USER MANUAL

Section 2:
TEx
User manual

ENGLISH

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> Introduction

TE✕ is an applicative programme designed and developed by **TERMOELETTRONICA** to improve in a simple, efficient and advanced way all diagnostic functions, monitoring, control and automation of the machines used in the productive processes of a dye-house.

TE✕ programme can be installed on industrial Personal Computers of **PC✕** series. Its configuration can be either STANDARD (complete with functional keyboard, mushroom-head push-button for emergency, lighted push-buttons and key-selector) or FLAT (simplified configuration)

PC✕: 220V version

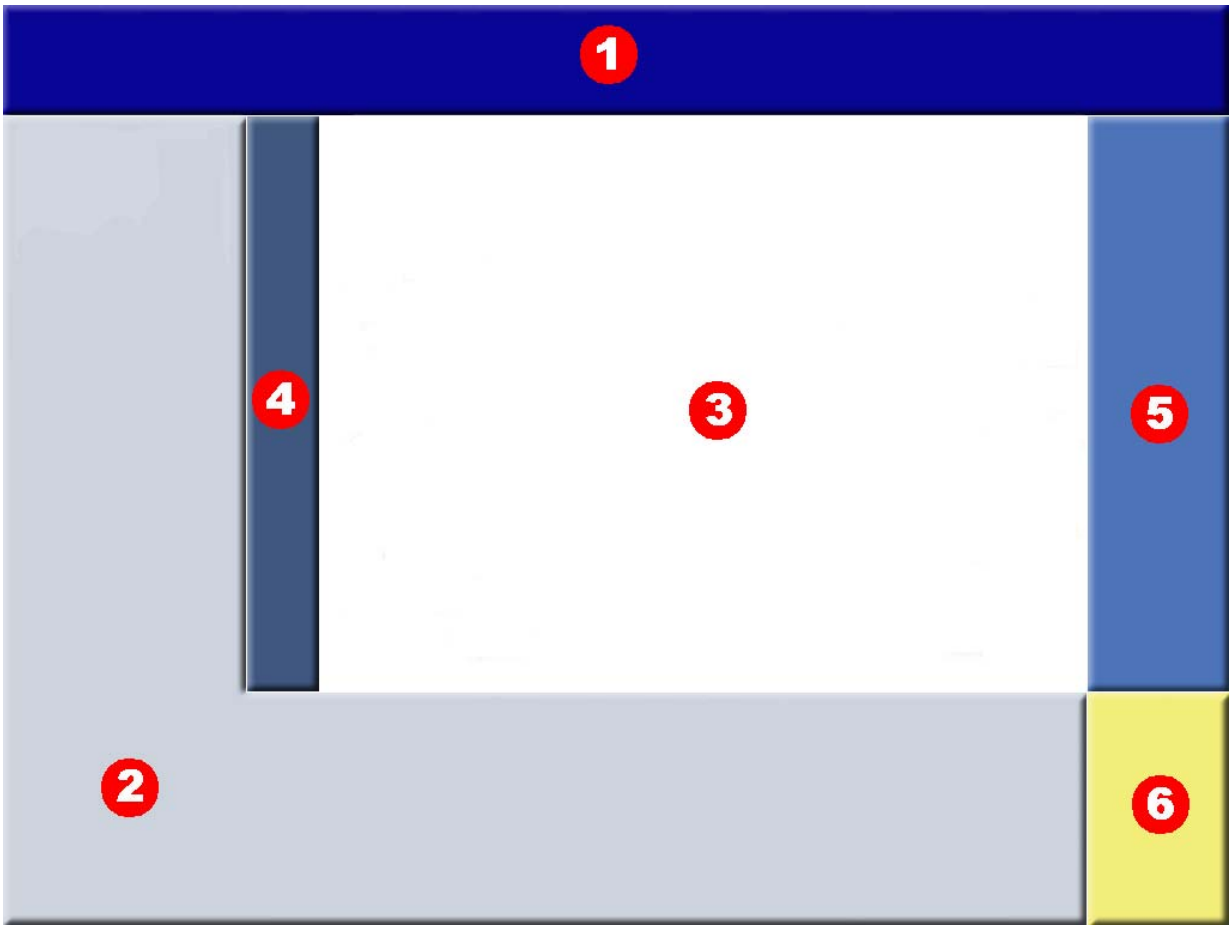
PC✕: FLAT version

The use of **TE✕** programme mainly consists of a graphic coloured screen, sensitive to the touch ("touch screen") allowing the operator to interact with the control system of the machine by simply touching the push-buttons and virtual objects represented on the screen.
For example: to change the type of current visualization , to set a working setpoint and manual controls, to select the working mode (automatic/manual), to activate a dyeing programme, to change the step in execution, etc.

> Subdivision of the working areas on the Touch Screen

The active area of the touch screen is divided into 6 distinct parts, easily recognizable.
Each area is reserved for particular functions.

Area 1 ➢ system information
Area 2 ➢ manual controls and general information
Area 3 ➢ specific visualizations
Area 4 ➢ choice of specific visualizations
Area 5 ➢ options of specific visualizations
Area 6 ➢ system set-up



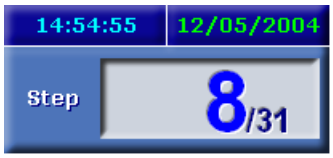
Area 1 of the screen is the only area not sensitive to touch.

> Area 1 ➢ system information

This area of the screen is not sensitive to touch. It is reserved to have always visible, in any operative condition, some characteristic information about the status of the control system and of the controlled machine.

In this part of the screen following data are displayed:

- current time of the system
- current date of the system
- number of the step in execution
- total number of the steps foreseen by the programme selected or in execution



- name of the selected dyeing programme or programme in execution
- name of the selected plan or plan in execution
- identification numbers of active functions
- description of anomalies and messages for the operator
- present working mode of the controller (automatic/manual)
- present working mode of the machine (single/master/slave)
- flashing red led, indicating an active alarm
- flashing red led, indicating the request of intervention by the operator
- flashing red led, indicating the active communication with the supervisor system
- flashing green led, indicating the active communication with PLC.

- logo of **TEx** software
- present version of the installed software.

> Area 2 ➢ manual controls and general information

This area of the screen is sensitive to touch and it is reserved to allow the management of manual controls and visualization of general pieces of information, which are advisable to have clearly visible, independently from current operative conditions of the controller and of the machine controlled.

This area of the screen is pre-programmed by the manufactured of the dyeing machine; it may therefore have different layout according ding to relevant application and to the type of the machine controlled.

In this part of the screen following virtual objects can be displayed:

- 3-way selectors (1-0-2), lighted and not-lighted, big and small, of various colours.

Selector OFF on position 0

Selector OFF on position 1

Selector OFF on position 2

Selector ON on position 2

To select a control, just to touch the screen on the numerical nameplate indicating the position of the virtual selector.

- 2-way selectors (0-1), lighted and not-lighted, big and small, of various colours.

Selector OFF on position 0

Selector OFF on position 1

Selector ON on position 1

To select a control, just to touch the screen on the numerical nameplate indicating the position of the virtual selector.

- push-buttons, lighted and not-lighted, big and small, of various colours.

Push-button OFF not-pressed

Push-button OFF pressed

Push-button ON not-pressed

Push-button ON pressed

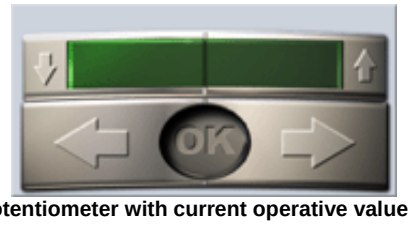
To press a push-button, just touch the screen in the centre of the push-button.

- lamps and pilot-lamps, flashing and not, big and small, of various colours

Lamp
OFF

Lamp
ON

- potentiometers and devices to set values and set-points.



Potentiometer with current operative value

Potentiometer with modified value, to be confirmed

Potentiometer activated to increase current value

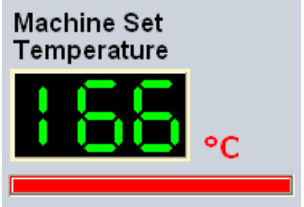
Potentiometer activated to decreased current value

Potentiometer activated to set maximum value

Potentiometer activated to set minimum value

To increase or decrease current operative value, just touch the keys with arrow on the right or on the left respectively, on the screen
By touching the keys arrow-upwards or arrow-downwards, it is possible to set maximum and minimum acceptable values respectively.
If the operative value was modified on the potentiometer, the button OK is highlighted. It should be touched for confirmation.
If within 10 seconds from the last modification, the datum is not confirmed by touching the button OK, then the potentiometer will automatically reset and activate the previously used value again.

- numerical indicators for analogue values of various colours, style and size.
- approximate indicators (“bar-graph”) for analogue values, of various colours and size.



> Area 3 ➢ specific visualizations

This area of the screen is sensitive to tough and it is used for preset specific visualisations which can be selected by the operator independently from current operative conditions of the controller and of the machine controlled.

There are totally 8 specific visualisations which can be called back by the operator:

❶ **Synoptic panel and status of the range**
❷ **Programme in execution**
❸ **Active functions**
❹ **Specific manual controls and process data**
❺ **Trend, graphs and historical data**
❻ **Alarms and messages for the operators**
❼ **Machine parameters and accessory functions**
❽ **Acquired images through a digital web-cam (“web cam”)**

Preset specific visualizations can be selected by the operator by using the virtual keys in area 4 of the touch screen.

Preset specific visualisations can be associated to options which the operator can select by using the virtual keys in area 5 of the touch screen.

> Area 4 ➢ choice of specific visualisations

This area of the touch screen is occupied by 8 virtual numerical keys for the selection of 8 prefixed specific visualisations (see chapter 2.3).

The operator can change current choice any time, without provoking any effect or consequence on the control active activity and on the operation of the machine controlled.

The selection active at present is identified by a red coloured number (selection 1 is the one automatically activated by the first start-up of the system).

> Area 5 ➢ options of specific visualisations

This area of the touch screen is occupied by 6 virtual keys which allow the selection of possible options of the specific visualisations.

Every option available is identified by a short alphanumeric description and by a contextual graphic icon.

Virtual keys which do not present alphanumeric descriptions or graphic icons are not used by the programme and can be ignored.

To select an option, just touch the screen in the centre of relevant virtual key.

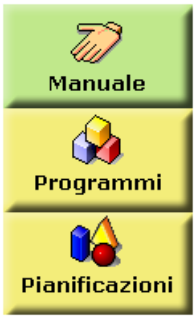
When an option has been selected, its virtual key is represented by a white shade and identified by a functional number on top on the right.

To cancel the selection of an option, just touch its virtual key again.

It may happen that some options are temporarily disconnected (disabled) since they are incompatible with current operative situation of the controller and of the controlled machine (for example: the option of loading of a dyeing programme is automatically disabled whenever there is a programme already in execution). Temporarily not active options are characterised by relevant graphic icon, represented in a low definition monochromatic mode.

> Area 6 ➢ system set-up

This area of the tough screen is occupied by 3 virtual keys always present. They allow the management of some set-up of the control system.



1st KEY is used to set the operation mode of the controller (automatic / manual): Its colour depends on its present status.

2nd KEY allows the management of the collection of dyeing programmed in the memory of the system.

3rd KEY allows the management of the set programmes transmitted from the supervisor, which are in the memory of the system.

To select a key, just touch the screen in the centre of the virtual key.

> Specific visualizations

Without provoking any effect or consequences on active control actions or on the operation of the controlled machine , the operator is completely free to select in any moment one of the 8 specific visualisations or thematic pages.

❶ **Synoptic panel and status of the range**
❷ **Programme in execution**
❸ **Active functions**
❹ **Specific manual controls and process data**
❺ **Trend, graphs and historical data**
❻ **Alarms and messages for the operators**
❼ **Machine parameters and accessory functions**
❽ **Acquired images through a digital web-cam (“web cam”)**

Prefixed specific visualisations can be selected by the operator by using the virtual keys in area 4 of the touch screen.

The specific selected visualisations are displayed in area 3 of the touch screen.

Also the specific visualisations can then present a series of prefixed options for controls or programme concerning the data and displayed information.

For example, the controls to activate, modified or cancel an active function are connected to the specific visualisations of the active functions and are therefore accessible and recallable by the operator by selecting page 3.

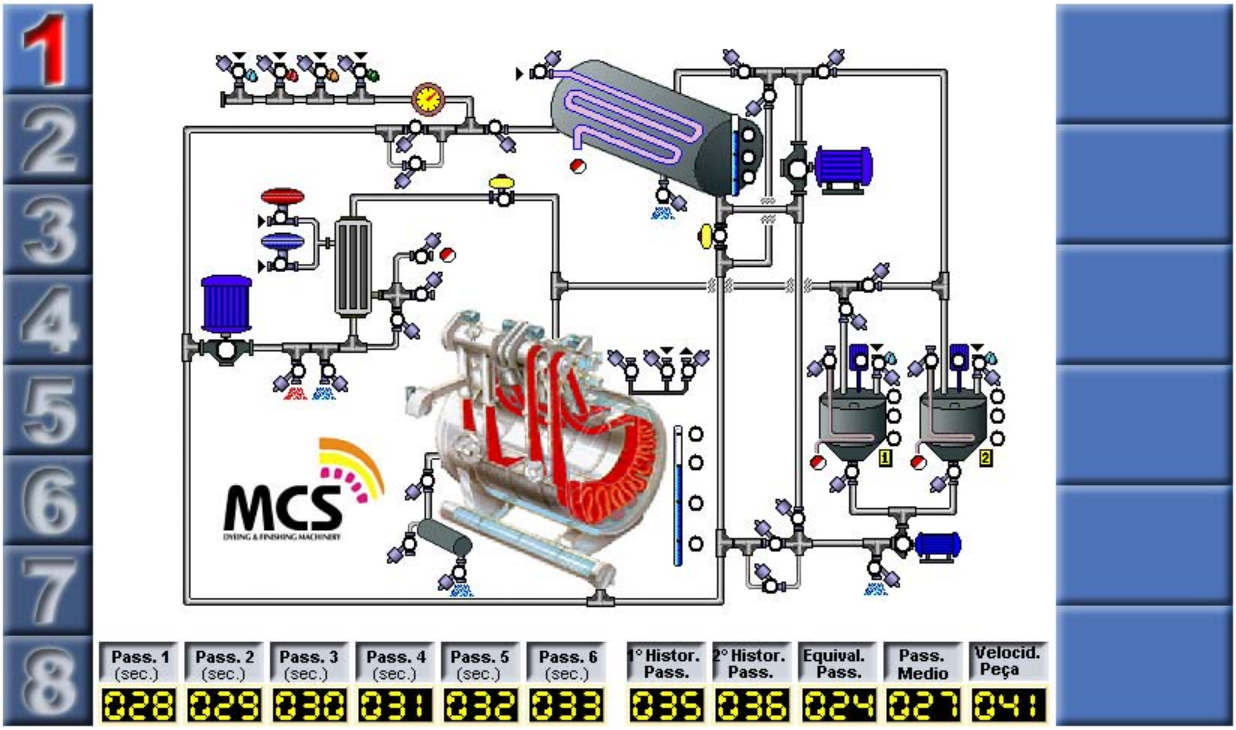
Possible options associated to prefixed specific visualisations can be selected by the operator by using the virtual keys in the area 5 of the touch screen.

In other words, the specific visualisations are the main menu of the applicative programme and the options associated to the specific visualisations are their relevant submenu.

> Synoptic panel and status of the range

The first specific visualisation available is the synoptic panel and the status of the controlled range.

This page is preset by the machine manufacturer and shows all main information for the immediate understanding of the working conditions of the machine and about the status of main components of the machine (valves, pumps, levels, etc.)

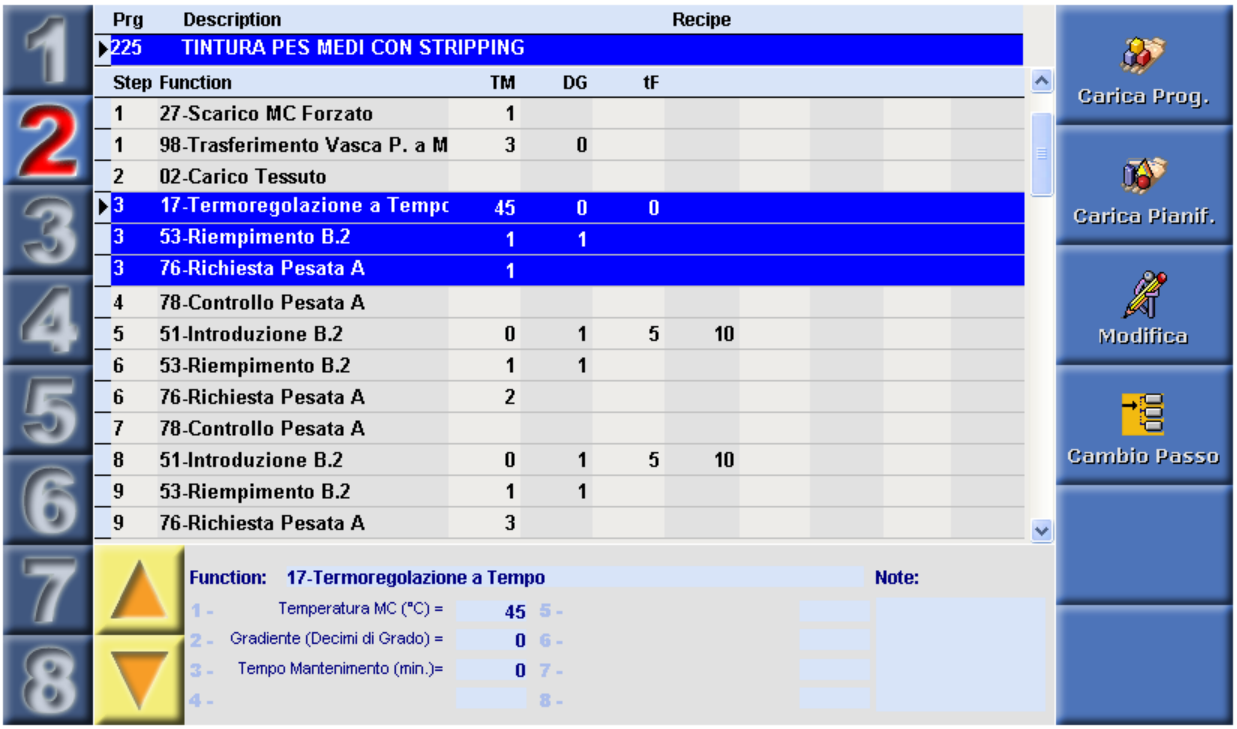


NO options are associated to this page.

> Programme in execution

The 2nd specific visualisation available shows the programme or the automatic dyeing cycle selected or in execution.

This page shows a heading in which you see the Number of the selected programme and its description.
Furthermore also the sequence of the various steps of the dyeing programme are visualised and then, step by step, the number, the description and the parameters of the control function (or functions) programmed in that step.



Current step, in which the programme in execution is, is automatically highlighted by a blue background.

This page shows also a window with information in details and with the parameters of the active function identified by a triangular arrow in the first column.

The big virtual keys with triangular arrows ‘upwards’ and ‘downwards’ allows to change the function, whose detailed information are to be shown in the relevant window.

Following options are associated to this page:

- ❶ **Loading of a dyeing programme** See page 31
- ❷ **Loading of a programme from Supervisor** See page 32
- ❸ **Modification of a programme in execution** See page 33
- ❹ **Change of the step in execution** See page 34

> Active functions

The 3rd specific visualisation available is the one referring to active functions.

This page shows all the control functions currently active. For every function, it visualise: number, description and (if foreseen) also the set value for each operative parameter.

In the first line of the page there are acronyms of the operative parameters referring to the operative function, highlighted by a blue background, obviously only if the function foresees the setting of operative parameters.

The big virtual keys with triangular arrows ‘upwards’ and ‘downwards’ allow to change the function, whose acronyms of relevant operative parameters are to be visualised.

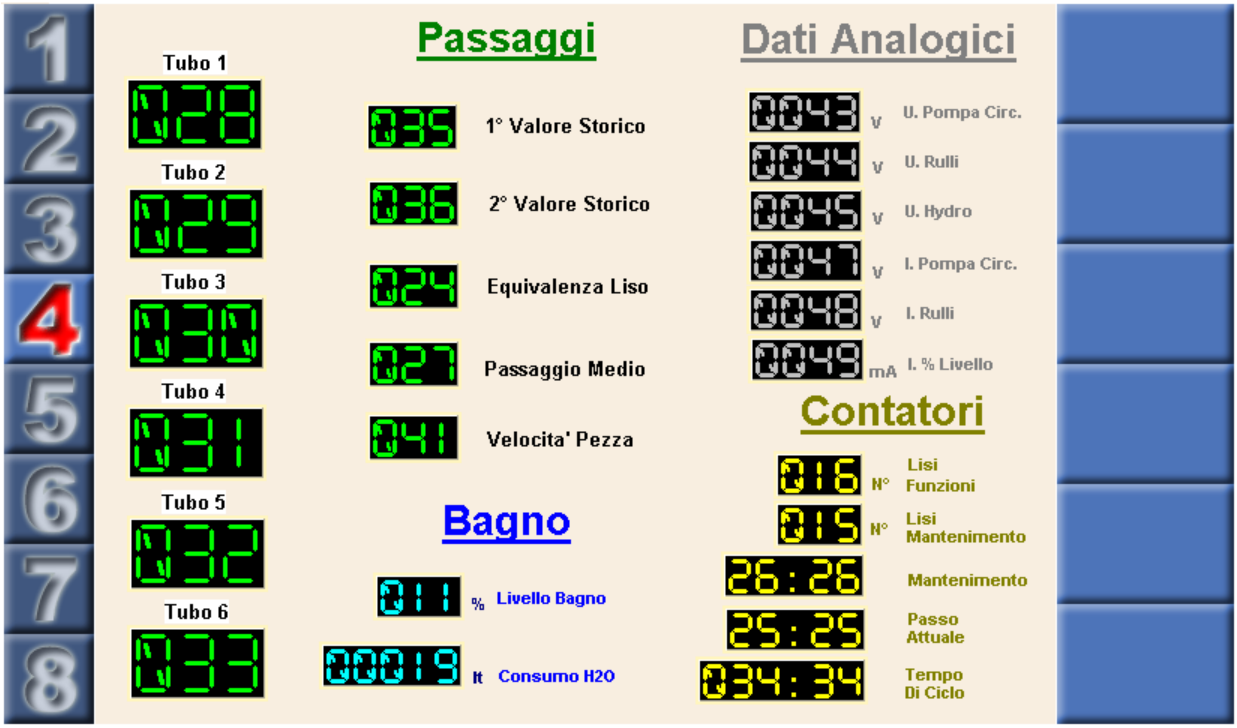
Following options are associated to this page:

❶ **Cancellation of an active function** See page 37
❷ **Activation of a function** See page 35
❸ **Modification of an active function** See page 36

> Specific manual controls and process data

The 4th specific visualisation available is the one referring to possible manual specific controls and process information.

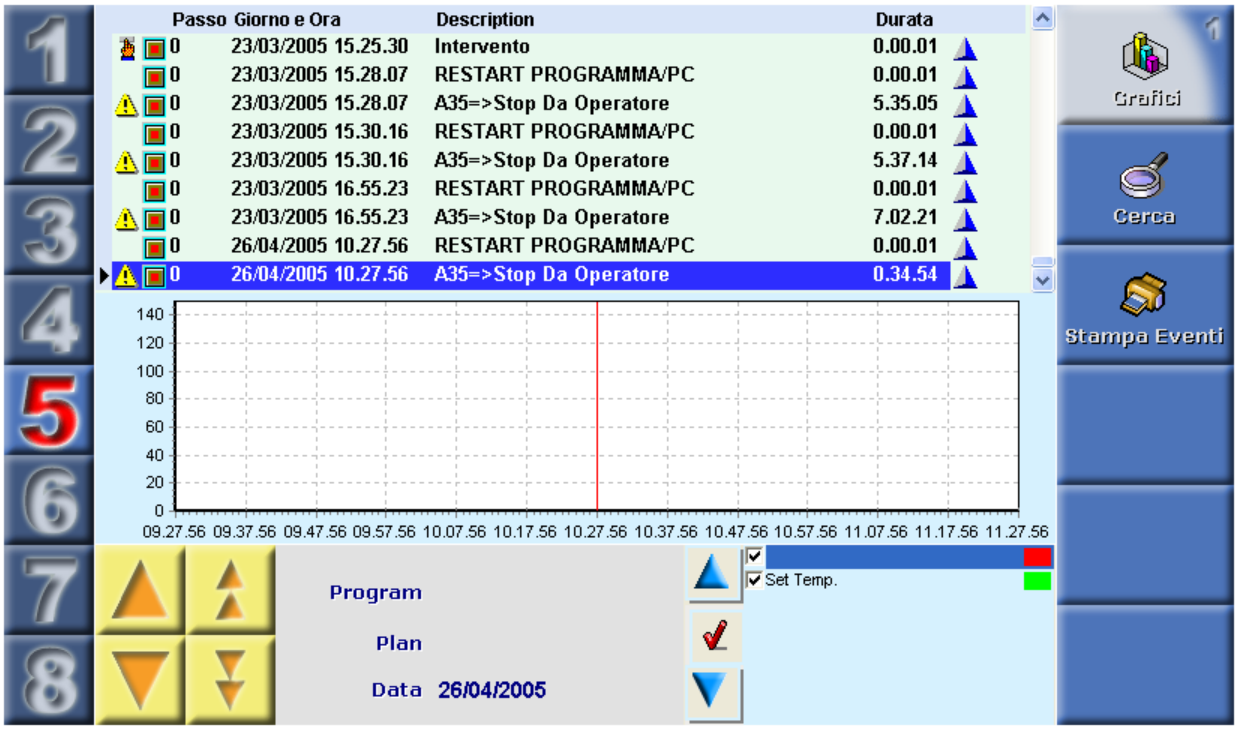
This page is programmed by the machine manufacturer and the process data shown may vary according to the application and type of the machine controlled.



No options are associated to this page.

> Trends, graphs and historical data

The 5th specific visualisation available is the one allowing to know significant historical events stored by the controller (for ex.: alarms occurred) and to visualise in a graph how it is going and variations occurred in a certain period of time referring to some parameters controlled (for ex.: temperature).



The big virtual keys with triangular arrows ‘upwards’ and ‘downwards’ allow to select the previous or following event and therefore to know, by reading the data mentioned in the window next to the keys, the programme, the programme from supervisor and the date the stored event is referring to.

Following options are associated to this page.

❶ **Activation of graph visualisation**
❷ **Event searching**
❸ **Event printing**

The option ‘Event Searching’ allows the filtered visualisation of the historical events according to the programmes or programmes from the supervisor.

The option ‘Event Printing’ can be activated only if a printer is connected with the parallel port of the controller.

> Alarms and messages for the operator

The 6th specific visualisation available is the one reserved to the messages for the operator (alarms, anomalies, simple notices, request for interventions, etc.)

The list of possible situations of alarms and messages for the operator is pre-set by the machine manufacturer and may vary according to the application and the type of the machine controlled.

Some situations of alarm, considered particularly important and significant, are such to activate automatically the visualisation of this page.

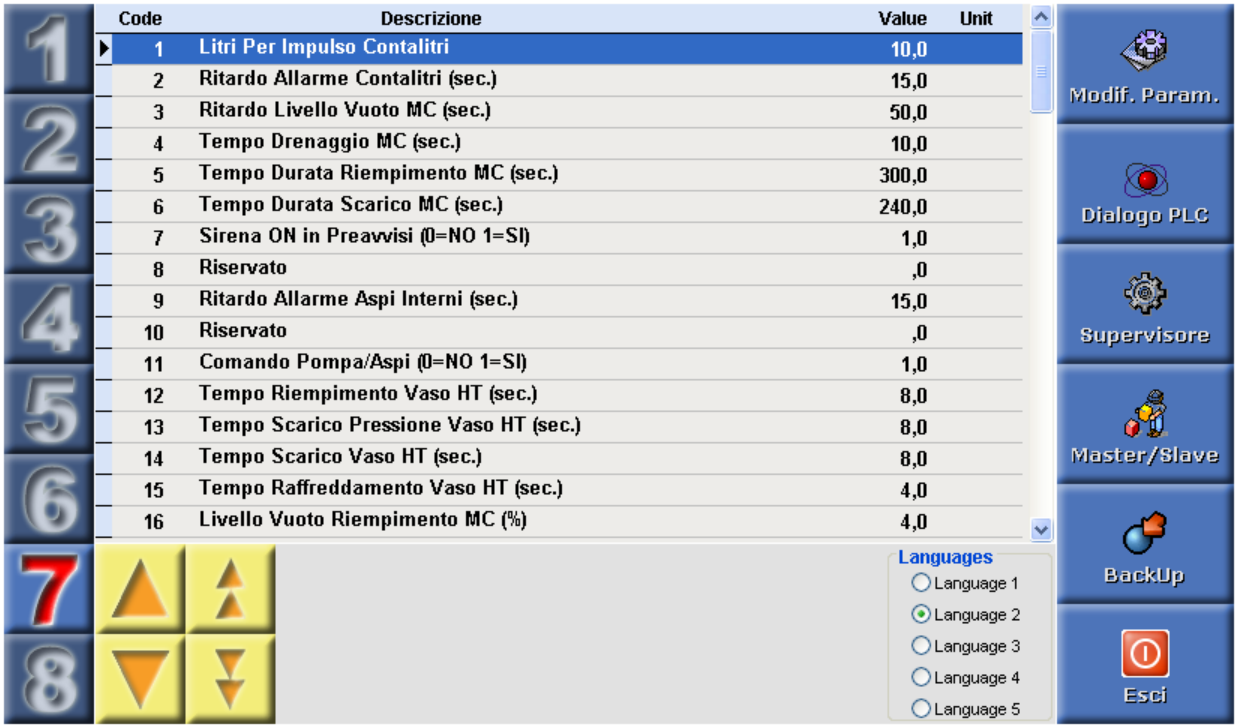
No options are associate to this page.

> Machine parameters and accessory functions

The 7th specific visualisation available is reserved to the visualisation or programme of the so-called fixed parameters of the machine (those parameters which are independent form the specific dyeing programme used). To have access to other accessory functions of the system for maintenance and diagnostics of the controller and not strictly bound to the dyeing process.

The access to this page is subjected to the correct introduction of a password (usually unknown to the dyer), since the modification of some options and settings, here available, may jeopardize the correct and best operation of the machine.

The list of the parameters of the machine is pre-fixed by the machine manufacturer; therefore, it may vary according to the application and the type of machine controlled.



The bottom window on the right visualises the language used at present; The language can simply be changed by touching the desired selection-circle on the screen.

Following options are associated to this page:

1. **Modification of fixed parameters**
2. **Diagnostics and communication programme with PLC**
3. **Diagnostics and communication programme with the Supervisor**
4. **Diagnostics and programme Master/Slave**
5. **Back-Up of data and programmes**
6. **Interruption of the control programme of the dyeing machine**

> Acquired images and digital web-cam (“web cam”)

The last specific visualisation available allows the management in real time of images acquired through a web-cam; the system is pre-set to be connected by means of USB port to an external camera and to visualise the acquired images directly on the screen of the controller.

The use of this function is obviously subjected to the availability of a digital camera to be connected to the controller; therefore, you should get in touch with the machine manufacturer to check possible incompatibility and to have more information about the function itself.

Following options are associated to this option:

1. **Start of visualisation of images**
2. **Image stop**
3. **Search and programme the web-cam connected**