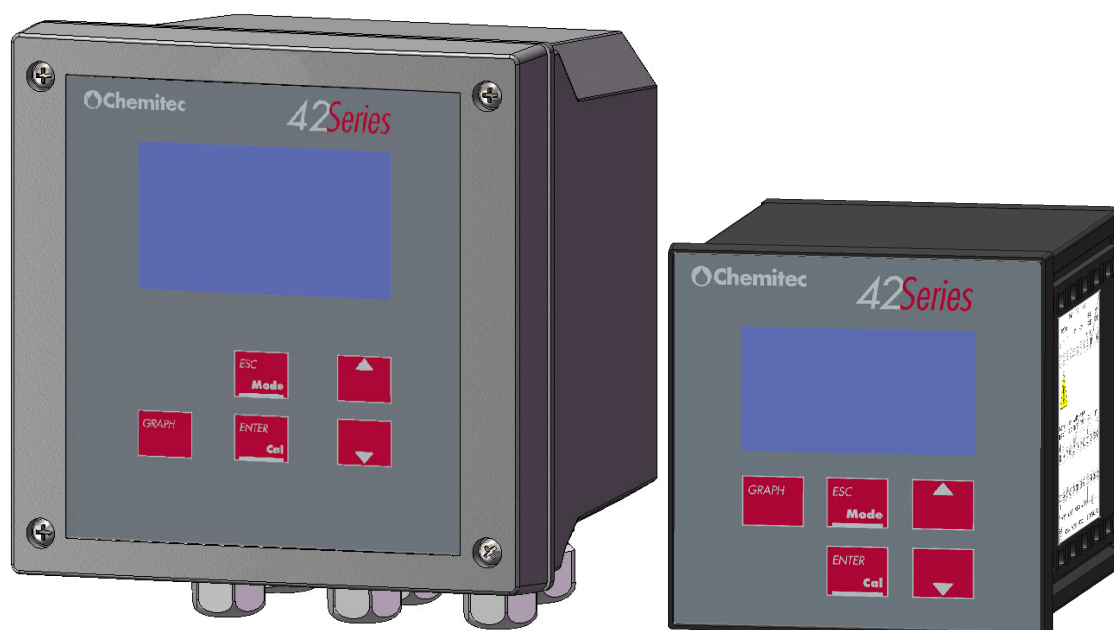




4222

CONDUCTIVITY AND TEMPERATURE ANALYZER



TECHNICAL MANUAL

P/N:
Rev. 1 Ver. 2.2

EDITION September 2012

GENERAL CLAUSES

Despite the fact that the utmost attention has been given taken in the preparation of this document, CHEMITEC s.r.l. cannot guarantee the accuracy of all information contained and cannot be held responsible for any consequent mistakes or damages that may arise from its use or application. The products, materials, software and services presented in this document are subject to development and with regards to presentation and performance characteristics, CHEMITEC s.r.l. reserves the right to carry out any modifications without prior notice.

COPYRIGHT

The reproduction or copy of this manual, even partial, and using any procedure is strictly prohibited.

AUTHORISED TECHNICAL SUPPORT CENTRES**CHEMITEC s.r.l.**

Via Isaac Newton, 28 – 50018 Scandicci - FIRENZE



INDEX

1	GENERAL	1
1.1	INFORMATION ON THE MANUAL	1
1.1.1	CONVENTIONS	1
1.2	DECLARATION OF RESPONSIBILITY BY THE MANUFACTURER	2
1.3	LIMITS OF USE AND PRECAUTIONS FOR SAFETY	2
1.3.1	ELECTRICAL SAFETY	2
1.3.2	SAFETY OF THE OPERATIVE ENVIRONMENT	3
1.4	GRAPHIC SYMBOLS	4
1.5	CAUTION SYMBOL	4
1.6	PLATE DETAILS	5
1.7	INFORMATION ON RECYCLING AND USE OF MATERIALS	5
1.7.1	SPECIAL ATTENTION TO CRITICAL COMPONENTS	5
2	GENERAL DESCRIPTION	6
2.1	MEASURING PRINCIPLES	6
2.2	MAIN CHARACTERISTICS	7
2.2.1	TECHNICAL CHARACTERISTICS FOR CONDUCTIVITY (PRIMARY MEASURE)	8
2.2.2	TECHNICAL CHARACTERISTICS FOR MEASURING OF SECONDARY TEMPERATURE	8
2.2.3	OPERATING FEATURES	8
2.3	CONTROLS, INDICATORS AND CONNECTIONS	10
2.4	GRAPHIC DISPLAY	11
2.4.1	LIST OF PRIMARY MENUS	11
2.4.2	DIVISION OF THE GRAPHICAL DISPLAY INTO AREAS IN THE RUN METHOD	12
3	INSTALLATION	15
3.1	COMPOSITION OF THE SUPPLY	15
3.1.1	INSTALLATION OF WALL MOUNTED DEVICE	15
3.1.2	INSTALLATION OF 96x96 ELECTRICAL PANEL DEVICE	16
3.1.3	INSTALLATION OF 144x144 ELECTRICAL PANEL DEVICE	17
3.1.4	CONNECTIONS TO THE POWER SUPPLY	17
3.1.4.1	Electrical Connections to the dosage systems (Users)	18
3.1.4.1.1	Connection terminal box for wall mounted 4222	19
3.1.4.1.2	Connection terminal box for panel mounted 4222	20
3.1.4.2	Connections to the Power Supply	21
3.1.5	CONDUCTIVITY PROBE CONNECTION	21
4	METHODS OF USE	22
4.1	COMPOSITION OF THE MEASURING SYSTEM	22
4.1.1	MINIMUM CONFIGURATION	22
4.1.2	MAXIMUM CONFIGURATION	22
4.2	START UP OF THE SYSTEM	23
4.2.1	MENU FUNCTIONS AT START	23
4.2.1.1	Contrast adjustment	23
4.3	INTRODUCTION OF OPERATIVE PARAMETERS – THE USE OF KEYS	23
4.3.1	SETUP MENU (TEMPERATURE – SYSTEM SETUP)	24
4.3.2	SETUP MENU (DIGITAL INPUT – SELECT MEASURE)	26
4.3.3	SETUP MENU (SETUP MEASURE)	26
4.3.4	OUTPUTS MENU (RELAY OUTPUTS – SET POINT 1)	28
4.3.5	OUTPUTS MENU (RELAY OUTPUTS – SET POINT 2, ETC.)	31
4.3.6	OUTPUTS MENU (SET POINT TEMP.)	33
4.3.7	OUTPUTS MENU (CURRENT OUTPUT)	34
4.3.8	OUTPUTS MENU (SETUP PID)	35

4.3.9	CALIBRATIONS MENU.....	36
4.3.9.1	Conductivity calibration	37
4.3.9.2	Temperature calibration	38
4.3.10	ARCHIVE MENU	39
4.3.11	MEASURING GRAPHICS MENU	40
4.3.12	MANUAL CONTROL MENU	41
4.3.13	FUNCTIONS IN RUN.....	42
5	USER MAINTENANCE.....	44
5.1	SPECIAL CAUTIONS FOR CRITICAL COMPONENTS.....	44
6	MODBUS PROTOCOL.....	45
7	WARRANTY	52
8	REQUEST FOR ASSISTANCE.....	53
8.1	PROCEDURE OF REQUEST FOR TECHNICAL ASSISTANCE	53
8.2	MAIN CHEMITEC OFFICES	53

1 GENERAL

1.1 INFORMATION ON THE MANUAL

This document contains reserved information. It may be subject to modifications and updates without any prior notice.

Printing chronology:

First edition: **4222 – Ver. 0 Rev. 1.0**

This manual is an integral part of the instrument. Upon initial installation of the equipment, the operator must carry out a careful control of the contents of the manual in order to check its integrity and completeness.

If for any reason it is ruined, incomplete or inadequate please contact CHEMITEC in order to reintegrate or replace the non-compliant manual immediately.

The official versions of the machine, for which CHEMITEC is directly responsible, are the ones in Italian and in English.

For countries of different languages from the ones indicated above, the official manual will remain the one in Italian. CHEMITEC will not be held responsible for any possible translations in different languages made by distributors or users themselves.

Compliance with the operative procedures and the precautions described in this manual is an essential requirement for the correct operation of the instrument and to guarantee total operator safety.

The manual must be ready in all parts, in front of the instrument, before use so that all methods of operation are clear as well as the controls, connections to the peripheral equipment and precautions for a correct and safe use.

The user manual must be stored, integral and legible in all parts, in a safe place and at the same time it must be immediately accessible to the operator during installation, use and/or installation revision operations.

1.1.1 CONVENTIONS

The present user manual uses the following conventions:

NOTE



The notes contain important information to be highlighted compared with the rest of the text. They generally contain information that is useful to the operator to carry out and optimise operative procedures of the equipment in a correct manner.

CAUTION



Caution messages appear in the manual before procedures or operations that must be observed in order to avoid any possible losses of data or damages to the equipment.

CAUTION



Caution messages appear in the manual in correspondence to the description of procedures or operations that, if carried out incorrectly, may cause damages to the operator or users.

1.2 DECLARATION OF RESPONSIBILITY BY THE MANUFACTURER

CHEMITEC will be held responsible for the safety, reliability and performance of the equipment only if used in compliance with the following conditions:

- Calibration, modifications or repairs must be carried out by qualified personnel, specifically authorised by CHEMITEC.
- Opening of the equipment and access to its internal parts may only be carried out by personnel qualified for maintenance and specifically authorised by CHEMITEC.
- The environment in which the equipment is used must comply with safety regulations.
- The electrical connections of the environment must be carried out according to regulations and must be perfectly efficient.
- Replacements that can be carried out on parts of the equipment and accessories must be done so with others of the same kind and of the same characteristics.
- The use and maintenance of the equipment and of relative accessories must be carried out in compliance with the instructions indicated in this manual.
- This manual must always be kept integral and legible in all parts.

1.3 LIMITS OF USE AND PRECAUTIONS FOR SAFETY

In order to guarantee safety of the operator together with the correct functioning of the equipment, it is important to work within the limits permitted and to adopt all of the precautions listed below:

CAUTION



Check before use to make sure that all safety requirements are fully satisfied. The equipment must not be powered or connected to other equipment until safety conditions are satisfied.

1.3.1 ELECTRICAL SAFETY

CAUTION



**All of the connections on the are isolated from the environment ground (mass is not isolated).
DO NOT connect any of these connections to earth.**

In order to guarantee conditions of utmost safety for the operator, we recommend that all of the indications listed in this manual are respected.

- **Power the equipment exclusively using network tension according to specifications (100 ÷ 240 Vac/dc 50-60 Hz)**
- **Replace damaged parts immediately.** Cables, connectors, accessories or other parts of the equipment that may be damaged or not working correctly must be replaced immediately. In this case contact your nearest authorised technical assistance centre.
- **Only use accessories and peripherals specified by CHEMITEC.** In order to guarantee all of the safety requirements, it is important to make exclusive use of the accessories specified in this manual which have been tested in combination with the equipment. The use of accessories and consumption materials of other manufacturers or not specifically recommended by CHEMITEC will not guarantee the safety and correct operation of the equipment. Only use peripherals that comply with the regulations of their specific categories.

1.3.2 SAFETY OF THE OPERATIVE ENVIRONMENT

- **The panel of the 4222 device is protected against the introduction of liquids.** Avoid subject the equipment to the risk of dripping water, sprays of water or immersion in water and the use in environments in which such risks may be present. Equipment in which liquids may have accidentally penetrated must be immediately switched off, cleaned and controlled by authorised and qualified personnel.
- Once programming has been carried out, we recommend that the transparent panel is closed.
- **Protection.**
 - 4222 **Wall** mounting
 - IP66 EN60529
 - EMI /RFI CEI EN55011 - 05/99
 - 4222 **96x96 Panel** mounting
 - IP20 EN60529
 - EMI /RFI CEI EN55011 - 05/99
 - 4222 **144x144 Panel** mounting
 - IP10 EN60529
 - EMI /RFI CEI EN55011 - 05/99
- **Use the equipment within the environmental limits of temperature, humidity and pressure specified.** The instrument has been developed to operate in the following environmental conditions:
 - Temperature of the working environment $0^{\circ}\text{C} \div +50^{\circ}\text{C}$
 - Temperature of storage and transportation $-25^{\circ}\text{C} \div +65^{\circ}\text{C}$
 - Relative humidity $10\% \div 95\%\text{RH}$ – not condensing

CAUTION



The water treatment plant in which the instrument is introduced must be developed in accordance with the functional requirements imposed by current legislation.

The apparatus must be inserted perfectly into the plant.

The plant must be kept operative in full compliance with the safety regulations provided.

The parameters indicated on the analyser must comply with current regulations.

Any signals of faults to the device must be positioned in an environment that is constantly controlled by operative personnel or plant assistants.

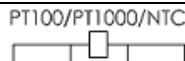
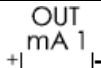
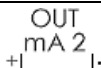
Non compliance with even just one of these conditions may lead the “logics” of the device to operate in a potentially dangerous manner for users of the service.

Therefore, we recommend that service personnel and/or maintenance personnel operate with the utmost care, pointing out any changes to the safety parameters immediately, in order to avoid the creation of any potentially dangerous situations.

As the considerations indicated above cannot be controlled by the product in question, the manufacturer will not be held responsible for any damages that these malfunctions may cause to people or things.

1.4 GRAPHIC SYMBOLS

The following table illustrates the drawings, the relative description and the position of all graphic symbols present on the equipment panels and on any other equipment or external devices to which they may be connected.

SYMBOL	DESCRIPTION	POSITION
	Danger symbol	A symbol located close to the clamps for connection to power.
  	Phase Neutral Earth protection	Symbols located close to the connections of the equipment to the electricity network
	Caution! Refer to the documentation attached	A symbol located close to the points in which the user manual should be consulted for important information. (see paragraph CAUTION).
	Positive	POSITIVE pole of the connector RS485 (A+)
	Negative	NEGATIVE pole of the connector RS485 (B-)
 CELL	CONDUCTIVITY	Conductivity sensor connection
 PT100/PT1000/NTC	PT100/1000	Temperature sensor connection
	Analogical output n.1	0/4 ÷20mA separated galvanically
	Analogical output n. 2	0/4 ÷20mA separated galvanically
	Symbol of separate collection of electrical and electronic equipment .	Symbol placed on the top of the electronic box

1.5 CAUTION SYMBOL

The symbol illustrated below represents the **CAUTION** symbol and reminds the operator that he should read the user manual for important information, advice and suggestions for the correct and safe use of the equipment.

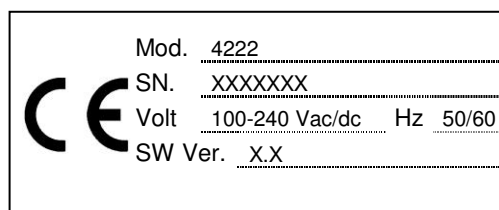


In particular, when it is positioned close to connection points to cables and peripherals, the symbol in question refers to careful reading of the user manual for instructions related to the nature of such cables and peripherals and the methods for correct and safe connections.

For the position of the CAUTION symbols on the equipment, refer to Chapter 2 “*Commands and Indicators, Connections*” and Chapter 3 “*Installation*” of this user manual. The reproductions of

equipment panels, with relative commands, connections, symbols and labels are provided in this chapter. Each caution symbol is accompanied by a detailed explanation of its meaning.

1.6 PLATE DETAILS



1.7 INFORMATION ON RECYCLING AND USE OF MATERIALS

CHEMITEC, in accordance with specific European regulations, aims at constant improvement of development and of production procedures of its equipment with the objective of drastically reducing the negative impact on the environment caused by parts, components, consumption materials, packaging and the equipment itself at the end of its life cycle.

Packaging is conceived and produced to allow for its re-use or recovery, including recycling of the majority of the materials and to reduce the amount of waste or residues to be disposed of, to a very minimum. In order to assure a correct environmental impact the equipment has been designed with the smallest circuit possible, with the lowest differentiation possible of materials and components, with a selection of substances that guarantee utmost recycling and maximum reuse of the parts and waste disposal free from ecological risks.

The equipment is made in such a way as to guarantee the easy separation or dismantling of the materials containing contaminants compared with others, in particular during maintenance operations and the replacement of parts.

CAUTION



The disposal/recycling of packaging, of consumption materials and of the equipment itself at the end of its life cycle must be carried out in accordance with the norms and regulations that are currently valid in the country in which the equipment is used.

1.7.1 SPECIAL ATTENTION TO CRITICAL COMPONENTS

The instrument is fitted with an LCD liquid crystal display, which contains small amounts of toxic materials.

2 GENERAL DESCRIPTION

The analyser of this manual is made up of an electronic device plus a technical manual.

The device may be installed on an electrical board or to the wall at a maximum distance of 15 metres from the measuring Probe.

It is powered by the network (85÷265Vac/dc-50/60Hz) by a Switching feeder.

This equipment has been designed to analyse ON-LINE and pilot the dosage pumps for the treatment of water in different applications:

- Waste water treatment plant
- Treatment and Discharge of Industrial Water
- Fish farm
- Primary Water, Drinking Water

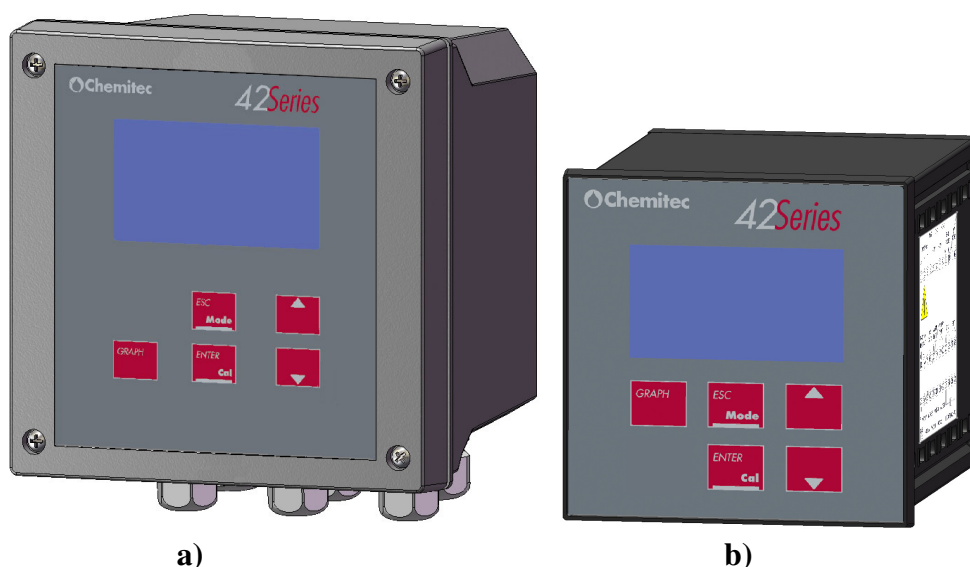


Figure 1 – Wall (a) and panel (b) mounting Conductivity analyzer (4222)

2.1 MEASURING PRINCIPLES

The electrical conductivity measure shows the ion concentration into a solution.

More is the solution acid or even basic salt quantity, higher is the conductivity. The conductivity measuring unit is Siemens/cm. The measuring scale for water solutions starts with the ultra-pure water whose conductivity is 0.05 $\mu\text{S/cm}$ (25°C). Conductivity of the natural water, e.g. of the drinking water, or of the surface waters is of about 100 ... 1000 $\mu\text{S/cm}$. Some bases, as the potassium hydroxide, with values being slightly higher than 1000 ms/cm, reach the scale upper value.

In particular, the conductivity measuring is used in water analysis (drinking water, mineral water, underground water, distilled water, demineralised water, boiler feed water, waste water), for galvanic baths controls, purity controls (organics, nutrients), in the thermoelectric units (steam-condensate cycle control), in the food industries, in sugar factories, cellars, textile industry, automatic irrigation plants, etc.

The electrical conductivity of a solution is defined as the reciprocal of the opposite resistance by a cubic centimetre of such a solution, at a certain temperature, i.e. of the resistance being measured between two 1 cm² surface electrodes, 1 cm. away, immersed in the above solution.

Taking the 20°C temperature as a reference, the conductivity changes as per the following formula

$$C_t = C_{20} [1 + \alpha/100 (T - 20)]$$

where:

C_t	= conductivity to the temperature T
C_{20}	= conductivity at 20°C
T	= solution temperature
α	= T coefficient at 20°C in % / °C

The α value is between 1.3 and 3.1%/°C for almost all of the electrodes and is usually 2%/°C in the diluted solutions. Aiming at comparing the various solutions conductivity values, it is necessary to bring all the measure back to the 20°C reference temperature using the above said formula (take note that if the conductivity meter does not include the temperature equalizer, the measure refers to the solution conductivity at the effective temperature; if the conductivity meter includes the equalizer, the conductivity shown refers to that of the solution when brought to the selected reference temperature, nevertheless the solution temperature at the measuring time). The conductivity measure can be taken using both the electronic instrument and a measuring cell. The cell includes two ore more electrodes. The base electrical feature of the conducimetric cells is the “cell factor” (K) depending exclusively on the geometric dimensions of the cell and expressed in cm (cm² of section divided by the “cell factor”. The conductivity value is given by:

$$C_s = C * K = C/F [2]$$

where:

C_s	= solution specific conductivity
C	= conductivity reading on the instrument
K	= cell constant, in cm ⁻¹
F	= cell factor, in cm

For measuring the low conductivity values it is recommended to use high factor cells and vice-versa. Another important distinction standard relates to the materials of the electrodes, i.e.:

- ➔ platinum-plated (Pt spongy surface)
- ➔ stainless steel (properly satin and oil free surface)
- ➔ graphite

The concentric (or self-shielded) cells are then distinguished from the symmetrical electrodes. The measure accuracy and stability might be highly reduced by the electrode polarization and contamination. The polarization effect is due to the electrostatic charges that generates on the electrode surfaces (even if the ion movement is due to an alternate electric field) and is particularly detected under concentrate solutions; on the contrary, the contaminations are due to deposits, encrustations, oil, grease, etc. The two phenomena can be (partially) reduced by using electrodes made of a material suitable to the solution and by using a proper frequency of the oscillator powering the cell.

2.2 MAIN CHARACTERISTICS

- Measuring of Conductivity
- Measuring of Temperature using the NTC/PT100/PT1000 probe
- Automatic Compensation of Temperature
- Programming key pad with 5 keys
- LCD Graphic display 128x64 with background illumination

- Internal Data Logger (flash 4 Mbit) with the possibility of graphic and table visualisation of measurement trends
- PID adjustment
- Serial outlet RS485 MOD BUS RTU
- Data download on USB key (optional)
- 2 Programmable Analogical Outlets
- 2 Relay Outlets for intervention thresholds
- 1 Relay Outlet for Instrument Anomaly Alarm or Temperature Set Point
- 1 Relay Outlet for Probe Washing or Temperature Set Point
- 1 Digital Entrance for disabling of doses

➤ ***Main hardware characteristics of the electronic device***

The hardware structure of this periphery is based on the adoption of extremely new CPU CMOS with 8 bits developed specifically for the execution of the so-called “embedded” applications.

The card uses an EEPROM to store the Set-up data and flash memories for storage of the archives of historical data and LOG files of events.

The Card has 1 RS485 gate (opto-isolated) for local networks used for connections with local communication devices (configuration computer, terminals and remote controls etc).

The card integrates a Real Time Clock (clock with date) that allows the software to storage figures in a chronological order.

➤ ***The device has been designed to be fitted onto a panel, and is built with an IP66 protection panel.***

2.2.1 TECHNICAL CHARACTERISTICS FOR CONDUCTIVITY (PRIMARY MEASURE)

Measurement range	00.00 ÷ 20.00 / 000.0 ÷ 200.0 / 0 ÷ 2000 µS – 00.00÷20.00mS (cell K1)
Resolution	± 0.01/± 0.1/± µS ± 0.01mS
Precision	± 1% F.S.
Max. load	500 Ohm
NAMUR alarm output	2.4 mA (with range 4/20mA)

2.2.2 TECHNICAL CHARACTERISTICS FOR MEASURING OF SECONDARY TEMPERATURE

Sensor	PT100/PT1000.
Measurement range	0 ÷ +50°C.
Resolution	± 0.1°C
Precision	± 1% F.S.

2.2.3 OPERATING FEATURES

Power supply	100 ÷ 240 Vac/dc 50-60 Hz (24 Vac/dc optional)
Power consumption	< 7W
Relay outputs:	
Set Point ON – OFF	00.00 ÷ 20.00 / 000.0 ÷ 200.0 /

0 ÷ 2000 μ S – 00.00÷20.00mS

ON – OFF Time

000 ÷ 999 Seconds

For every digital output a relay with contacts opened normally is used. The maximum current commutable is 1 Ampere, the maximum tension commutable is 230Vac, maximum power 230VA on a resistive load

Alarm:

Function

Delay, Faults and Min./Max.

Delay time

00:00 ÷ 99:99 min

Threshold disabling

Enable / Disable

Relay function

Closed / Open

Holding range

00.00 ÷ 20.00 / 000.0 ÷ 200.0 /
0 ÷ 2000 Δ μ S – 00.00÷20.00 Δ mS

Holding time

00:00÷ 99:99 min

For alarm end wash digital output, a relay with contacts opened normally is used. The maximum current commutable is 1 Ampere, the maximum tension commutable is 230Vac, maximum power 230VA on a resistive load

Digital input:

Input voltage

24 Vcc /ac

Absorption

10mA max

Analogic outputs:

Outputs

n.2 programmable outputs 0/4-20mA

Max. load

500 Ohm

NAMUR alarm output

2.4 mA (with range 4/20mA)

PID dosing function

P – PI – PID

Proportional band

0 – 500%

Integration

0:00 – 5:00 min

Derivative

0:00 – 5:00 min

2.3 CONTROLS, INDICATORS AND CONNECTIONS

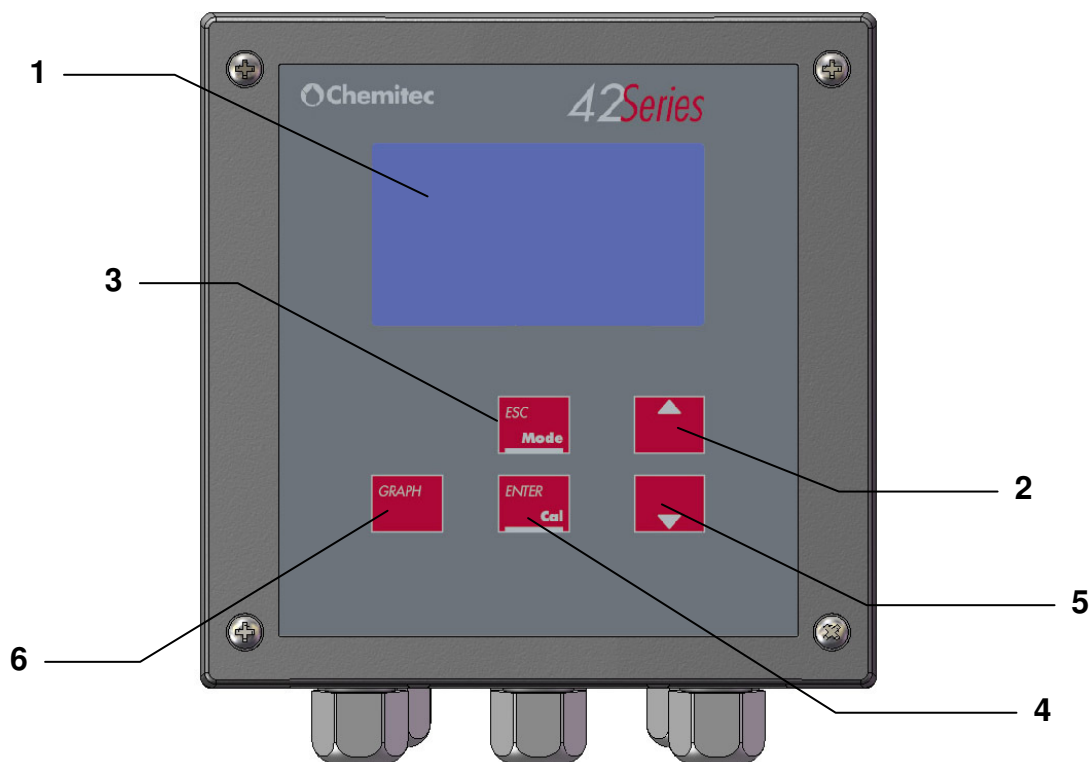


Figure 2 – Wall instrument, front panel

1. Visualizer with LCD Display
2. UP key
3. ESC key
4. ENTER key
5. DOWN key
6. GRAPH key

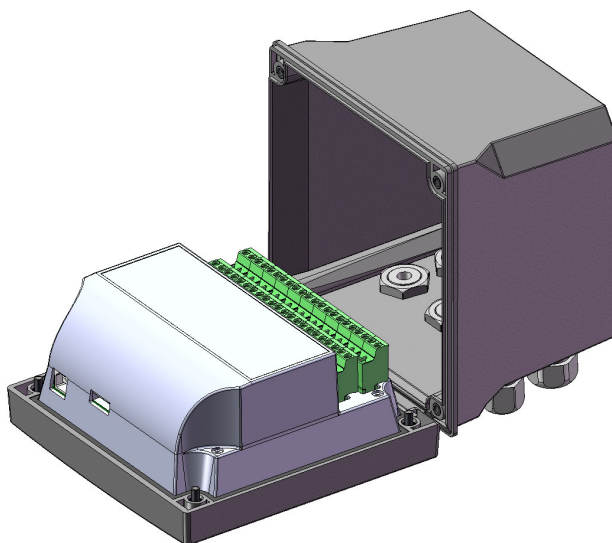


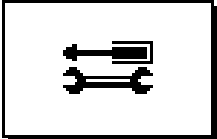
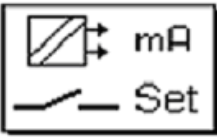
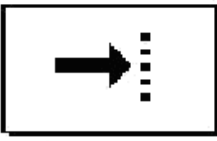
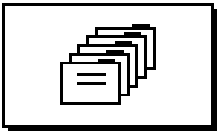
Figure 3 – Access to the terminal box

2.4 GRAPHIC DISPLAY

The graphic display allows for visualization of the various programming menus and, in the measuring method (RUN), visualization of the measurements and of the state of operation.

2.4.1 LIST OF PRIMARY MENUS

The following table illustrates the symbols visualized on the display which represent the various programming menus.

VISUALIZATION ON THE GRAPHIC DISPLAY		DESCRIPTION
1	 SETUP	SETTINGS MENU All basic parameters for operation logics are set
2	 OUTPUTS	OUTPUT MENU Setting of analogical and digital outputs
3	 CALIBRATIONS	CALIBRATIONS MENU Calibration Procedure of the electrode
4	 ARCHIVE	ARCHIVE MENU Setting of the data archive and visualization mode
5	 GRAPHIC MEASUR.	GRAPHICAL MEASUREMENT MENU Visualization of archives in a graphical form
6	 MANUAL CONTROL	MANUAL CONTROL MENU Manual control and activation of Inputs and Outputs

2.4.2 DIVISION OF THE GRAPHICAL DISPLAY INTO AREAS IN THE RUN METHOD

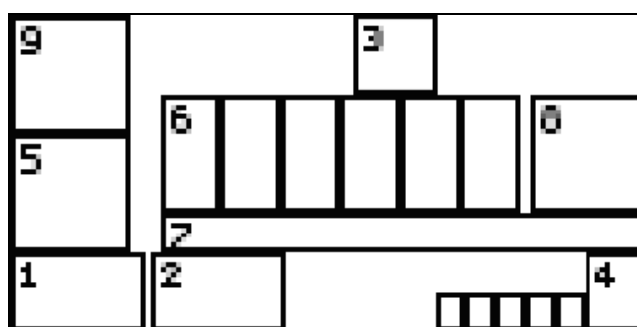
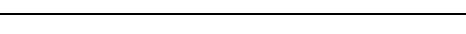


Figure 4 – Graphic display - divided up into areas

In the following table, for every area of the display indicated in figure 3, the symbols that may appear during functioning of the device in a measurement method (RUN) are represented and briefly described.

GRAPHIC ZONE	VISUAL REPRESENTATION	DESCRIPTION
1		Set1 - Open Relay
		Set1 - Closed Relay
		Set1 – Timed Active Threshold Relay Open
		Set1 – Timed Deactivated Threshold Relay Open
		Set1 - Timed Active Threshold Relay Closet
2		Set2 - Open Relay
		Set2 - Closed Relay
		Set2 - Timed Active Threshold Relay Open
		Set2 - Timed Deactivated Threshold Relay Open
		Set2 – Timed Active Threshold Relay Closed
1-2		Disabling Set Indicates digital entrance ON

GRAPHIC ZONE	VISUAL REPRESENTATION	DESCRIPTION
		Stay time Probe frozen on a value
		Maximum Logical Set Exceeded
		Minimum Logical Set Exceeded
		Maximum dosage time exceeded
3	 	Washing stage active
4		Value outlet n.1 (in mA)
		Value outlet n.2 of temperature (in mA)
		Value outlet n.2 auxiliary (in mA)
		Value outlet n.2 with PID function PID (in mA)
		Real temperature value (in Fahrenheit)
		Manual value of temperature (in Fahrenheit)
		Real temperature value (in Centigrades)
		Manual temperature value (in Centigrades)
5		Alarm active – Alarm relay closed
6	- + 0123456789*	Numerical
7		0% of the scale
		10% of the scale

GRAPHIC ZONE	VISUAL REPRESENTATION	DESCRIPTION
		20% of the scale
		30% of the scale
		40% of the scale
		50% of the scale
		60% of the scale
		70% of the scale
		80% of the scale
		90% of the scale
		100% of the scale
8	μS	Conductivity measurement unit
	mS	Conductivity measurement unit
	S	Conductivity measurement unit
	SEC	Seconds during stabilization
9		Archive full
		Storage of Data

3 INSTALLATION

Although the unit is suitable for installation in outdoor environments, it is recommended to avoid direct exposure to sun and weather. Before installing the **4222** carefully read the instructions provided below.

3.1 COMPOSITION OF THE SUPPLY

The supply consists of just one package which contains the following parts:

- 1 electrical control and command panel PN?????
- 1 Technical Manual PN?????

3.1.1 INSTALLATION OF WALL MOUNTED DEVICE

The wall must be completely smooth in order to allow for perfect adhesion of the device.

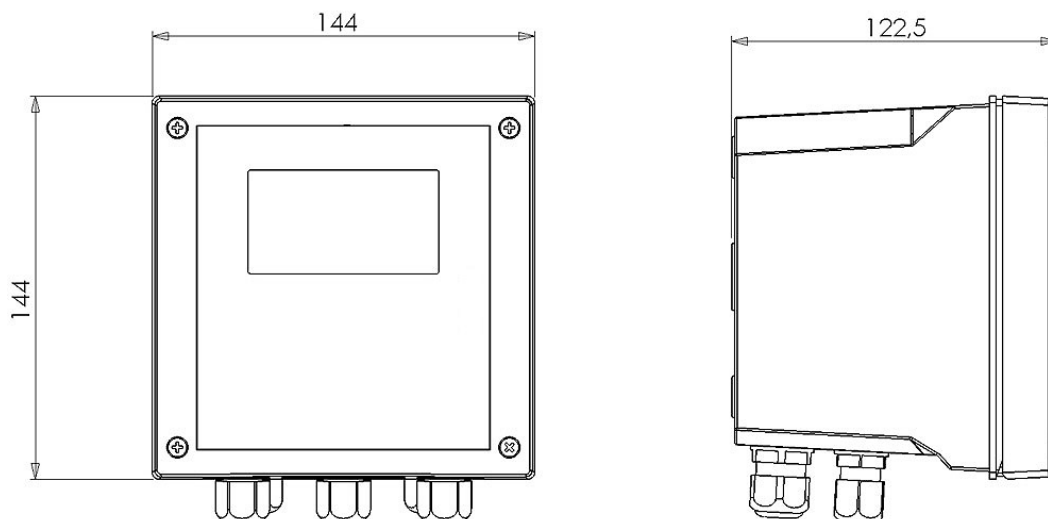


Figure 5 – Dimensions and encumbrance of the wall mounted device

Mechanical Dimensions	4222 Wall mounted
Dimensions (L x H x P)	144x144x122,5mm
Fixing depth	122,5mm
Material	ABS Grey RAL 7045
Mounting	Wall
Weight	1 Kg
Frontal Panel	Polycarbonate UV Resistant

Open the instrument, open the pre-shaped holes and fix the instrument itself to the wall. Use the provided plastic caps to close the holes.

The terminal box for connections is located on the bottom of the gear case and it is necessary to keep it separated from other equipment by at least 15 cm. in order to make it easier to use. Keep away from water drips and/or sprays of water from adjacent areas in order to safeguard the instrument during programming or calibration stages.

3.1.2 INSTALLATION OF 96X96 ELECTRICAL PANEL DEVICE

The wall must be perfectly smooth in order to allow for perfect adhesion of the electrical panel close to the device.

The net depth of the panel must be at least 130 mm.

The thickness of the panel must not exceed 5 mm.

The perforation DIMA must comply with the following layout:

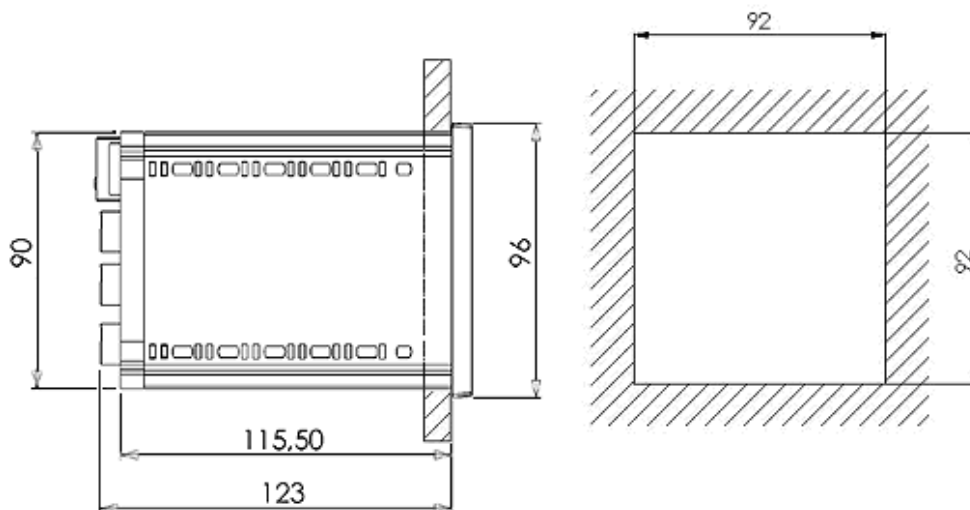


Figure 6 – Encumbrance and Dima for perforation of the panel

Mechanical Dimensions	4222 96x96 Panel Mounted
Dimensions (L x H x P)	96x96x115,5 mm
Fixing depth	130mm
Material	ABS Black
Mounting	Panel
Weight	0.7 Kg
Frontal Panel	Polycarbonate UV Resistant

Fixing of the gear case to the panel is carried out using two brackets (1) included in the standard supply, which are inserted into the housings (2) and fixed into position using the relative screws (3).

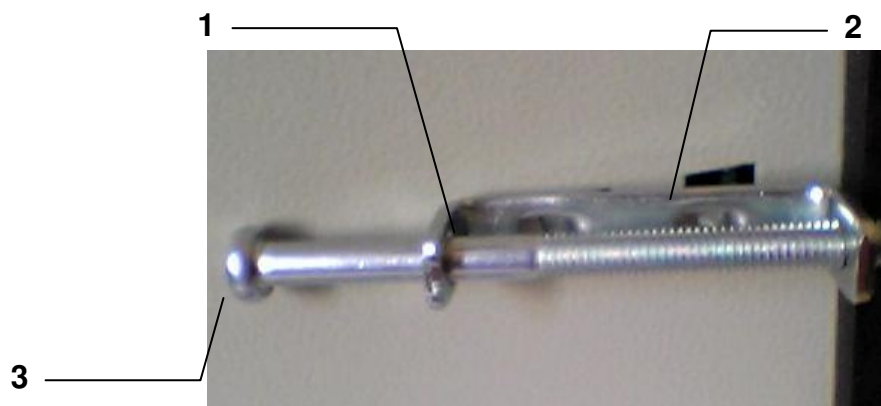


Figure 7 – Fixing bracket of the Device to the Panel

Keep free from dripping and/or sprays of water from adjacent areas.

3.1.3 INSTALLATION OF 144X144 ELECTRICAL PANEL DEVICE

The wall must be perfectly smooth in order to allow for perfect adhesion of the electrical panel close to the device.

The net depth of the panel must be at least 130 mm.

The thickness of the panel must not exceed 5 mm.

The perforation DIMA must comply with the following layout:

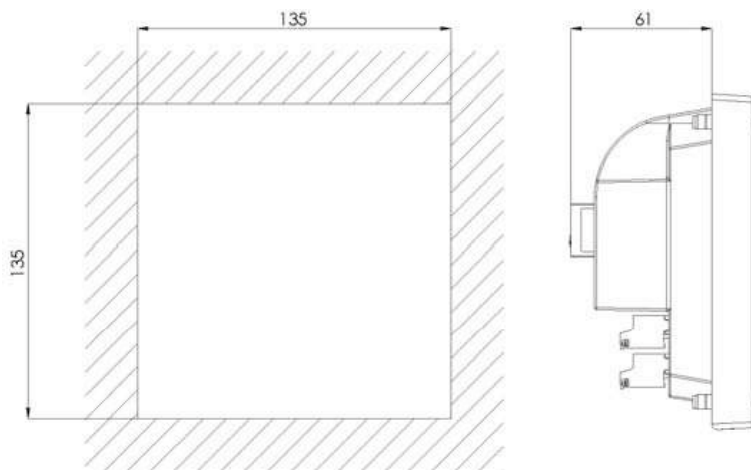


Figure 8 – Encumbrance and Dima for perforation of the panel

Mechanical Dimensions	4222 144x144 Panel Mounted
Dimensions (L x H x P)	144x144x86,5mm
Fixing depth	70mm
Material	ABS Grey RAL 7045
Mounting	Panel
Weight	0.7 Kg
Frontal Panel	Polycarbonate UV Resistant

The locking of the control unit to the panel is made through the mounting backplate, which is fixed to the panel on the inner side, using the apposite screws.

3.1.4 CONNECTIONS TO THE POWER SUPPLY

If possible avoid any cables destined for high power use to be positioned close to the device as they may cause faults of an inductive nature to the analogical section of the instrument.

Apply a tension alternating between 100Vac and 240Vac 50/60 Hz or, according to details on the identification plate, the most stabilised tension possible.

Avoid at all costs connections to power supplies that have been rebuilt, for example, with the help of transformers in which this rebuilt power supply will feed other systems beyond the device (perhaps of an inductive kind) because, in this way, high tension spikes will be created and once they are irradiated it becomes very difficult to block and/or eliminate them.

CAUTION



The electric line must be fitted with a suitable life-saving device and magneto-thermal, in compliance with correct installation norms.

In any case it is always best to check the quality of the Ground connection. It is very common to find Ground connections, mainly in industrial environments, that are generators themselves of disturbances: in the case of any doubts on quality a connection to a rod dedicated to the device plant is recommended.

3.1.4.1 Electrical Connections to the dosage systems (Users)

CAUTION



Before starting connections between the Device and the external Users, make sure that the electrical panel is switched off and the cables from the Users are not under tension.

“Users” mean the outlets and relays used in the device

- (SET1) for the Dosage Pump or control command
- (SET2) for the Dosage Pump or control command
- (ALARM) the alarm command transmitted by the instrument to the siren and/or flashing light
- (WASH) electrode washing command

CAUTION



Each relay contact can support, on a resistive load, a maximum current of 1 Ampere with a max. of 230V, therefore a total power of 230VA

In the case of higher levels of power it is best to carry out connections as indicated in the layout of fig. 9-b)

If the load to be handed is of low power or of a resistive nature, the layout indicated in Fig. 9-a) can be used.

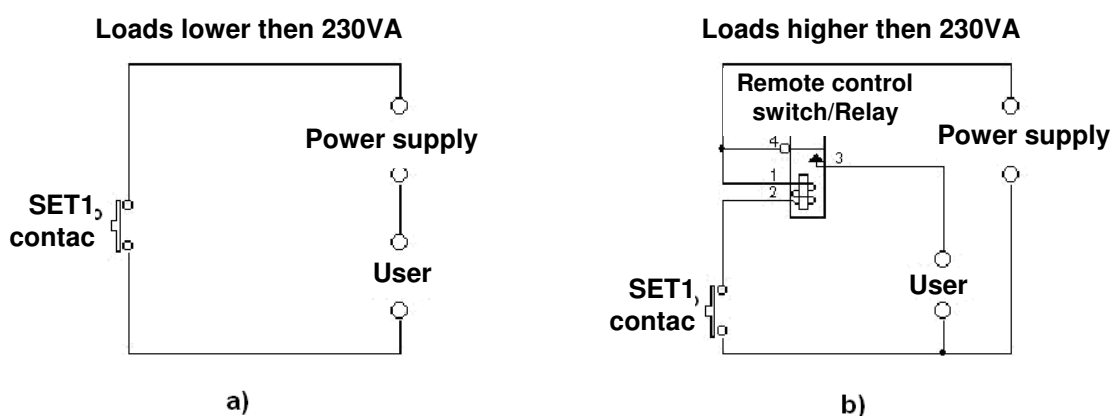


Figure 9 Examples of connection with users

NOTE



The layouts indicated above are typically indicative as details of all of the protection and safety devices necessary are missing.

3.1.4.1.1 Connection terminal box for wall mounted 4222

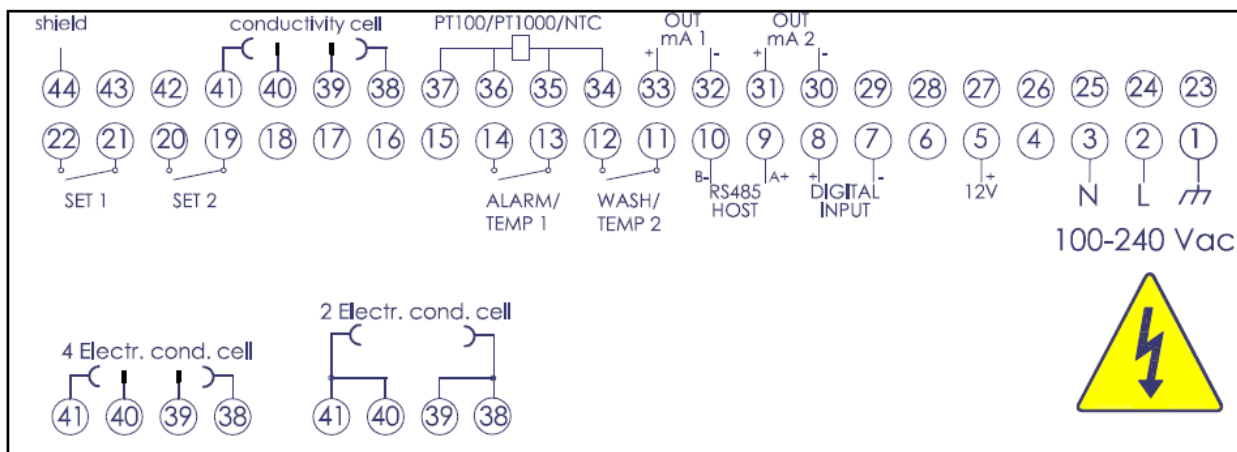


Figure 10 Connections terminal box (wall mounted)

CLAMP Nr.	GRAPHIC	DESCRIPTION
1		Power supply (Earth)
2	L	Power supply (Neutral)
3	N	Power supply (Phase)
5	12V ⁺	Probe Supply (+12V)
7		Digital input (-)
8		Digital input (+)
9		RS485 (A+)
10		RS485 (B-)
11		Relay for Wash and Temp (N.C. contact)
12		Relay for Wash and Temp (N.O. contact)
13		Relay for Alarm and Temp (N.C. contact)
14		Relay for Alarm and Temp (N.O. contact)
19		Relay for Set Point 2 (N.C. contact)
20		Relay for Set Point 2 (N.O. contact)
21		Relay for Set Point 1 (N.C. contact)
22		Relay for Set Point 1 (N.O. contact)
30		Output mA2 (-)
31		Output mA2 (+)
32		Output mA1 (-)
33		Output mA1 (+)
34		NTC / PT100 / PT1000 Common Cable
35		NTC / PT100 / PT1000 Signal Cable
36		NTC / PT100 / PT1000 Signal Cable
37		NTC / PT100 / PT1000 Common Cable
38		Driving 1 (4 Wires)
39		Signal Return 1 (4 Wires)
40		Signal Return 2 (4 Wires)
41		Driving 2 (4 Wires)

In case of 2 wires conductivity probe connection:

38		Signal 1 (2 Wires)
39		Signal 1 (2 Wires)
40		Signal 2 (2 Wires)
41		Signal 2 (2 Wires)

3.1.4.1.2 Connection terminal box for panel mounted 4222

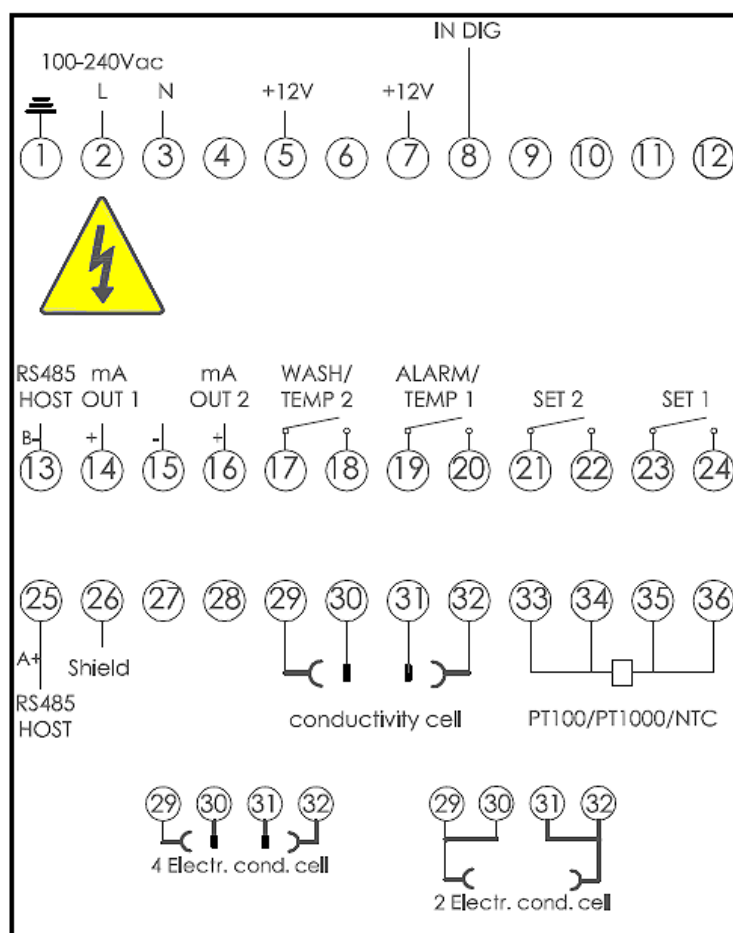
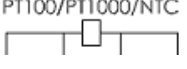


Figure 11 Connections terminal box (panel mounted)

CLAMP Nr.	GRAPHIC	DESCRIPTION
1		Power supply (Earth)
2	L	Power supply (Neutral)
3	N	Power supply (Phase)
5	12V⁺	Probe Supply (+12V)
7	 DIGITAL INPUT	Digital input (-)
8		Digital input (+)
13	 RS485 HOST	RS485 (B-)
25		RS485 (A+)
14	 mA OUT 1 mA OUT 2 + - +	Output mA1 (+)
15		Output mA1 – mA2 (-) (common)
16		Output mA2 (+)
17	 WASH/ TEMP 2	Relay for Wash and Temp (N.C. contact)
18		Relay for Wash and Temp (N.O. contact)
19	 ALARM/ TEMP 1	Relay for Alarm and Temp (N.C. contact)
20		Relay for Alarm and Temp (N.O. contact)
21	 SET 2	Relay for Set Point 2 (N.C. contact)
22		Relay for Set Point 2 (N.O. contact)
23	 SET 1	Relay for Set Point 1 (N.C. contact)
24		Relay for Set Point 1 (N.O. contact)
26	Shield	Shield

CLAMP Nr.	GRAPHIC	DESCRIPTION
29	 4 Electr. cond. cell	Driving 2 (4 wires)
30		Signal 2 Return (4 wires)
31		Signal 1 Return (4 wires)
32		Driving 1 (4 wires)
33	 PT100/PT1000/NTC	NTC / PT100 / PT1000 Common Cable
34		NTC / PT100 / PT1000 Signal Cable
35		NTC / PT100 / PT1000 Signal Cable
36		NTC / PT100 / PT1000 Common Cable

In case of 2 wires conductivity cell connection:

29	 2 Electr. cond. cell	Signal 2 (2 Wires)
30		Signal 2 (2 Wires)
31		Signal 1 (2 Wires)
32		Signal 1 (2 Wires)

3.1.4.2 Connections to the Power Supply

Once you have made sure that the tension complies with the one indicated in the previous paragraphs, connect the electrical power line to the clamps marked by connecting the clamp with the relative symbol to earth.

3.1.5 CONDUCTIVITY PROBE CONNECTION

Switch the instrument off.

Connect the electrode cables to the meter terminal box. Observe the number codes on the adhesive label placed under the electronics container cover or refer to the manual (see 3.1.3.1.1 e 3.1.3.1.2).

4 METHODS OF USE

4.1 COMPOSITION OF THE MEASURING SYSTEM

4.1.1 MINIMUM CONFIGURATION

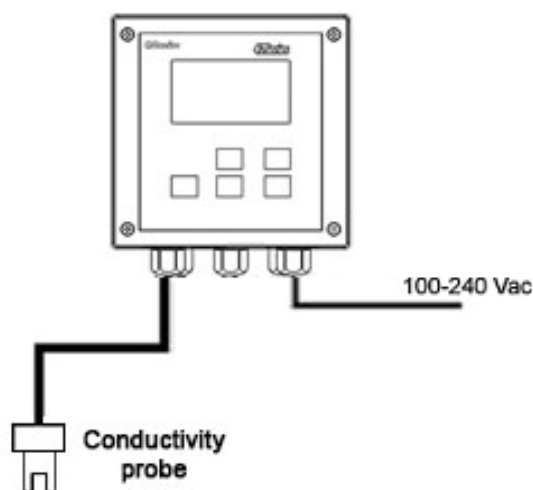


Figure 12 Minimum configuration

4.1.2 MAXIMUM CONFIGURATION

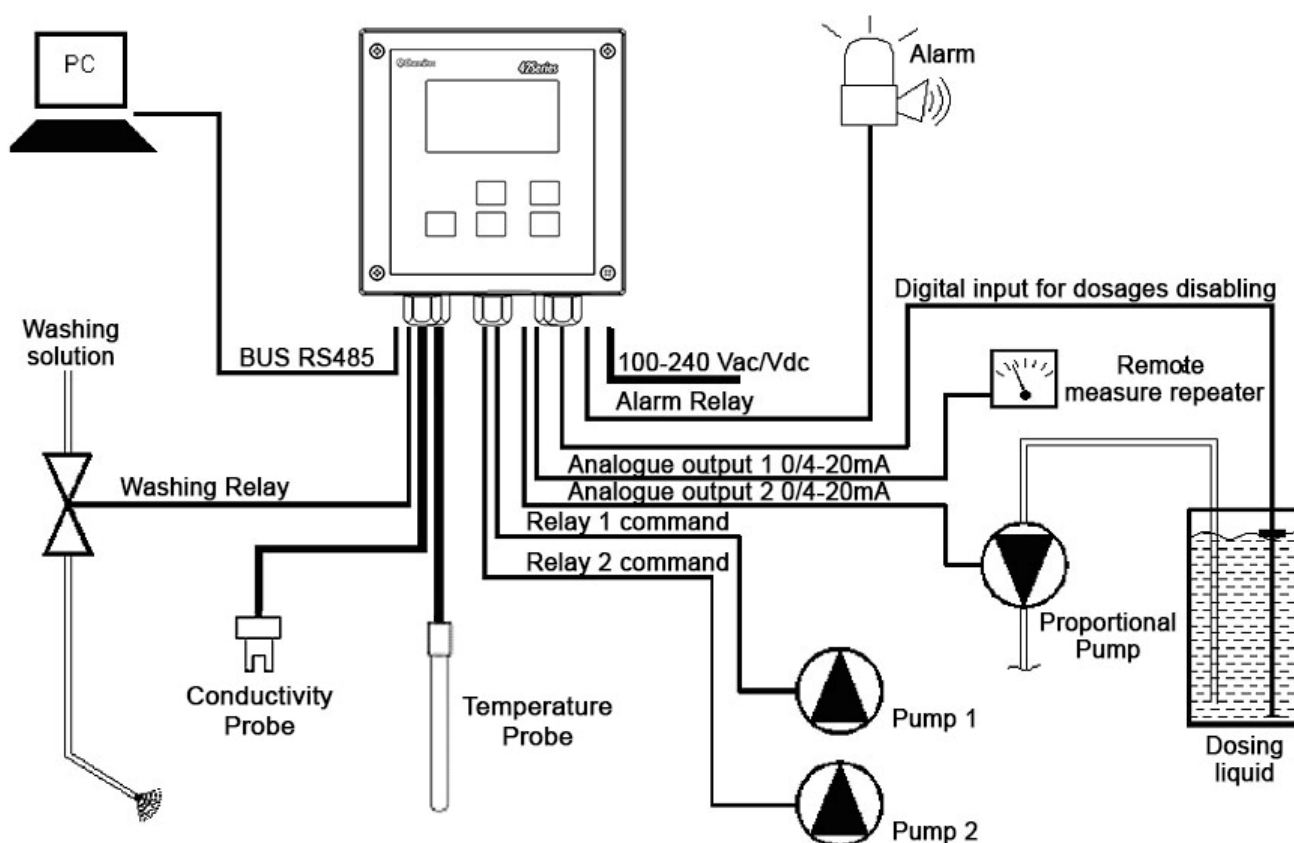


Figure 13 Maximum Configuration

4.2 START UP OF THE SYSTEM

Once the electronic device and the measuring probe (Conductivity) have been connected, programming of the software must be carried out in order to determine “personalisation” of parameters for correct use of the equipment.

Turn on the equipment by connecting it to the mains, the device does not have a power supply switch.

4.2.1 MENU FUNCTIONS AT START

When the equipment is turned on, it is possible to use some keys to intervene on programming functions not present in the SETUP.

(See paragraphs 4.3.1; 4.3.2; 4.3.3)

4.2.1.1 Contrast adjustment

Using the same procedure, but keeping the **DOWN** button pressed, the display contrast adjustment window will appear.

NOTE



During this operation release the **DOWN** button immediately after the first acoustic beep, otherwise the contrast will go quickly to 0% and the display will be completely white. In order to reset the correct level, simply press the **UP** key to the desired value.

Using the **UP** and **DOWN** keys it is possible to adjust the contrast percentage.

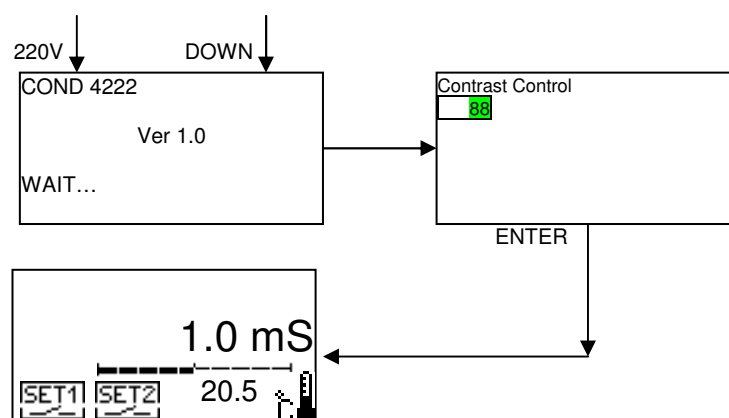


Figure 14 –Contrast Function Flow-Chart

Subsequently pressing **ENTER**, the RUN visualisation will be activated.

4.3 INTRODUCTION OF OPERATIVE PARAMETERS – THE USE OF KEYS

In order to introduce/modify operative figures and to carry out calibration procedures, use the menus visualised on the display through the 4 function keys located on the front panel of the device.

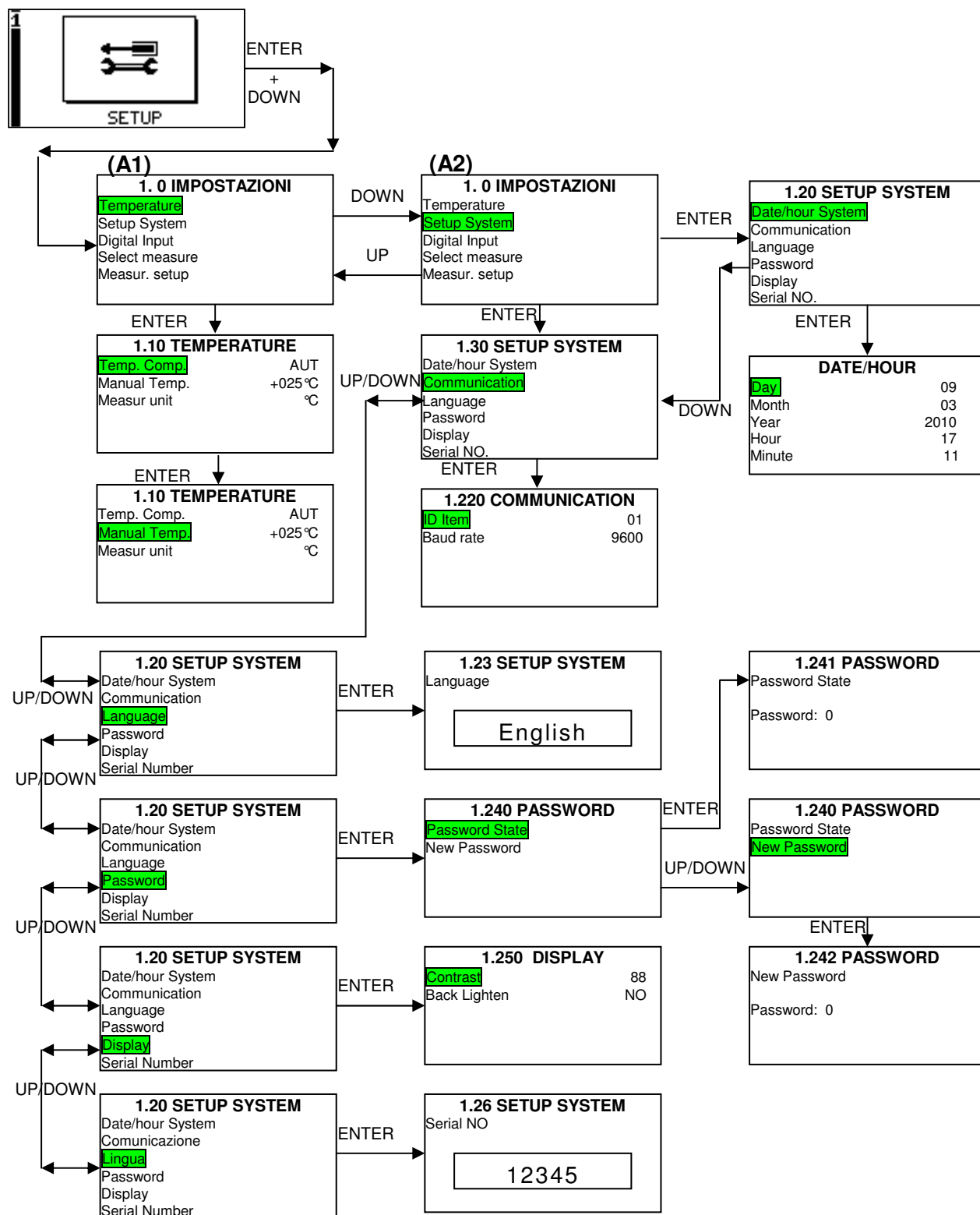
When turned on the apparatus will automatically position itself in a measuring method – the RUN function. By pressing the **ESC** key the programming method will be available through the first menu “1 SETTINGS”.

Using the **UP** and **DOWN** keys the various menus and submenus can be scrolled and information can be modified (increase/reduction).

Using the **ENTER** key access will be provided to the submenus for the input of information and the variations made will be confirmed.

By pressing the ESC key the screen will go back to the menu or to the previous function and any variations made will be cancelled.

4.3.1 SETUP MENU (TEMPERATURE – SYSTEM SETUP)



A1) Temperature

The Unit of Measurement function allows for the value of the temperature to be visualised in Centigrade or Fahrenheit. Centigrades are set as a default.

A2) Setup System

In this part of the programme which is divided up into 5 functions, the basic functioning parameters of the instrument are set.

Description of the functions:

DATE/HOUR SYSTEM

Setting of the DATE and TIME of the system that will be memorised every time that figures are viewed in a historical perspective.

COMMUNICATION

The instrument has a serial port in RS485 which is separated galvanically and can be used for dialogue with a HOST system using the standard protocol MOD BUS RTU. Through the serial port it is possible to visualise the real time status, programme all of the Set-Up and downloading all of the archives of the instrument.

The Communication Set-up function is used to programme the serial port and is divided up into two settings:

ID Instrument: A numerical address from 1 to 99 to which the instrument will reply. The default is 01.

Baud Rate: Speed of the RS485 serial which can be programmed at between 1200 and 38400. The default is 9600.

LANGUAGE

It is possible to select the language used by the Software between: Italian, English, French, Spanish and German.

PASSWORD

At this stage it is possible to activate and programme for access to the instrument. Once activated, each time that the programming stage is accessed the access password will be requested.

The password is made up of a 4 figure number. The default is 2002 which will always remain active even if a new password is programmed.

In order to access the step "Password Status" or "New Password", the existing password must be inserted and then the new input can be carried out.

DISPLAY

Contrast: It allows for the definition of a greater or lower contrast of the display according to the temperature in which the instrument is operating.

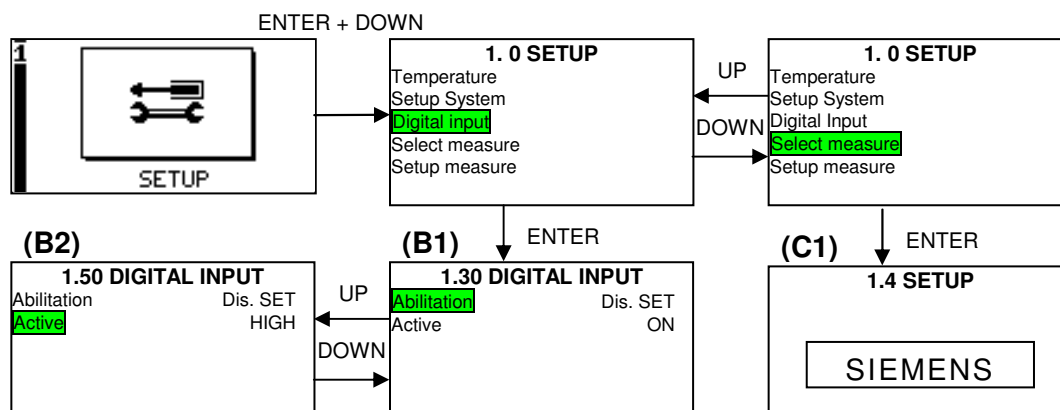
Background illumination: At this stage you can decide whether or not to maintain background illumination or to switch it off one minute after having released the key.

By programming YES the background illumination stays on, by programming ON it switches off automatically. NO is programmed as a default.

SERIAL NUMBER

In this part of the programme the serial number of the instrument is shown.

4.3.2 SETUP MENU (DIGITAL INPUT – SELECT MEASURE)



B1) Digital input: Abilitation

In this function it is possible to assign the digital input.

Setting “Dis. SET” the digital input is assigned to the SET POINT disabilitation.

Setting “WASH” the digital input is assigned to the WASH.

B2) Digital input: Active

This function allows to set the direction of the input: if active when the input goes HIGH or LOW.

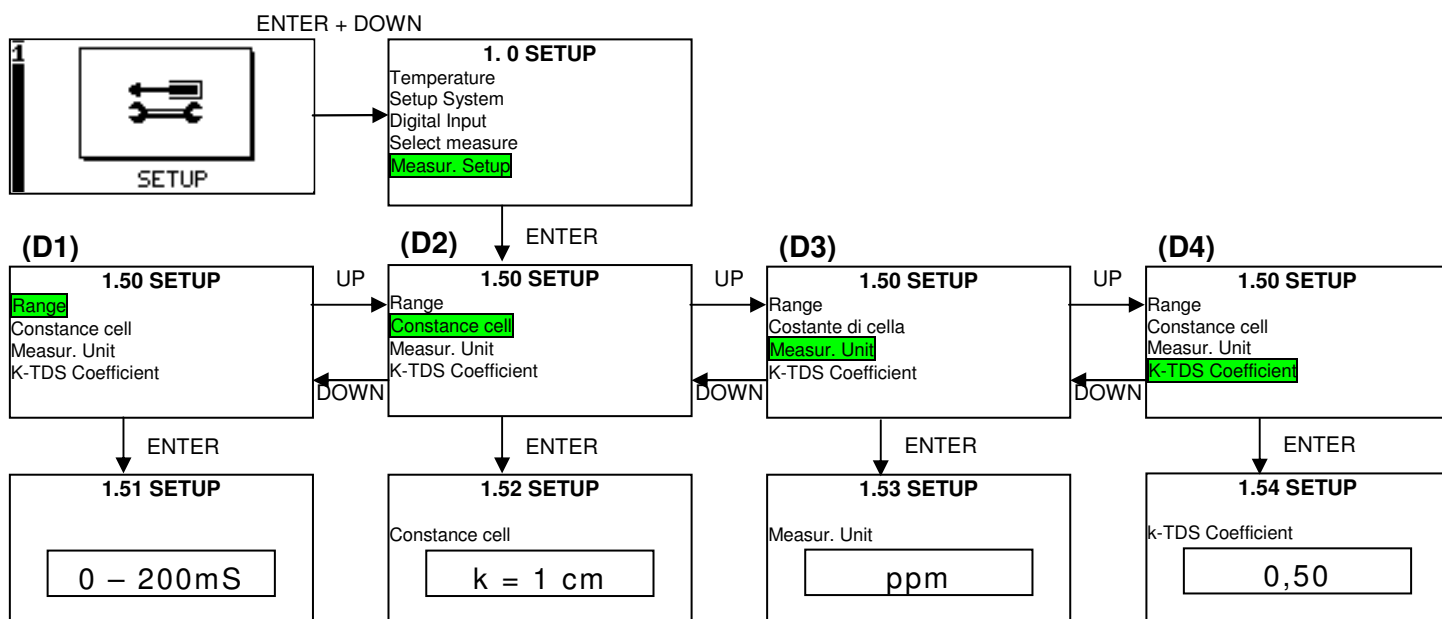
Setting “HIGH” the digital input is active when the input itself is powered.

Setting “LOW” the digital input is active when the input itself is not powered.

C1) Select measure

Allows to select the measuring unit , choosing from Siemens and TDS (Total Dissolved Salts).

4.3.3 SETUP MENU (SETUP MEASURE)



D1) Range

Allows to set the range in wich the probe works, acording to the assigned measuring unit and constance cell.

If the measuring unit is Siemens and the constance cell is 1, range is selectable between:

- **0-200 mS**
- **0-20 mS**
- **0-2000 μ S**
- **0-200 μ S**
- **0-20 μ S**

If the measuring unit is Siemens and the constance cell is 0,1, range is selectable between:

- **0-2 S**
- **0-200 mS**
- **0-20 mS**
- **0-2000 μ S**
- **0-200 μ S**

If the measuring unit is Siemens and the constance cell is 10, range is selectable between:

- **0-20 mS**
- **0-2000 μ S**
- **0-200 μ S**
- **0-20 μ S**
- **0-2 μ S**

If the measuring unit is Siemens and the constance cell is 10, range is selectable between:

- **0-20 μ S**
- **0-2 μ S**

If the measuring unit is TDS and the constance cell is 1, range is selectable between:

- **Ultra High**
- **High**
- **Medium**
- **Low**
- **Ultra Low**

If the measuring unit is TDS and the constance cell is 0,1, range is selectable between:

- **Ultra High**
- **High**
- **Medium**
- **Low**
- **Ultra Low**

If the measuring unit is TDS and the constance cell is 10, range is selectable between:

- **Ultra High**
- **High**
- **Medium**
- **Low**
- **Ultra Low**

If the measuring unit is TDS and the constance cell is 100, range is selectable between:

- **Low**
- **Ultra Low**

D2) Constance cell

Allows to set the value of the della Constance cell, choosing between 0.1, 1, 10 and 100.

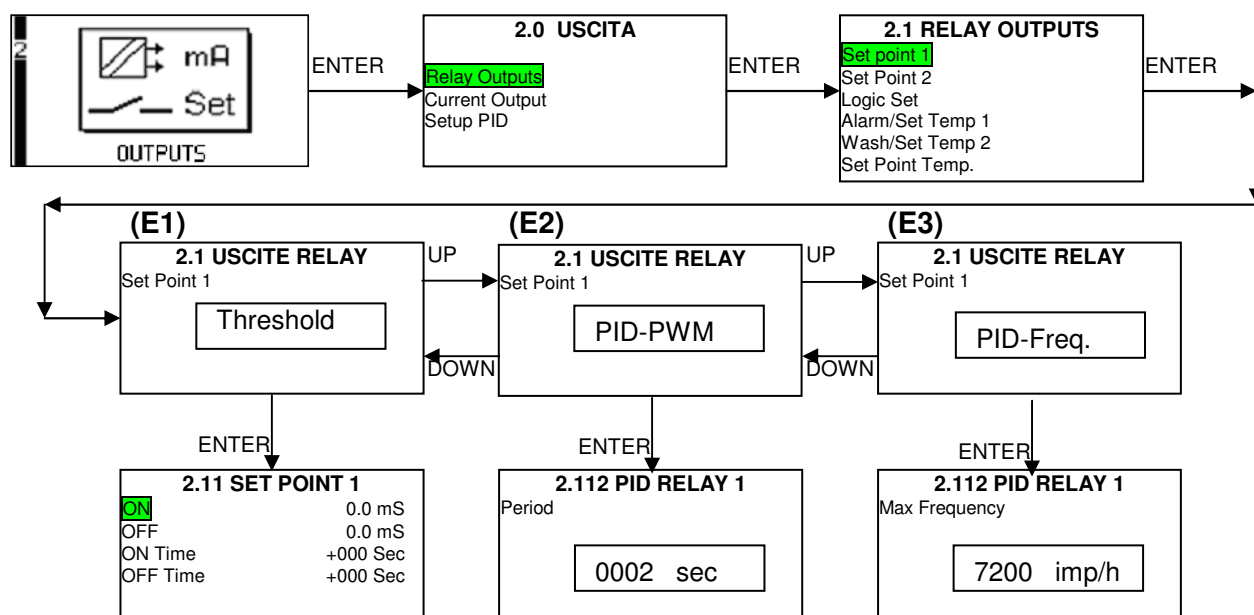
D3) Measur. Unit

This menu is only selectable if the invoice “TDS” in the “Select Measure” menu (C1) is selected and allows to set the measuring unit of the TDS; it’s possible to choose between ppm and mg/l.

D4) K-TDS Coefficient

This menu is only selectable if the invoice “TDS” in the “Select Measure” menu (C1) is selected and allows to set the multiplying coefficient of the conductivity value to find the corresponding TDS (Total Dissolved Salts) value.

4.3.4 OUTPUTS MENU (RELAY OUTPUTS – SET POINT 1)



The programming parameters of Set Point 1 establish the working logic of Relay 1. It is possible to programme using the logics of Relay 1 in the following ways:

E1) Threshold

By programming the Set Point for this function, we can activate the relay as a Threshold by programming an **ON** value (relay activation) and an **OFF** value (relay deactivation). The free programming of these two values will allow for the creation of a hysteresis suitable for any kind of application.

By programming the **ON** value higher than the **OFF** one (fig. 15.a) an **UPWARD** threshold will be achieved: (When the value exceeds the **ON** value, the relay is activated and remains active until the value falls below the **OFF** value).

By programming the **OFF** value higher than the **ON** one (fig. 15.b) a **DOWNWARD** threshold will be achieved: (When the value falls below the **ON** value, the relay is activated and remains active until the value exceeds the **OFF** value). See fig.15.

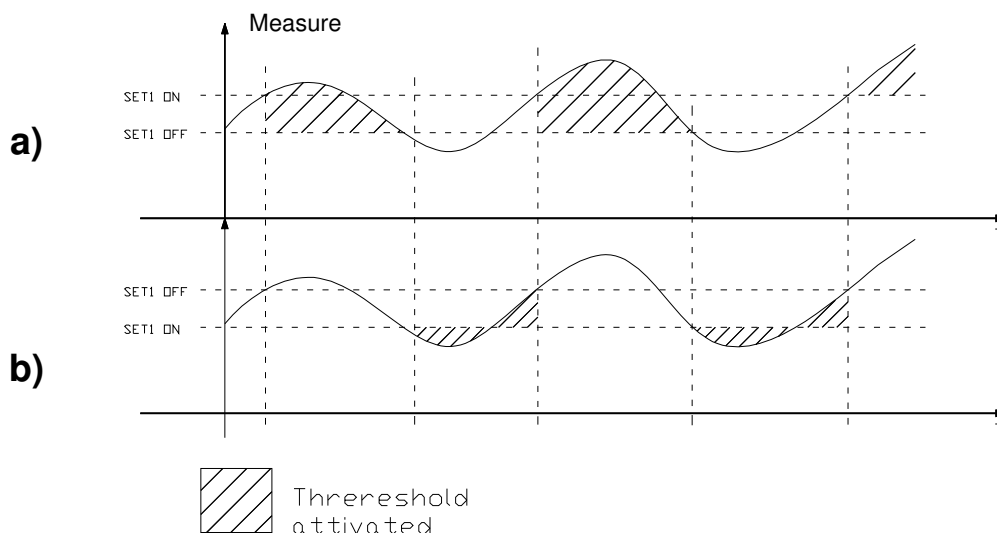


Figure 15 – Threshold operation

Furthermore by acting on the **Time ON** and **Time OFF** parameters it is possible to define a **DELAY** time or a **TIMED** operation of the Relay during its activation.

Negative of positive ON and OFF Times can be defined. (fig. 16)

By programming **Negative Times** the **DELAY** function is activated:

Eg. **Time ON: -5sec** , **Time OFF -10sec**. (fig. 16.a)

When the threshold is activated, the relay will close after 5 seconds (**ON time**) and it will remain closed for the entire period in which the threshold is active. When the threshold is deactivated the relay will remain closed for another 10 seconds (**OFF time**) after which time it will open.

By programming **Positive Times** the **TIME** function will be activated:

Eg. **Time ON: 5sec** , **Time OFF 10sec**. (fig. 16.b)

When the threshold is activated the relay will alternate between an open/closed position according to the times programmed. In the case of the example the relay will close for 5 seconds (**ON time**) after which time it will remain open for 10sec (**OFF time**). This cycle will continue until Threshold 1 is not deactivated.

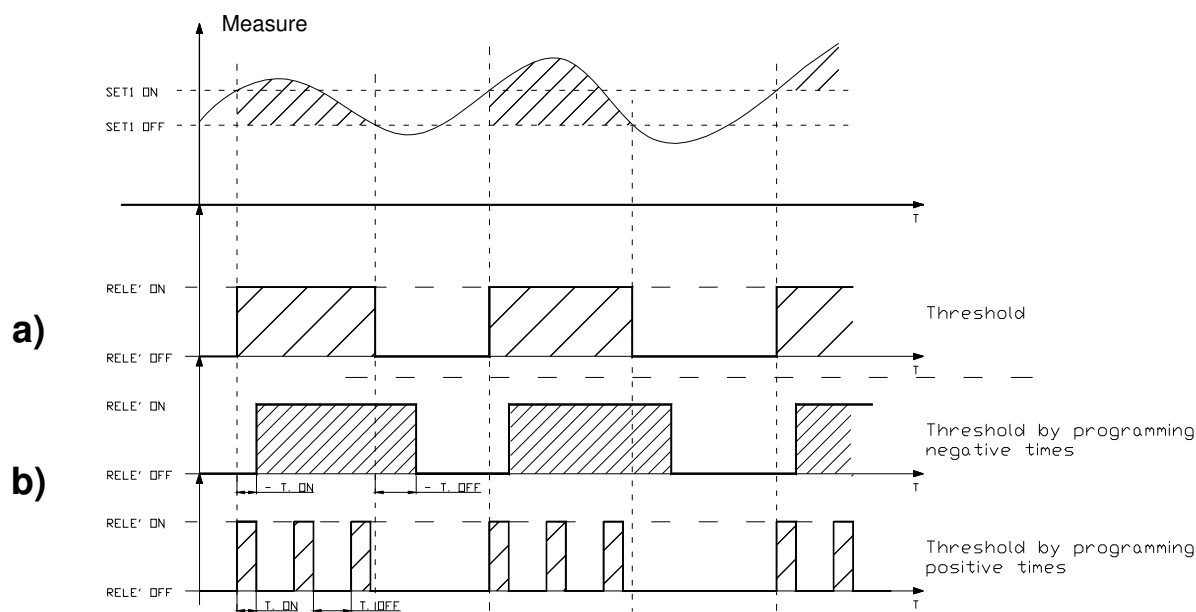


Figure 16 – Operation of Relay 1

E2) PID-PWM

By defining the Set Point as PID-PWM, through Relay 1, it is possible to activate a pump with an ON/OFF command almost as if it had a proportional adjustment. For this function the time period must be programmed (in seconds) within which the calculation of the PWM adjustment will come about. The maximum time that can be programmed is 999 seconds with a 1 second step. We recommend starting with short periods of time and increasing them gradually in order to avoid drastic variations in measuring. For operation of the Relay in a PID-PWM function see fig. 17.b.

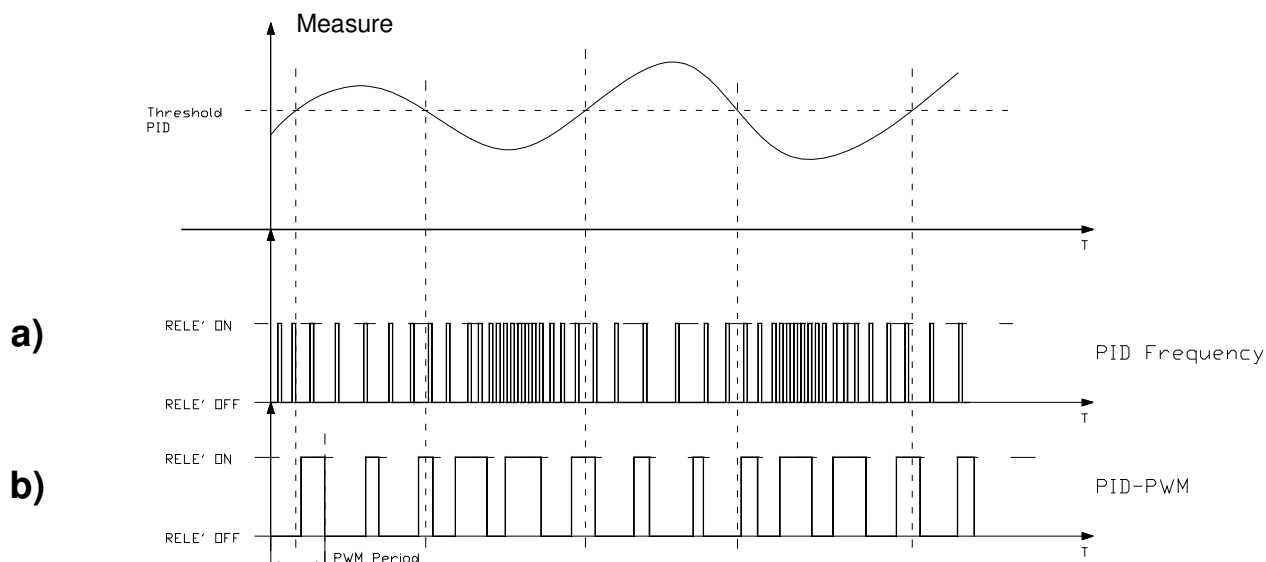


Figure 17 – Operation of Relay 1 as PID

E3) PID-Frequency

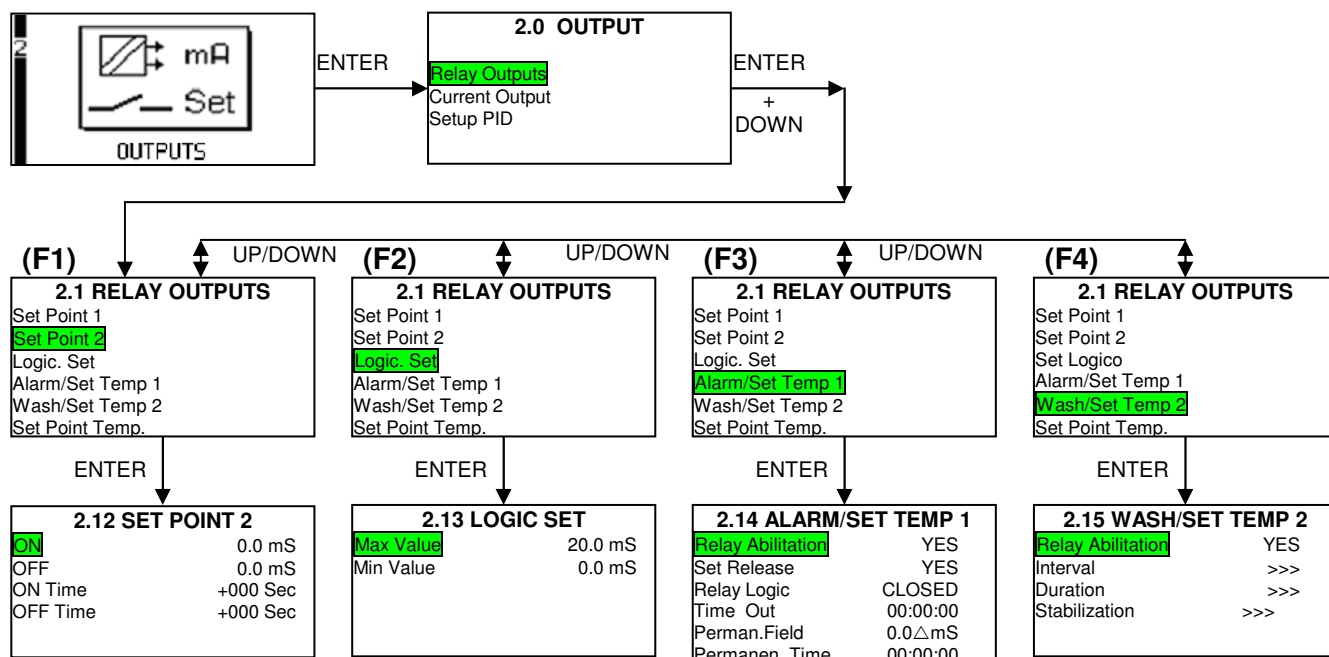
By setting the Set Point as PID-Frequency it is possible, through Relay 1, to control a pump directly with impulse inputs. The maximum number is 7200 imp/h with steps of 200. The ON and OFF impulse time is fixed at 250mSec. For operation of the Relay in a PID-Frequency see fig. 17.a.

NOTE



Functions E2) and E3) are related to the programming of the PID parameters to be found in the menu 2.31 (Par. 4.3.8). Therefore, before programming this function we recommend that you check the programming of the PID parameters.

4.3.5 OUTPUTS MENU (RELAY OUTPUTS – SET POINT 2, ETC.)



F1) Set Point2

The programming parameters of Set Point 2 determine the functioning logic of Relay 2.

This Relay may only be programmed as a Threshold. Programming of threshold 2 is identical to the one described for Threshold 1.

F2) Logical Set

The parameters of the Logical Set determine the functioning of the Alarm Relay. This function is deactivated by default.

This function activates an alarm when the measuring values are located outside of a specific “window”. It is, in reality, possible to programme a minimum value and a maximum value and once they are exceeded the instrument will generate an alarm. This function will allow an alarm to be activated if the measure values are over a certain “range”. In fact, it is possible to program a minimum and a maximum value: when exceeded, the equipment will generate an alarm.

This Logical Set is useful to control any possible faults to the system, eg. Defects in the dosage pumps etc.

F3) Alarm/Set Temp. 1

With this function the basic settings of the Alarm Relay are defined, all of which are handled by the anomaly conditions inside and outside of the instrument.

Considering the importance of this Relay, we recommend that it is connected to a visual and acoustic signal which should always be kept under control by personnel in charge of running the plant, in order to intervene immediately in the case of a signal.

Programming of the Alarm Relay is articulated into 6 functions, therefore allowing for external anomalies (measuring electrode and dosage systems) as well as internal anomalies to be kept under control. Description of the functions:

RELAY ABILITATION

Within this function, it is possible to assign the relay.

Setting “YES” means that the relay works as an alarm. Setting “NO”, the relay is automatically assigned as temperature.

SET RELEASE

With this function it is possible to deactivate or activate dosages in the case of an alarm.

By programming YES, when any kind of alarm is activated, the Relay 1 and 2 contacts will open up immediately and the analogical outlets 1 and 2 will be cancelled.

By programming NO, even in the case of activation of the alarm, the Relay contacts and the analogical outlets will not change their position.

YES is set as a default.

RELAY LOGICS

The Alarm relay is an ON/OFF alarm and with this function it is possible to programme its opening/closing logic. CLOSED is set as a default.

By setting "CLOSED", the Alarm relay will be opened in normal working conditions and will close in the event of an alarm.

By setting "OPEN" it will work in exactly the opposite way. The Alarm relay will close in normal working conditions and will open in the event of an alarm.

Furthermore, by setting OPEN it is also possible to control the anomaly of the absence of power tension which will lead to the immediate opening of the relay.

TIME OUT

With this function it is possible to set a maximum activation time of Set Point 1 and 2 *after which time the alarm will be activated*. This allows for the state of the dosage pumps to be kept under control.

By default this function is deactivated (time 00:00.00). The maximum time that can be programmed is 60 minutes, at steps of 15 seconds.

PERMANENCE FIELD – PERMANENCE TIME

This function allows for the state of functioning of the measuring probe to be kept under control.

If the measurement is stabilised within a certain interval for a period of time that exceeds the time set, the instrument will generate an alarm.

In order to activate this function, the following must be set:

in the "PERMANENCE FIELD" step the minimum oscillation interval of measuring (delta CONDUCTIVITY)

in the "PERMANENCE TIME" the maximum time in which excursion must come about.

If, during the period of time programmed, measuring is always within the interval programmed, the instrument will set off an alarm.

By default this function is deactivated as a delta 0 and a time of 00:00:00 has been programmed. The maximum time that can be programmed is 99 hours at steps of 15 minutes.

F4) Wash/Set Temp. 2

The instrument is fitted with a Washing Relay that can control a solenoid valve for washing of the measuring electrode.

The washing stage lasts 1 minute altogether and it includes 15 seconds for control of the solenoid valve (closing of the washing relay) and 45 seconds for stabilisation of the probe.

RELAY ABILITATION

Within this function, it is possible to assign the relay.

Setting "YES" means that the relay works as wash. Setting "NO", the relay is automatically assigned as temperature.

INTERVAL

With this function it is possible to set the interval of time between one washing stage and the next. Immediately before it starts, the instrument memorizes the values of the measurements, the state of Relay 1 and 2 and the values of the analogical outlets and it keeps them “frozen” for the entire duration of the washing cycle.

This situation is highlighted on the display using an hourglass and, furthermore, instead of the measuring value a counter appears indicating how many seconds are left until the washing stage is completed.

By default this function is deactivated as a time of 00 hours and 00 minutes is programmed. The maximum interval that can be programmed is 24 hours at steps of 15 minutes.

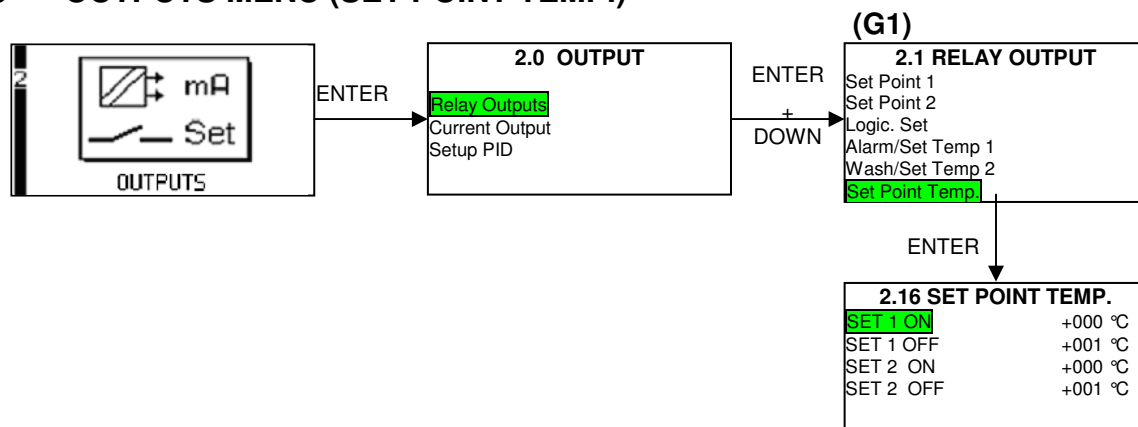
DURATION

Within this function it is possible to set the duration (in seconds) of the washing period.

STABILIZATION

Within this function it is possible to set the time (in seconds) needed to the stabilize the wash.

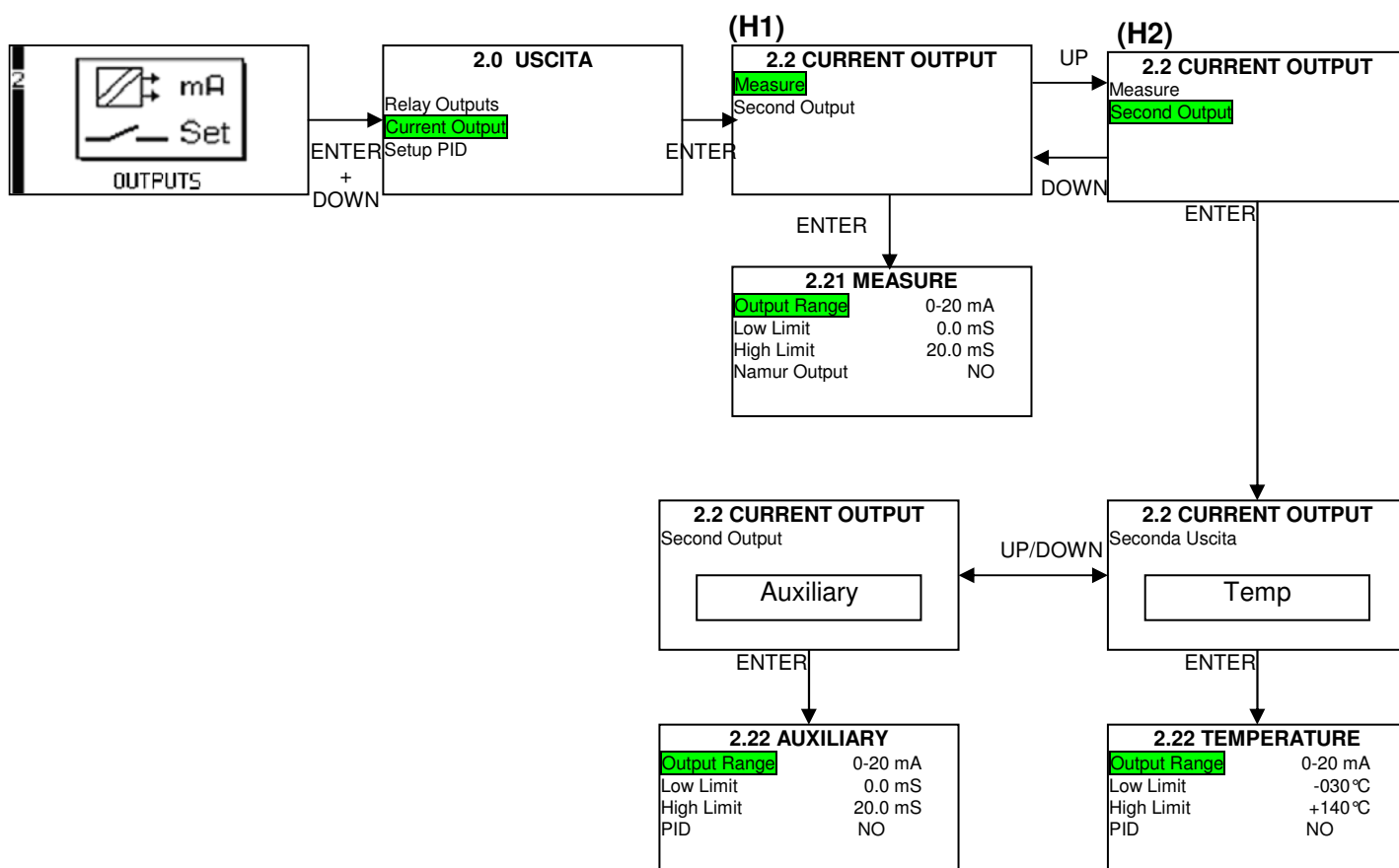
4.3.6 OUTPUTS MENU (SET POINT TEMP.)



G1) Set Point Temp.

If at least one of the two relays in points **F3)**, **F4)** is set as temperature relay, within this step it is possible to set up the Set Point.

4.3.7 OUTPUTS MENU (CURRENT OUTPUT)



The instrument is fitted with two analogical outlets in a current that is separated galvanically and are independent of each other. The first outlet refers to the primary measuring therefore proportional to the Conductivity measured. The second, however, can be programmed between Temperature or CONDUCTIVITY.

H1) Measuring

In this step of the programme 4 functions can be set:

OUTPUT RANGE:

A selection can be made between 0-20mA or 4-20mA. The default is programmed at 0-20mA

LOWER LIMIT:

A Conductivity value at 0 to 4mA of output current can be set. The default is set at 0mS

UPPER LIMIT:

A Conductivity value of 20mA can be set for output current. The default is set at 20.0mS.

The regulation of Lower and Upper Limit functions allow for the scale of analogical outputs to be amplified. Furthermore, the output can be inverted to 20-0mA or 20-4mA

NAMUR OUTPUT:

This function is only activated if chosen as an Outlet Range of 4-20mA. If this function is activated in the case of an alarm, the outward value of the current will be 2.4mA according to the NAMUR standard. The default of this function is deactivated.

H2) Second Output

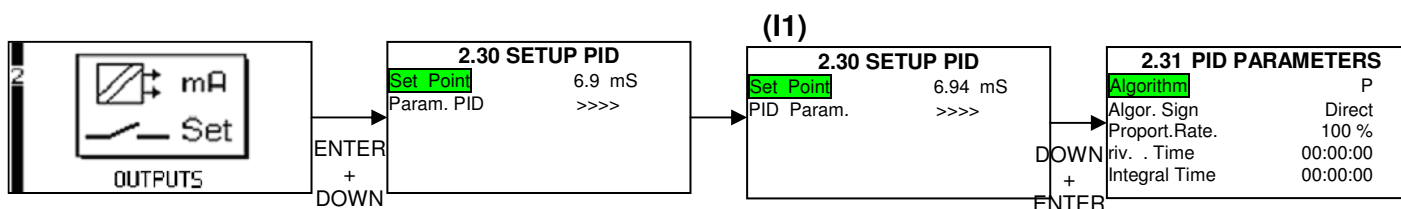
The second output can be set as Temperature, Auxiliary or PID.

If set as Temperature a Range between 0-20mA or 4-20mA can be chosen, the Lower and Upper limits of the Temperature value. For a detailed description of how to set them, refer to point 5.1 Measuring of Analogical Outlet. The default Range is 0-20mA, the Lower Limit is -30°C and the Upper Limit is +140°C.

If set as Auxiliary on the second output also, the conductivity measurement is repeated. But the Range of between 0-20mA or 4-20mA, the Lower limit and the Upper limit of the conductivity values can be chosen, different to the previous ones. For a detailed description of how to set them refer to point 5.1 Measuring of Analogical Outlet. The default Range is 0-20mA, the Lower Limit is 0mS and Upper Limit is 20.0mS.

If set as PID the Output range of between 0-20mA or 4-20mA must be set. For settings of the PID see part C3.

4.3.8 OUTPUTS MENU (SETUP PID)



I1) Setup PID

In this step of the programme, the programming of parameters for PID functioning is carried out. The outlet of PID adjustment is analogical as well as digital and they can both be activated at the same time. The PID outlets are: Analogical Outlet 2 and Relay 1.

The PID function allows for all of the swings due to ON/OFF dosages to be eliminated. Furthermore, it allows for the threshold desired to be maintained and reached with extreme precision. The PID adjustment is a complicated adjustment that must take into account all system variables. This PID has been designed for those general applications with a fast retroactivity of the system. In reality, the maximum integral and derived times are 5 minutes.

The PID function allows for three adjustments to handle the dose.

The PROPORTIONAL (P) Adjustment allows for the outward dimension to be more or less amplified.

The DERIVATIVE (D) function allows for our system to become more or less reactive to variations of the sizes measured.

The INTEGRATIVE (I) function allows for the swings to be regulated due to the derivative part.

Description of functions:

SET POINT

The value of the PID threshold that we want to maintain stable.

PID SETUP

ALGORITHM

The kinds of algorithms handled by the instrument are: P = Proportional ; PI = Proportional – Integral and PID = Proportional – Integral – Derivative

The type of algorithm will be chosen according to the application requested. The P regulation will be set as a default.

THE ALGORITHM SIGN

In this function the PID sign is programmed. If we programme DIRECT it means that as the value measured is increased compared with the threshold defined, the PID value will decrease. However, if we programme OPPOSITE, as the value measured increases compared with the threshold defined, the PID value will increase. DIRECT is set as a default.

PROPORTIONAL

The Proportional Range of the PID regulation compared with the bottom of the scale for the instrument.

Eg. For a conductivity with a range of 0-20mS, if a 100% Proportional is programmed it means having a range of ± 20 mS of regulation compared with the threshold set. Therefore the value of the proportional is inversely proportional to the outlet, that is to say as the percentage of the proportional is increase the effects on the outlet decrease. Regulation of the proportional may vary between 1 and 500% in steps of 1%. The default is set at 100%.

DERIVATIVE TIME

The Derivative part is set. The more the programmed time increases, the more the system will be ready for variations to the measurement. The derivative time can be programmed between 0 and 5 minutes at steps of 5 seconds. The default is programmed at 0 minutes.

INTEGRAL TIME

The Integrative part is set. The more the programmed time increases, the more the system will mediate with the measuring swings. The derivative time can be programmed between 0 and 5 minutes at steps of 5 seconds. The default is programmed at 1 minute.

4.3.9 CALIBRATIONS MENU

This programme phase allows for the instrument calibration with the electrode used. Calibration must be carried out:

- When starting the measure instrument / electrode chain the first time
- Every time the electrode is replaced
- When starting the instrument after a long inactivity period
- In the case of any discrepancies compared with the known value

For granting a proper working, further to the above mentioned conditions, it will be required to check the calibration of or to recalibrate the instrument periodically.

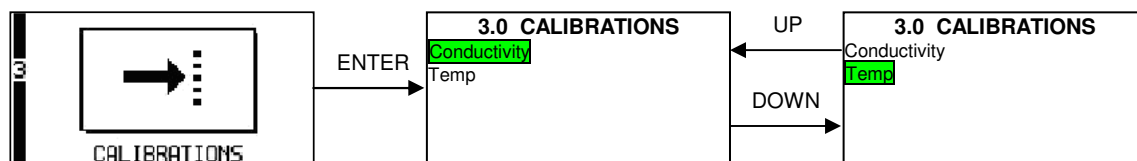
User will determine the frequency of this operation, keeping into account the application and the electrode use.

NOTE



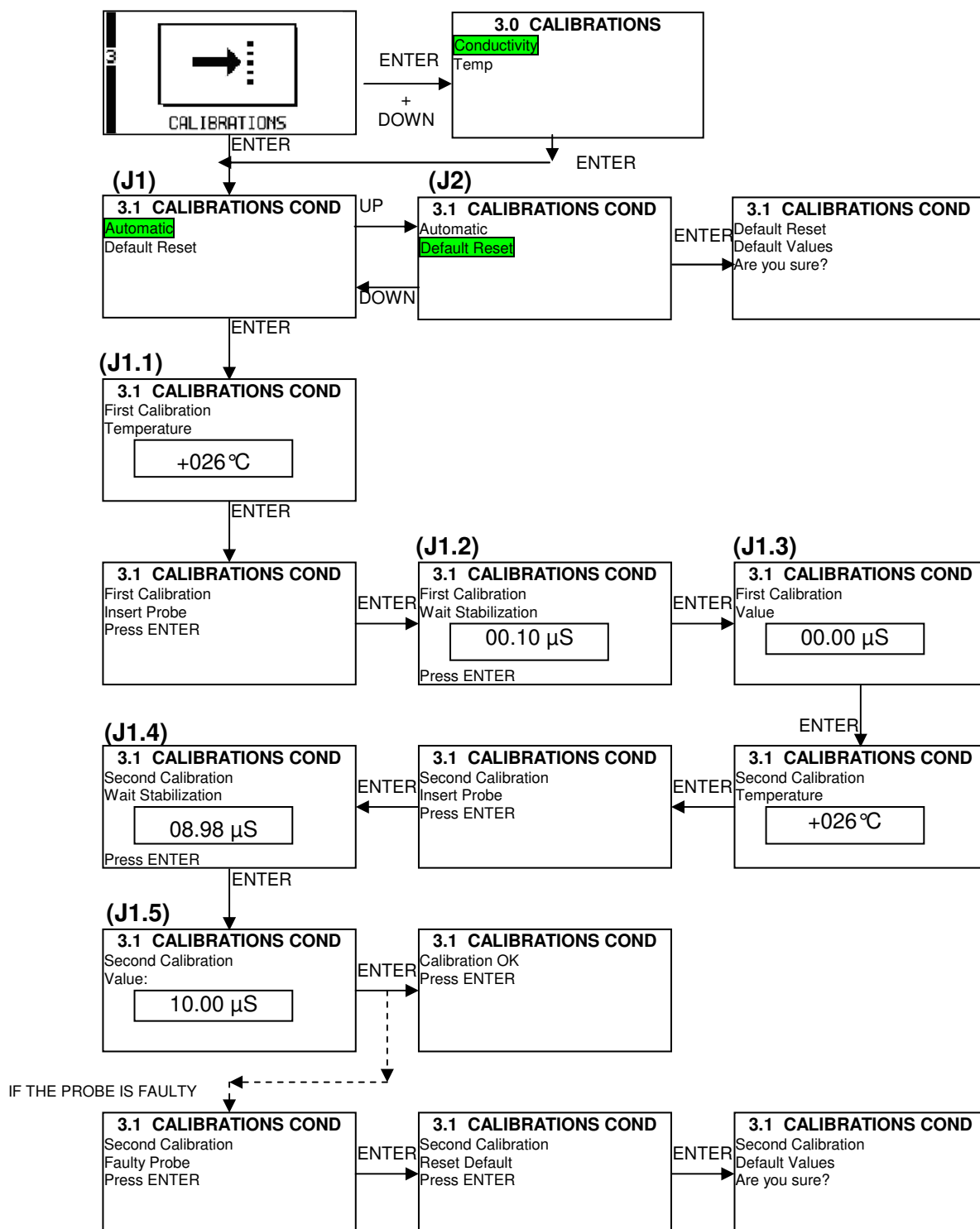
We remind you that before carrying out any checks or recalibrations, the electrode must be cleaned thoroughly with clean water, making it stabilizing for at least 30 minutes on the atmosphere or into the known title solution.

Descriptions of the calibration functions:



From this menu it is possible to choose the type of calibration: Conductivity or Temperature

4.3.9.1 Conductivity calibration



J1) Automatic system

The conductivity calibration foresees two calibration points.

J.1.1) The first calibration must be done at $0\mu\text{S}$!! After inputting the temperature compensation value (if the conductivity probe is temperature compensated, the temperature value will be read automatically) press ENTER key and dip the probe into a solution at $0\mu\text{S}$ or expose it to air after proper drying. Press ENTER.

J.1.2) Wait for the displayed value, read by the probe, to stabilize, then press ENTER.

J.1.3) The instrument will display the $0000\mu\text{S}$ value automatically. Press ENTER.

J.1.4) and J.1.5) Calibrate the second point as per the first one. On this step, solutions with known title and different concentrations can be used and inserted by pressing the UP and DOWN keys.

The calibration solution can be selected referring to the working range where the probe will work in. Example: If the working range is between 500 and $1000\mu\text{S}$, use a solution at approx. $750\text{--}800\mu\text{S}$ as second point.

Once finished the second point calibration, the instrument will check the calibration data compliance. If correct, the instrument will display “Calibration OK”; if not “Faulty probe”.

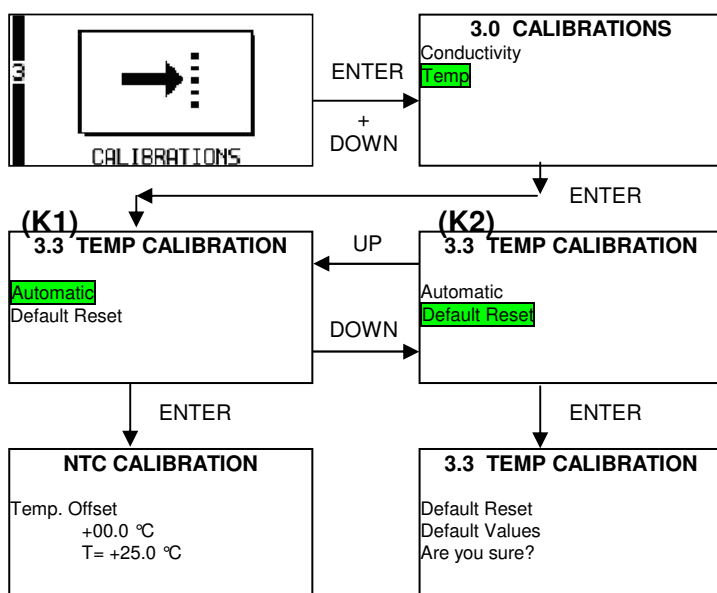
If “Faulty Probe” is displayed, we recommend:

- To check the physical probe integrity.
- To check the cable integrity, the correct connection to the instrument and on the probe.

J2) Default Reset

This step of the programme allows for the calibration factors to be reset to the original factory ones. To be used when incorrect calibrations are confirmed.

4.3.9.2 Temperature calibration



The calibration of Temperature allows to align the values given by the temperature sensor to the real analysis values; this step must be done only if the operator finds a few differences between the values given by the instrument and the real temperature.

K1) Automatic Calibration

The calibration consists in adding or subtracting an offset in order to bring back the value given by the instrument to the correct measure.

K2) Reset Default

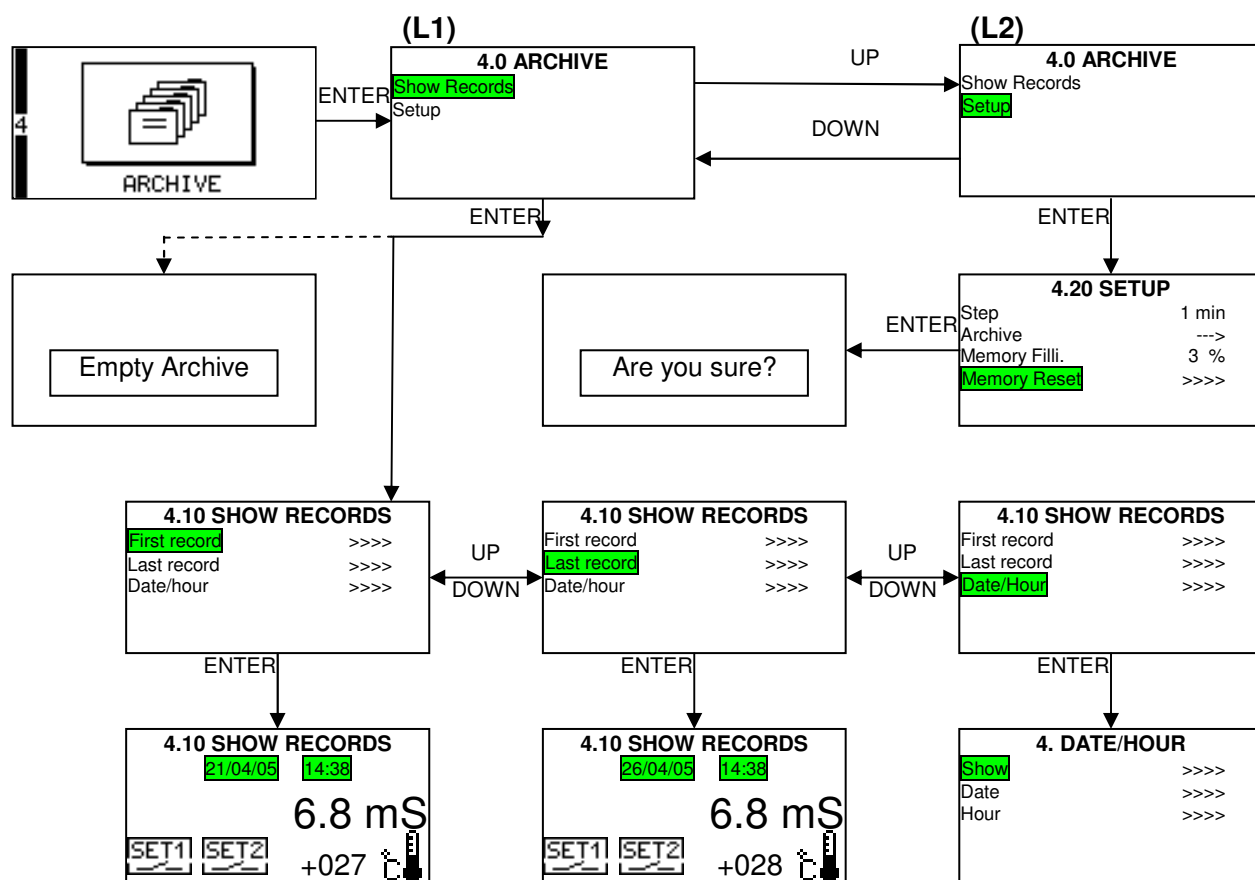
As shown in J2) step, this step of the programme allows for the calibration factors to be reset to the original factory ones..

4.3.10 ARCHIVE MENU

The instrument is fitted with a Data Logger that allows for 16,000 records to be stored. Each record contains: the date, the time and the Conductivity value, the temperature value, the value of the Threshold 1 and 2, the state of the Relays 1 and 2 and the state of the Alarm Relay. The archive must be of a Circular kind, therefore once filled the next data will overwrite the oldest one and so on until it is completely FILLED, that is to say once it is filled storage is blocked and the full archive icon will appear.



The archive can be examined directly through the instrument in the form of a table or drawing. The archive may be downloaded using a RS485 serial port with the MOD BUS RTU protocol.



L1) Visualise data

In this part of the programme it is possible to visualise data in the form of a table as long as the archives are not empty. In order to decide on where to start and examine the table, there are three options:

First Data >>> You will start by examining the archive of the first data stored and move forward

Last Data >>> You will start by examining the archive of the last data stored and move backwards
Date/Time>>> You will start by examining the archive from a specific date and time
In order to move backwards and forwards use the UP and DOWN keys and once you reach the first or last data it will stop.

L2) Set-up

In this part of the programme the storage parameters are set using 4 functions:

STEP

It indicates the registration step and it can be programmed at between 0 and 99 minutes. The default is 0 minutes, therefore deactivated, and it can be increased by 1 minute at a time.

ARCHIVE TYPE

Circulation of “⇌” of the Archive once it is full and it will write over the first data
Filling “→” Once it is full it will stop storage

SPACE USED

It indicates the amount of memory used up by the data stored.

MEMORY RE-SET

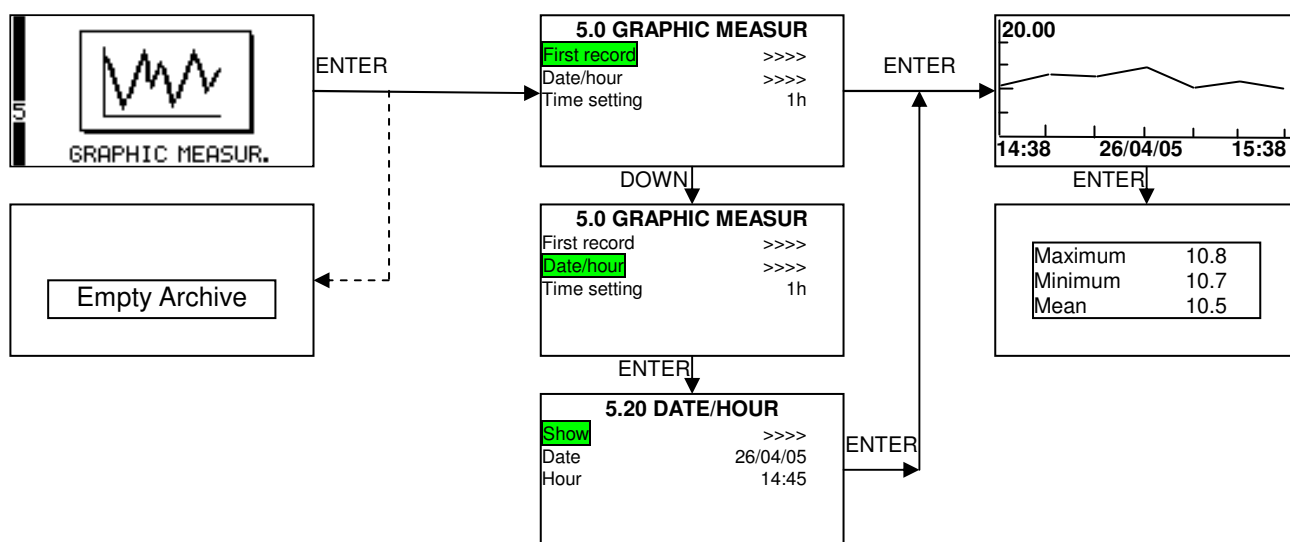
It is used to clean the memory.

CAUTION



Once this operation is carried out all measurements stored will be lost.

4.3.11 MEASURING GRAPHICS MENU



In this step of the programme you can see data in a graphic form, as long as the archive is not empty. In order to decide from where to start to examine the graphics and tables, there are two options:

First Data >>> You will start by examining the archive of the first data stored and move forward
Date/Time>>> You will start by examining the archive from a specific date and time

In order to move backwards and forwards use the UP and DOWN keys and once you reach the first or last data it will stop.

The Times item indicates for how many hours we want to visualise the drawing. The default is 1 hour but we can choose from 1, 6 or 24 hours.

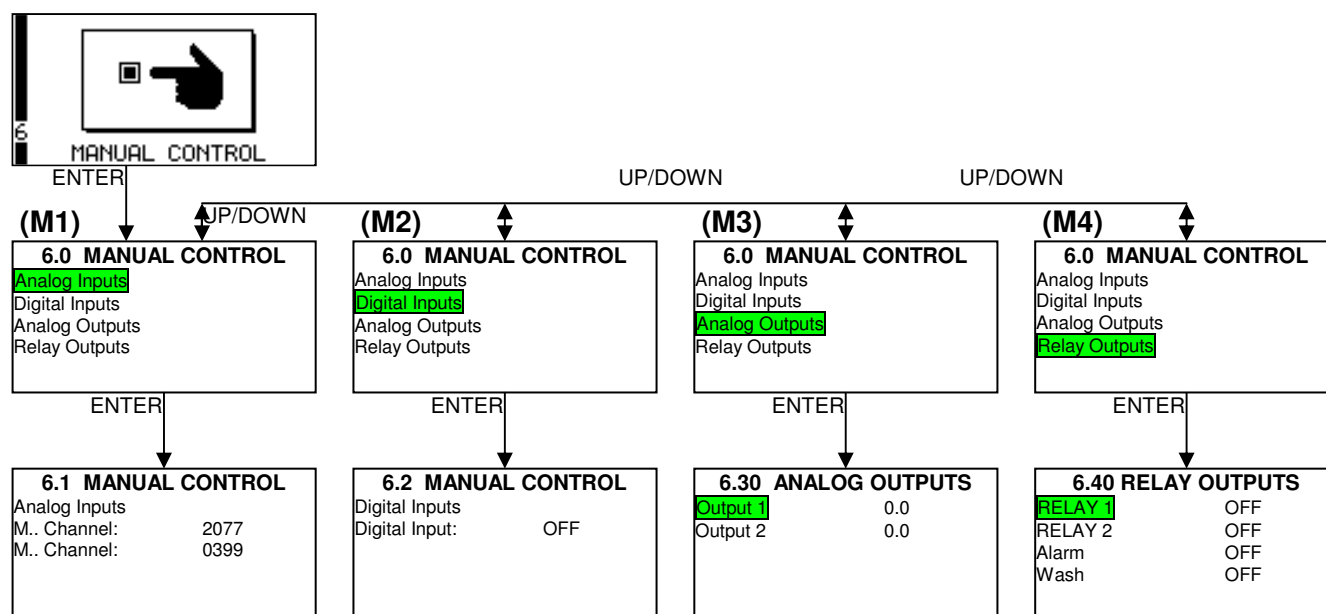
NOTE



Once the drawing is visualised, if the ENTER key is pressed a table will appear indicating the Minimum, Maximum and Average value of the measurements visualised on the screen. Furthermore, if the ENTER key is pressed again, a ZOOM of the data visualised will appear. If the ENTER key is pressed again, it will return to the initial visualisation.

The ZOOM allows for a clearer evaluation of small Conductivity variation..

4.3.12 MANUAL CONTROL MENU



This step of the programme is useful for all functional controls eg. Upon installation to check functioning of the entire system.

M1) Analogical Inputs

This function allows for the values read by the digital analogical converter related to the Conductivity and temperature measuring to be seen directly.

This allows you to understand if the level of analogical acquisition of the instrument works correctly.

M2) Digital Inputs

The instrument is fitted with a passive digital input, separated galvanically, which allows for the doses to be deactivated, on the Relay and also on the Analogical Outlets. This step allows you to check whether or not the digital input of dosage deactivation works correctly. If it is Open it must indicate OFF and if, however, tension is applied to the clamps, according to specifications, the instrument should indicate ON.

M3) Analogical Outputs

It allows for manual simulation of both the Analogical Outputs under current. The variations of the outputs have a pass of 0.1mA.

M4) Relay Outputs

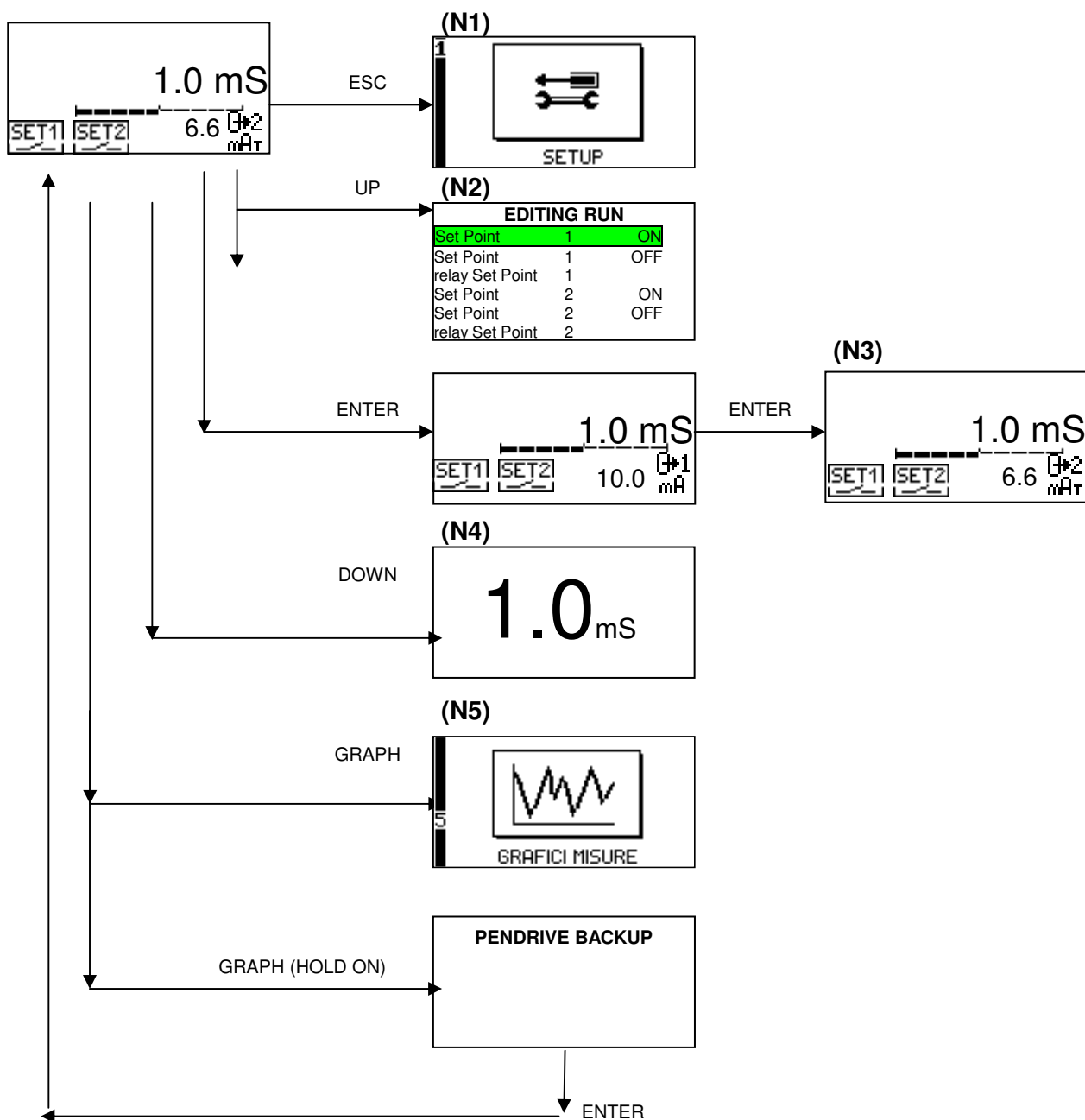
It allows for manual activation of the Relay Outputs

CAUTION



When exiting from the “MANUAL CONTROL” function, all the possible manual settings will be reset.

4.3.13 FUNCTIONS IN RUN



In the RUN screen the following things can be seen:

- Dissolved Conductivity measure
- Percent value compared to full scale (bargraph)
- the status and type of programming of Relays 1 and 2
- Status of Digital Input
- Status of the Alarm Relay
- Status of the Washing Relay
- Status of the Password
- Status of measuring and outlet freezing
- Value of the Temperature or of the Analogical Outlet 1 or of the Analogical Outlet 2
- System errors
- Storage of Data in the Archive
- Archive Full

N1) Pressing the ESC key

By pressing this key you will enter the Instrument Programming stage and all measuring and dosage functions will be deactivated. Caution: the instrument will not leave this stage automatically and therefore if it is left in the Instrument Set-up it will never carry out any operation.

In the Instrument Set-up stage, serial communication is also deactivated.

N2) The UP key

It visualises the status and the value of the Set Point 1 and 2 without blocking the operation of the instrument or stopping the pump.

N3) The ENTER key

It visualises the value of Temperature of the value of the Analogical outlet 1 or the value of the Analogical outlet 2 at the bottom of the display.

N4) The DOWN key

It is possible to ZOOM on the primary measure.

N5) The GRAPH key

It is possible to visualise directly the GRAPHIC MEASURE menu.

OPTIONAL: Holding the GRAPH key for 3-4 seconds during the run functions

It visualises the PENDRIVE BACK UP menu (Optional), through which it is possible to download data on an USB stick (ONLY FOR WALL MOUNTING VERSION).

5 USER MAINTENANCE

5.1 SPECIAL CAUTIONS FOR CRITICAL COMPONENTS

An LCD (Liquid Crystal Display) is incorporated into the equipment and it contains small amounts of toxic materials.

In order to avoid damages to people and to limit the negative effects on the environment, comply with the following instructions:

Display LCD:

- The LCD display of the electronic device is fragile (it is made of glass) and therefore should be handled with extreme care. For this reason we recommend that the device is protected in its original packaging during transport or when not in use.
- If the glass of the LCD breaks and liquid spills out, make sure that you do not touch it. Wash every part of the body that may have come into contact with the liquid for at least 15 minutes. If, once this operation has been carried out, you notice any symptoms consult a doctor immediately.

6 MODBUS PROTOCOL

Main features

- Protocollo MODBUS standard tipo RTU
- Layer fisico: RS485 a due fili (half-duplex)
- Layer fisico alternativo: USB
- 8 bit, Parità N, 1 Stop bit
- Baud-rate: da 300 a 38400 bps, impostabile da menù
- ID scheda: da **1** a **255**, impostabile da menù

Function 01 (Read Coil Status)

```

00 Stato fisico relay RL0-K1 (Set 1)
01 Stato fisico relay RL1-K2 (Set 2)
02 Stato fisico relay RL2-K5 (Allarme / Set Temp. 1)
03 Stato fisico relay RL3-K6 (Wash / Set Temp. 2)
04 Stato Set Point 1
05 Stato Set Point 2
06 Flag Allarme Time Out Set Point 1
07 Flag Allarme Time Out Set Point 2
08 Flag Allarme Set Logico Min
09 Flag Allarme Set Logico Max
10 Flag per lavaggio o stabilizzazione in corso

```

Function 02 (Read Input Status)

```

00 Tipo uscita mA1 (0=0-20 mA, 1=4-20 mA) (out1_typ)
01 Tipo uscita mA2 (0=0-20 mA, 1=4-20 mA) (out2_typ)
02 Uscita Namur (0=Disattiva, 1=Attiva) (namur_flag)
03 Flag per sgancio su allarme (0=sgancio, 1=non sgancio) (alrel_flag)
04 Flag per tipo di Temperatura (0=°C, 1=°F) (fahren_flag)
05 Segno Algoritmo PID (0=Diretta, 1=Inversa) (pid_cnsgn)
06 Logica Relè Allarme in ON (0=Chiuso, 1=Aperto) (alrlog_flag)
07 Funzionamento Analog Out 2 (0=Proporzionale, 1=PID) (pid2_flag)
08 Tipo Archivio (0=Riempimento, 1=Circolare) (reg_typ)
09 Compensazione della temperatura (0=Automatica, 1=Manuale) (tmpc_flag)
10 Tipo strumento (0=Analogico, 1=Digitale) (DigitalProbe)
11 Assegnazione Analog Out 2 (0=Misura principale, 1=Temp)
12 Assegnazione relè RL2 (0=Allarme, 1=Set Point 1 Temperatura)
13 Assegnazione relè RL3 (0=Wash, 1=Set Point 2 Temperatura)

```

Function 03 (Read Holding Registers)

2 registri consecutivi relativi ai 4 byte che compongono la variabile floating point (ad eccezione dell'indirizzo 00 che è relativo alla classe dello strumento ed è costituito da 4 caratteri ASCII). Dato che ogni valore è su due registri Modbus (4 bytes) e che i valori iniziano su registri di indirizzo pari, è stato introdotto un controllo che lo Starting Address dei registri richiesti sia pari e che il numero dei registri richiesti sia anch'esso pari. Altrimenti si ottiene una risposta con errore di indirizzamento. (se si utilizza il programma Modbus Poll, visualizzare in modalità "Float Inverse")

```

00 Classe strumento ('4223') 4 bytes ASCII
02 Matricola strumento (0...65535)
04 Main Value (Conducibilità)
06 Valore della temperatura in °C
08 Valore Uscita analogical in mA
10 Valore Uscita analogica2 in mA
12 Set 1 ON (set1_on)
14 Set 1 OFF (set1_off)
16 Set 2 ON (set2_on)
18 Set 2 OFF (set2_off)
20 Set Max (set_max)

```

```

22 Set Min (set_min)
24 Limite basso Analog Out 1 (Misura Principale) (clim1_low)
26 Limite alto Analog Out 1 (Misura Principale) (clim1_high)
28 Limite basso Analog Out 2 (Misura Principale / Temperatura) (clim2_low)
30 Limite alto Analog Out 2 (Misura Principale / Temperatura) (clim2_high)
32 Set Temperatura 1 ON (set1T_on)
34 Set Temperatura 1 OFF (set1T_off)
36 Set Temperatura 2 ON (set2T_on)
38 Set Temperatura 2 OFF (set2T_off)
40 PID: valore soglia (set_pid)
42 PID: range proporzionale (pid_prange)
44 PID: minuti per Derivata (pid_tvmin)
46 PID: secondi per Derivata (step 5 sec) (pid_tvsec)
48 PID: minuti per Integrare (pid_tnmin)
50 PID: secondi per Integrare (step 5 sec) (pid_tnsec)
52 PID: tipo algoritmo PID (0=P, 1=PI, 2=PID) (pid_cntyp)
54 Temperatura di compensazione in manuale (tmp_com)
56 Ore intervallo lavaggio (wash_hour)
58 Minuti intervallo lavaggio (wash_min)
60 Secondi durata lavaggio (wash_lenght)
62 Minuti per allarme temporizzato (alr_min)
64 Secondi per allarme temporizzato (alr_sec)
66 Duty per Set1 ON (duty1_on)
68 Duty per Set1 OFF (duty1_off)
70 Duty per Set2 ON (duty2_on)
72 Duty per Set2 OFF (duty2_off)
74 Campo Permanenza (meas_perm)
76 Tempo Permanenza ore (cpalr_hour)
78 Tempo Permanenza_min (step 15min) (cpalr_hour)
80 Intervallo registrazioni archivio (reg_min)
82 Giorno
84 Mese
86 Anno (formato esteso con secolo)
88 Ora
90 Minuti
92 Logica Relè 1 (0=Soglia, 1=PWM, 2=Frequenza) (set1_typ)
94 Periodo del PWM max 999 sec (set1_pid_period)
96 MAX Frequenza imp/h (max. 7200 regolazione a 200 step) (set1_pid_freq)
98 Range(0=2uS, 1=20uS, 2=200uS, 3=2000uS, 4=20mS, 5=200mS, 6=2) (ran_ind)

```

Function 04 (Read Input Registers)

2 registri consecutivi relativi ai 4 byte che compongono la variabile floating point.

Dato che ogni valore è su due registri Modbus (4 bytes) e che i valori iniziano su registri di indirizzo pari, è stato introdotto un controllo che lo Starting Address dei registri richiesti sia pari e che il numero dei registri richiesti sia anch'esso pari. Altrimenti si ottiene una risposta con errore di indirizzamento. (se si utilizza il programma Modbus Poll, visualizzare in modalità "Float Inverse")

```

00 Main Value (Conducibilità)
02 Valore della temperatura in °C
04 Valore Uscita analogical in mA
06 Valore Uscita analogica2 in mA

```

Function 05 (Force Single Coil)

```

00 Tipo uscita mA1 (0=0-20 mA, 1=4-20 mA) (out1_typ)
01 Tipo uscita mA2 (0=0-20 mA, 1=4-20 mA) (out2_typ)
02 Uscita Namur (0=Disattiva, 1=Attiva) (namur_flag)
03 Flag per sgancio su allarme (0=sgancio, 1=non sgancio) (alrel_flag)

```

```

04 Flag per tipo di Temperatura (0=°C, 1=°F) (fahren_flag)
05 Segno Algoritmo PID (0=Diretta, 1=Inversa) (pid_cnsn)
06 Logica Relè Allarme in ON (0=Chiuso, 1=Aperto) (alrlog_flag)
07 Funzionamento Analog Out 2 (0=Proporzionale, 1=PID) (pid2_flag)
08 Tipo Archivio (0=Riempimento, 1=Circolare) (reg_typ)

```

Function 16 (Preset Multiple Registers)

2 registri consecutivi relativi ai 4 byte che compongono la variabile floating point.

Dato che ogni valore è su due registri Modbus (4 bytes) e che i valori iniziano su registri di indirizzo pari, è stato introdotto un controllo che lo Starting Address dei registri richiesti sia pari e che il numero dei registri richiesti sia anch'esso pari. Altrimenti si ottiene una risposta con errore di indirizzamento.

```

00 -----
02 Matricola strumento (0...65535)
04 -----
06 -----
08 -----
10 -----
12 Set 1 ON (set1_on)
14 Set 1 OFF (set1_off)
16 Set 2 ON (set2_on)
18 Set 2 OFF (set2_off)
20 Set Max (set_max)
22 Set Min (set_min)
24 Limite basso Analog Out 1 (Misura Principale) (clim1_low)
26 Limite alto Analog Out 1 (Misura Principale) (clim1_high)
28 Limite basso Analog Out 2 (Misura Principale / Temperatura) (clim2_low)
30 Limite alto Analog Out 2 (Misura Principale / Temperatura) (clim2_high)
32 Set Temperatura 1 ON (set1T_on)
34 Set Temperatura 1 OFF (set1T_off)
36 Set Temperatura 2 ON (set2T_on)
38 Set Temperatura 2 OFF (set2T_off)
40 PID: valore soglia (set_pid)
42 PID: range proporzionale (pid_prange)
44 PID: minuti per Derivata (pid_tvmin)
46 PID: secondi per Derivata (step 5 sec) (pid_tvsec)
48 PID: minuti per Integrare (pid_tnmin)
50 PID: secondi per Integrare (step 5 sec) (pid_tnsec)
52 PID: tipo algoritmo PID (0=P, 1=PI, 2=PID) (pid_cntyp)
54 Temperatura di compensazione in manuale (tmp_com)
56 Ore intervallo lavaggio (wash_hour)
58 Minuti intervallo lavaggio (wash_min)
60 Secondi durata lavaggio (wash_lenght)
62 Minuti per allarme temporizzato (alr_min)
64 Secondi per allarme temporizzato (alr_sec)
66 Duty per Set1 ON (duty1_on)
68 Duty per Set1 OFF (duty1_off)
70 Duty per Set2 ON (duty2_on)
72 Duty per Set2 OFF (duty2_off)
74 Campo Permanenza (meas_perm)
76 Tempo Permanenza ore (cpalr_hour)
78 Tempo Permanenza_min (step 15min) (cpalr_hour)
80 Intervallo registrazioni archivio (reg_min)
82 Giorno
84 Mese
86 Anno (formato esteso con secolo)
88 Ora
90 Minuti
92 Logica Relè 1 (0=Soglia, 1=PWM, 2=Frequenza) (set1_typ)

```

94 Periodo del PWM max 999 sec (set1_pid_period)
96 MAX Frequenza imp/h (max. 7200 regolazione a 200 step) (set1_pid_freq)

Scarico archivi a blocchi di record

Sequenza:

1. Richiesta lunghezza singolo record.
2. Richiesta numero record presenti.
3. Richiesta record corrente
4. Ciclo per acquisizione record
 - a. Se richiesta precedente a buon fine → Richiesta record successivo
 - b. Se richiesta precedente NON a buon fine → Richiesta record corrente
 - c. Se numero ricevuti inferiore al totale → Ripeti ciclo.
5. Chiusura connessione.

N.B. La richiesta del numero di record presenti resetta il puntatore al record inviato per cui la successive richiesta di invio record riparte dal primo record memorizzato

Elenco Funzioni:

Lunghezza singolo record [HIST_ARC_REC_LEN = 0x41]

Scarico records [HIST_ARC_REC_FN = 0x44]

Sottofunzioni:

Numero records in archivio [BHIST_ARC_NUM_REC = 0x03]

Invio blocco attuale di records [BHIST_ARC_BLOCK_CURRENT = 0x04]

Invio blocco successivo di records [BHIST_ARC_BLOCK_NEXT = 0x05]

Resetta archivio [HIST_ARC_RESET = 0x45]

Descrizione funzioni:

Richiesta lunghezza singolo record

Richiesta

Byte	Descrizione
0	Numero Slave Periferica
1	HIST_ARC_REC_LEN = 0x41 (Funzione)
2	CRC (lo)
3	CRC (hi)

Risposta

Byte	Descrizione
0	Numero Slave Periferica
1	HIST_ARC_REC_LEN = 0x41 (Funzione)
2	'2' lunghezza dati
3	Lunghezza Record (lo)
4	Lunghezza Record (hi)
5	CRC (lo)
6	CRC (hi)

Richiesta numero record presenti (con reset del puntatore)

Richiesta

Byte	Descrizione
0	Numero Slave Periferica
1	BHIST_ARC_FN = 0x44 (Funzione)
2	BHIST_ARC_NUM_REC = 0x03 (Sottofunzione)
3	CRC (lo)
4	CRC (hi)

Risposta

Byte	Descrizione
0	Numero Slave Periferica
1	BHIST_ARC_FN = 0x44 (Funzione)
2	BHIST_ARC_NUM_REC = 0x03 (Sottofunzione)
3	Numero Records (lo)
4	Numero Records (hi)
5	CRC (lo)
6	CRC (hi)

Richiesta record corrente

Richiesta

Byte	Descrizione
0	Numero Slave Periferica
1	BHIST_ARC_FN = 0x44 (Funzione)
2	BHIST_ARC_BLOCK_CURRENT = 0x04 (Sottofunzione)
3	CRC (lo)
4	CRC (hi)

Risposta

Byte	Descrizione
0	Numero Slave Periferica
1	BHIST_ARC_FN = 0x44 (Funzione)
2	BHIST_ARC_BLOCK_CURRENT = 0x04 (Sottofunzione)
3	Lunghezza Dati (lo)
4	Lunghezza Dati (hi)
5	Dati ...
.	
n	
.	
6+n	CRC (lo)
7+n	CRC (hi)

Richiesta record successivo

Richiesta

Byte	Descrizione
0	Numero Slave Periferica
1	BHIST_ARC_FN = 0x44 (Funzione)
2	BHIST_ARC_BLOCK_NEXT = 0x05 (Sottofunzione)
3	CRC (lo)
4	CRC (hi)

Risposta

Byte	Descrizione
0	Numero Slave Periferica
1	BHIST_ARC_FN = 0x44 (Funzione)
2	BHIST_ARC_BLOCK_NEXT = 0x05 (Sottofunzione)
3	Lunghezza Dati (lo)
4	Lunghezza Dati (hi)
5	Dati ...
.	
n	
.	
6+n	CRC (lo)
7+n	CRC (hi)

Se Lunghezza Dati=0 : si è richiesto un record oltre il numero di record presenti

Richiesta reset archivio

Richiesta

Byte	Descrizione
0	Numero Slave Periferica
1	HIST_ARC_RESET = 0x45 (Funzione)
2	CRC (lo)
3	CRC (hi)

Risposta

Byte	Descrizione
0	Numero Slave Periferica
1	HIST_ARC_RESET = 0x45 (Funzione)
2	CRC (lo)
3	CRC (hi)

Lunghezza record

Ogni record è lungo 33 bytes (= RECORDSIZE)

Formato record

Offset	variabile	Descrizione	N°Bytes	Formato
0	AA	Anno (binario 0...99)	1	char
1	MM	Mese (binario 1...12)	1	char
2	GG	Giorno (binario 1...31)	1	char
3	hh	Ora (binario 0...23)	1	char
4	mm	Minuto (binario 0...59)	1	char
5	main_val	Valore misura (Conducibilità)	4	float
9	set1_on	Valore di Set 1 ON	4	float
13	set1_off	Valore di Set 1 OFF	4	float
17	set2_on	Valore di Set 2 ON	4	float
21	set2_off	Valore di Set 2 OFF	4	float
25	tp_val	Temperatura	4	float
29		Stato Relays (*)	1	char
30		Spare	1	char
31		Spare	1	char
32		Checksum (somma a 8 bit dei 32 bytes precedenti)	1	char

(*) Bit di Stato Relè

bit0 = RL0 (Set Point 1)
bit1 = RL1 (Set Point 2)
bit2 = RL2 (Allarme / Set Point Temperatura 2)
bit3 = RL3 (Wash / Set Point Temperatura 1)

7 WARRANTY

Chemitec s.r.l. will replace or repair at its own sole option, those parts that may eventually manifest defects in manufacturing or operating, despite of a diligent and proper use by the customer.

The defective product, or considered such, must be sent free of charge to the Chemitec Factory, via I. Newton 28, 50018 Scandicci, Florence (Italy) and will be returned, after the reparation, at purchaser's expense. In order to activate the warranty, a detailed written request should be sent to Chemitec s.r.l., specifying failures or disruptions complained within 12 (twelve) months from the date of installation with a maximum of 18 (eighteen) months from date of shipment.

Are excluded from the warranty, then at purchaser's charge, the costs of performance of our staff for operations offsite, except the hours of work. The travel's time and expenses, meals, etc. will be charged according to ANIE rates.

Components subject of natural wear and glass-parts are excluded from the warranty. The warranty lapses only if the equipment were manipulated by someone not belonging to our company or without our explicit authorization.

THE EQUIPMENT 'S TESTING IS PERFORMED AT THE CHEMITEC SRL COMPANY OF SCANDICCI (FI).

The certificate can be provided upon request at the price indicated in our current price list.

CHEMITEC SRL

8 REQUEST FOR ASSISTANCE

8.1 PROCEDURE OF REQUEST FOR TECHNICAL ASSISTANCE

In the case of a fault to the equipment or in the case of partial or incorrect functioning that cannot be resolved through the ordinary maintenance operations described in this manual or in the documentation attached, we kindly ask you to contact a CHEMITEC office or branch or your nearest dealer or authorised assistance centre.

CAUTION



If the equipment has any faults or starts to operate incorrectly and in any case in a way that does not comply with the contents of the user manual with special reference to the aspect of safety, **YOU SHOULD IMMEDIATELY SUSPEND USE** of the equipment and contact technical assistance. Do not use the equipment until all safety requirements have been checked and restored.

NOTE



In order to accelerate all starting procedures related to assistance intervention and to facilitate identification of the problem by specialised technical staff, we kindly ask you to fill in the form on this page before your telephone contact.
The information related to the equipment can be taken from the details indicated on the equipment plate.

REQUEST FOR TECHNICAL ASSISTANCE

Name of the equipment/system

Code/catalogue number

Serial number (SN).....

Version of current software (Rel)

8.2 MAIN CHEMITEC OFFICES

OPERATIVE OFFICES

CHEMITEC s.r.l.

Operating centre:

Via Isaac Newton, 28

50018 Scandicci

FIRENZE – Italy

Tel. 0039 55 7576801 - Fax 0039 55 756697

E-mail: sales@chemitec.it

Web site: www.chemitec.it