

# Tissue Stainer

# TST 44

## Instruction Manual



**IMPORTANT:** Read this manual before starting the instrument

Rev. 02 (08.2009)

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# Konformitätserklärung

Certificate of Conformity  
Attestation de Conformité



Type of instrument:  
Model:  
Serial No.:

Tissue Stainer  
TST 44

We do hereby certify that the above mentioned product meets the requirements set forth in the CE Guidelines indicated below including all changes and addendums to date thereto. The above mentioned product has been controlled and meets the following standards and guidelines:

<b>EU Directive 2006/42/EEC</b>	<b>Machinery</b>
<b>EU Directive 2004/108/EEC</b>	<b>EMC</b>
<b>EU Directive 2006/95/EEC</b>	<b>Low Voltage</b>
<b>DIN EN ISO 9001</b>	
<b>VDE 701/702</b>	



Burgdorf, 20.05.2008

Michael Ott – Managing Director



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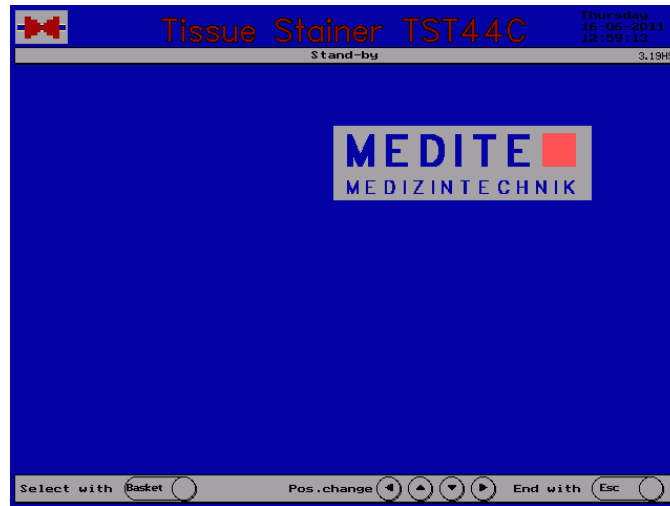
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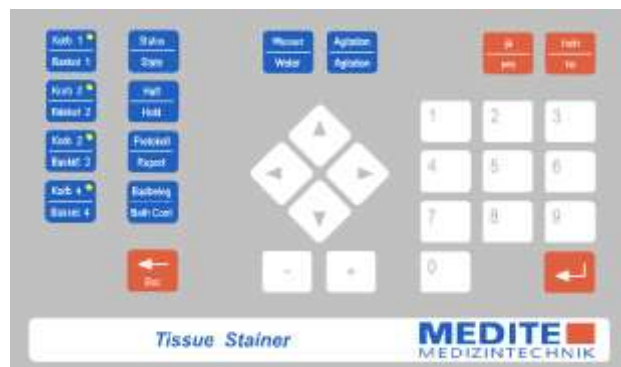
Please read this manual thoroughly. The TST 44 is an easy to handle but complex instrument.

The one or other problem results from not reading these instructions.

- The TST 44 is operated by key pads and controlled on a graphic display. All functions are menu-driven and their use is explained in a pilot line.



graphic display



key pads

- In case you find yourself in a „blind alley“ or decide not to carry out the function: the key **<Esc>** is the „emergency exit“. This key aborts every function.
- The menus are operated by the numeral keys **<0..9>** or the arrow keys and the key **<Input>**. The key **<Esc>** leads back to the previous function.

**Key <Esc>**



**Key <Input>**



**Important: Do not remove or insert the memory card when the instrument is switched on!**



#### Hints:

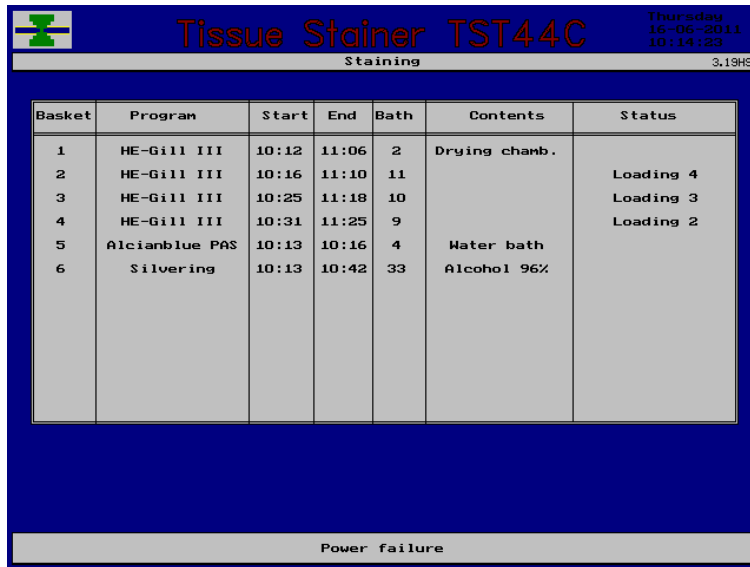
- Never use deformed baskets.  
A damaged basket can stop the staining.
- Fill the baths up to the mark.  
Check the filling level daily.

#### **Water rinsing and agitation**

The water flow stops after the last step requiring water rinsing of all running programmes has been finished. For a short time water supply to the water baths can be activated manually by the button on the front panel.

If the agitation is not needed, it can be switched off at the front panel.

In case of a power failure the display shows the following message:



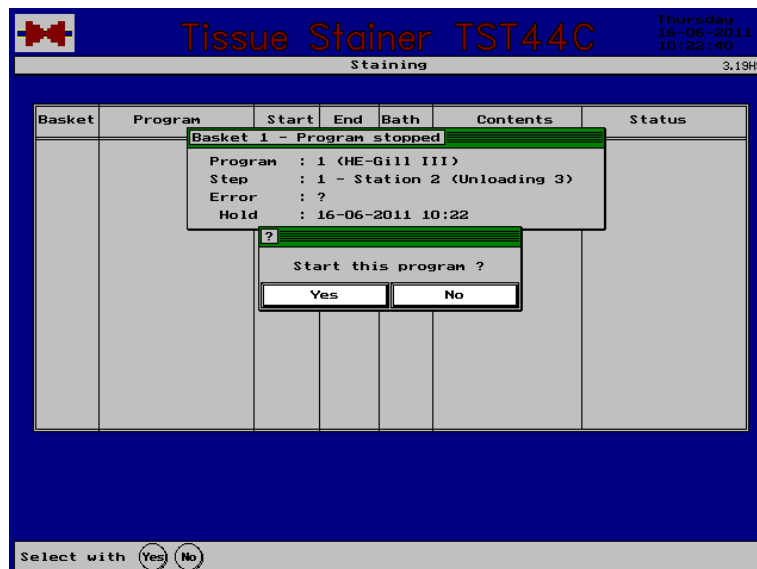
Basket	Program	Start	End	Bath	Contents	Status
1	HE-Gill III	10:12	11:06	2	Drying chamb.	
2	HE-Gill III	10:16	11:10	11		Loading 4
3	HE-Gill III	10:25	11:18	10		Loading 3
4	HE-Gill III	10:31	11:25	9		Loading 2
5	Alcianblue PAS	10:13	10:16	4	Water bath	
6	Silvering	10:13	10:42	33	Alcohol 96%	

Power failure

The operation is continued using the emergency power supply until the battery is empty. If it is fully loaded, operation is maintained for about 20 minutes.

**Note: The agitation and the water rinsing do not work in case of a power failure. It is not possible to start a new program in case of a power failure.**

After restorage of power switch the instrument off and on again to restart. On the display the following question appears:



Basket	Program	Start	End	Bath	Contents	Status
Basket 1 - Program stopped						
Program : 1 (HE-Gill III)						
Step : 1 - Station 2 (Unloading 3)						
Error : ?						
Hold : 16-06-2011 10:22						
?						
Start this program ?						
Yes No						

Select with (Yes) (No)

To confirm and restart the program press the key <Yes>.

Thursday  
15-06-2011  
10:23:15

**Tissue Stainer TST44C**

Staining S/N: 123 3.19HS

31	Eosin														
32	Picric acid														
33	Alcohol 96%														
34	DS 6														
35	Alcohol 96%														
36	EH 50														
37	Alcohol 96%														
38	Alcohol 96%														
39	Alcohol 96%														
40	Alcohol 96%														
41	Alcohol 100%														
42	Alcohol 96%														
43	Alcohol 96%														
44	Alcohol 100%														
45	Alcohol 100%														
16	Xylene														
17	Xylene														
18	Xylene														
19	Xylene														
20	Alcohol 100%														
21	Alcohol 96%														
22	Alcohol 70%														
23	May-Grünwald														
24	Giemsa														
25	Alcohol/Xylin.														
26	Formaline														
27	HTX-6111 III														
28	HTX-6111 III														
29	HCL-Alcohol														
30	Calciumdisulf.														
1	Drying chamb.														
2	Drying chamb.														
3	free														
4	Water bath														
5	Water bath														
6	Water bath														
7	Water bath														
8	Loading 1														
9	Loading 2														
10	Loading 3														
11	Loading 4														
12	Unloading 1														
13	Unloading 2														
14	Unloading 3														
15	Unloading 4														

Press any key to continue

Put the basket in the demanded bath and press any key to continue.

## Hood

When the hood is opened completely, the instrument stops immediately and an alarm sounds until the hood is closed. When the flap (lower part) of the hood is opened, the movement of the mechanism to the first row of baths is blocked, in the middle and last row, the operation is continued.

If, however, the transport arm is in the first row or started a movement to the first row already when the flap is opened the alarm sounds, but the transport is continued.

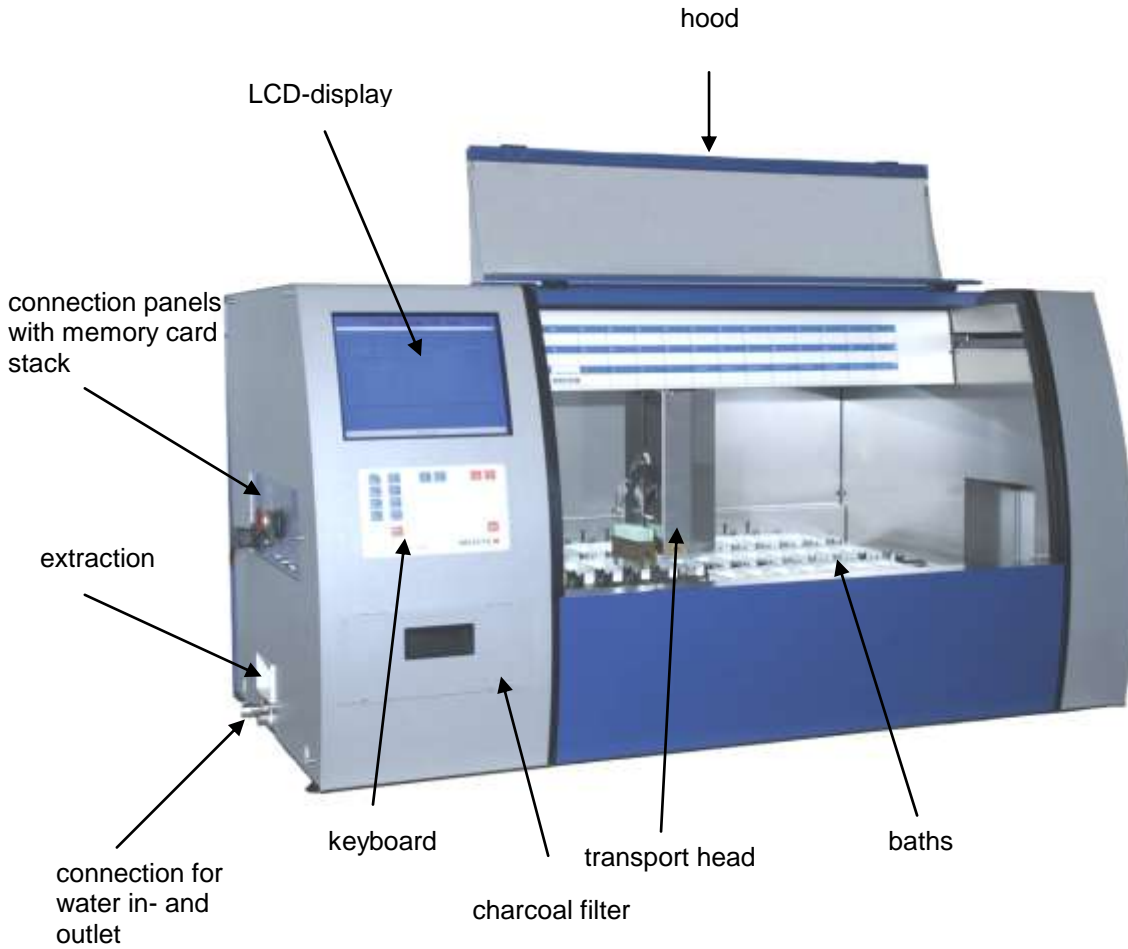
### Note:

The flap should never be left open!

Errors are indicated by the alarm light and an audible signal.

Look at the message on the display and confirm by touching any key.  
Please read the notes in part IV „Errors“ of this manual.

**2.1 Construction**



The baths are arranged as follows:

	Alcohol 70%	Alcohol 96%	06 6	Alcohol 96%	EA 50	Alcohol 70%	Alcohol 96%	Alcohol 96%	Alcohol 100%	Alcohol 100%	Alcohol 100%	Xylene	Xylene	Xylene	Xylene
	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
	Xylene	Xylene	Alcohol 100%	Alcohol 100%	Alcohol 96%	Alcohol 96%	Alcohol 70%	Aqua dest.	Periodic acid	Alcohol 70%	Schiff's reagent	Hemalaun	Hemalaun	Eosin	HCL-Alcohol
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Loading 1	Loading 2	Loading 3	Loading 4	Unloading 1	Unloading 2	Unloading 3	Unloading 4	Water bath	Water bath	Water bath	Water bath	free	Water bath	Water bath
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	↑	↑	↑	↑	↓	↓	↓	↓							





The keyboard shows the following areas:

**Start 1, 2, 3, 4**  
Start of staining for basket 1 to 12

**Arrow keys**  
Input of numerical values and selection of menu points

**YES / NO**  
Confirmation or cancelling of safety requests

**State**  
Indication of program

**Hold**  
Interruption of program

**Report**  
Printing of a report at the end of a staining cycle

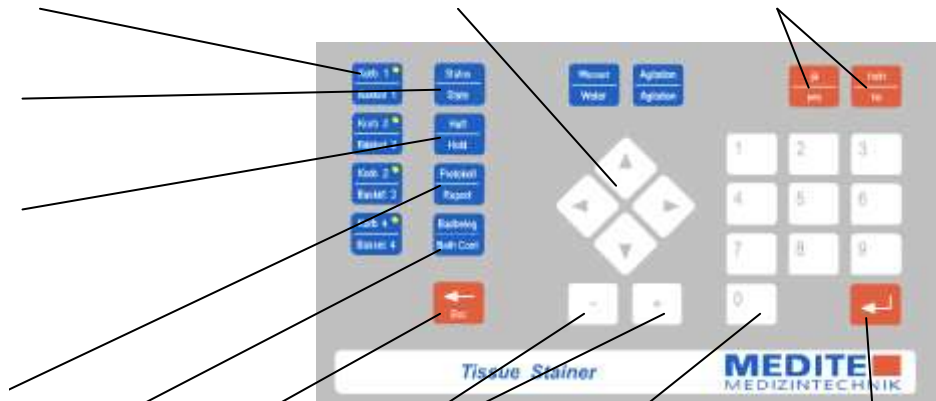
**Bath contents**  
Indication of bath contents

**Escape**  
Abortion or finishing of a function

**+ / -**  
Reduction or increase of a value

**Numerical keys**  
Input of numerical values and selection of menu points

**Input**  
Confirmation of an indicated value or date



**Note:**

At the lower end of the display there is a pilot line showing the necessary keys for the actual operation.

If there is the indication „Please wait“ input is not possible.

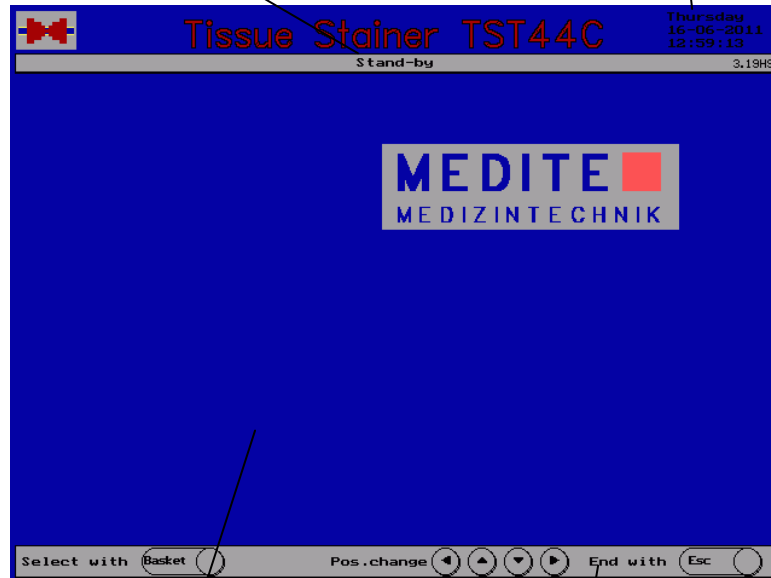


The display is divided into the following areas:

**Head line**

Indication of the actual status

**Time and date**



**Operation screen**

Indication of menus, selection windows and status information

**Pilot line**

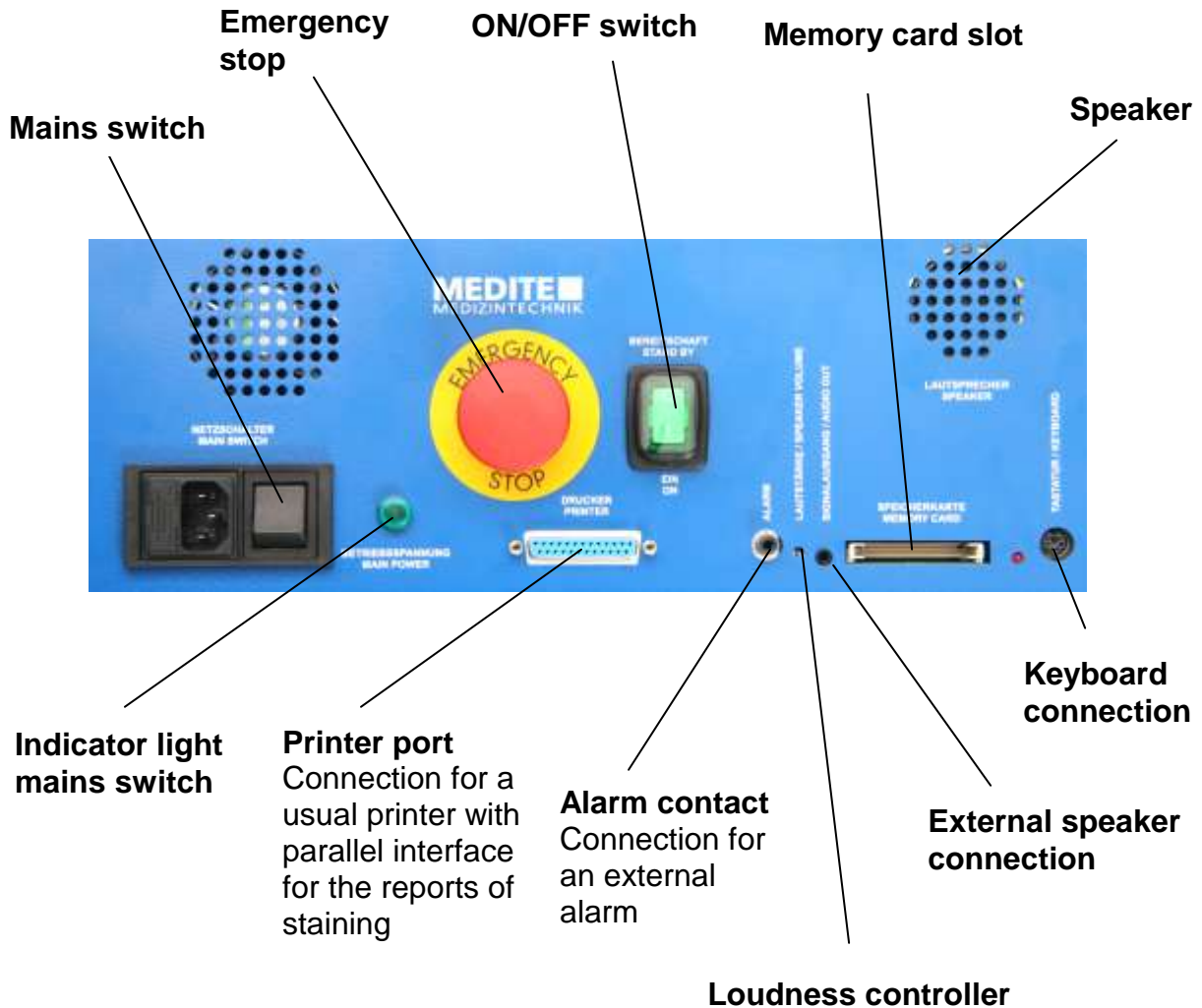
Showing the required keys for the actual operation

**Note:**

The display shows only the indications needed for the actual operation.

The indication of time and date should correspond to the local time. It can be modified using system set-up.

The connection panel is divided into the following areas:



**Note:**

The power indicator lights up when the mains switch is on and the instrument is connected to mains, independent of the position of the On/Off switch.

The switch being in position „0“ the instrument only has the following function:

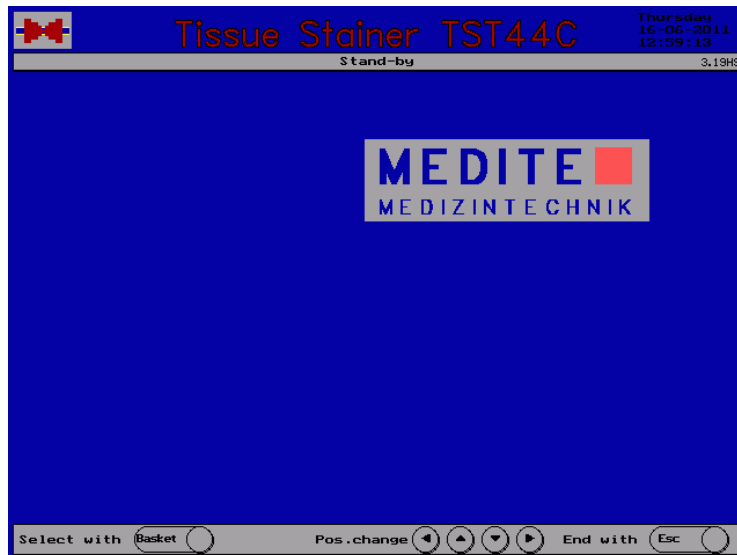
-recharge of the battery for emergency power supply.

## 3 Operation

### 3.1 Menu structure

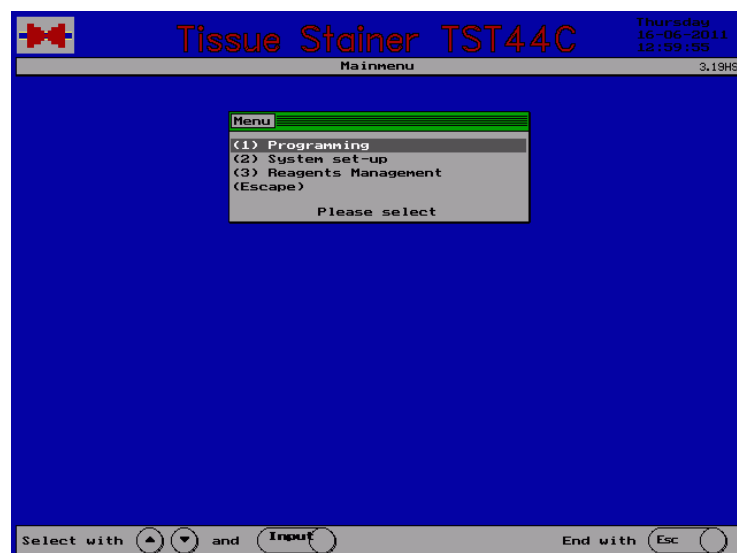
After switching on the instrument as well as after finishing the operation the medite logo and the indication „Stand-by“ appear.

From this status all functions are started.



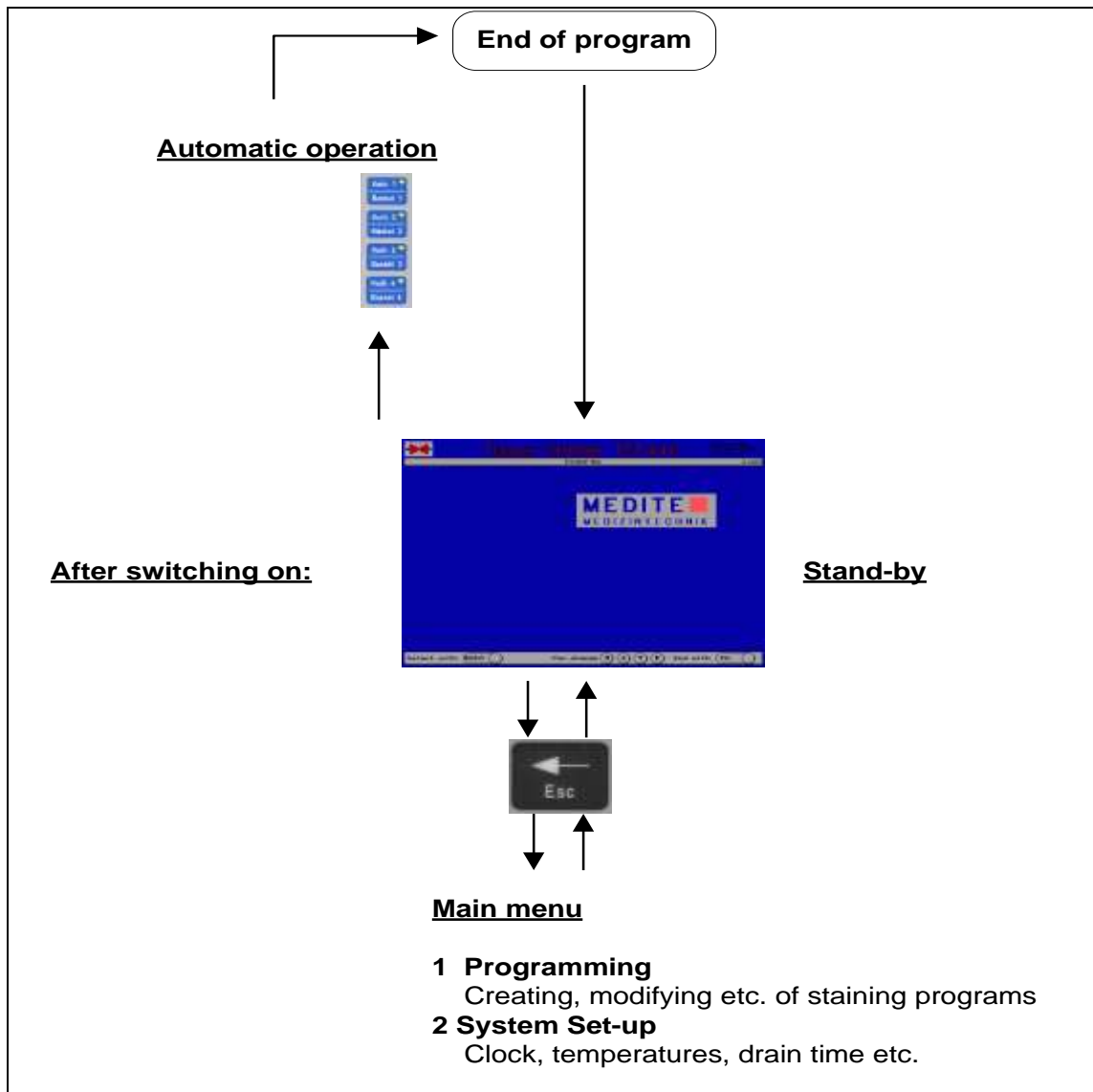
All functions not directly relating to the staining are combined in the „Main menu“.

In the stand-by status press **<Esc>** to have access to the main menu.



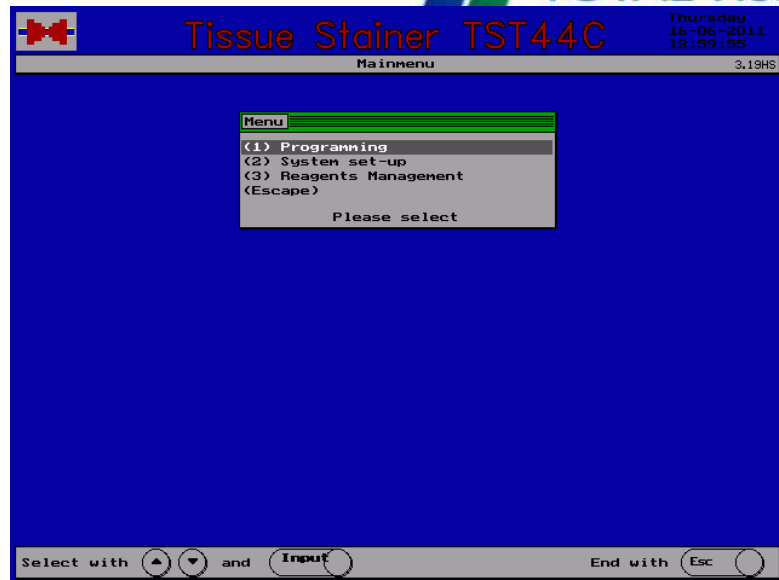
The main menu is divided into programming and system set-up. The key **<Esc>** is used to return to the stand-by status.

user panel:

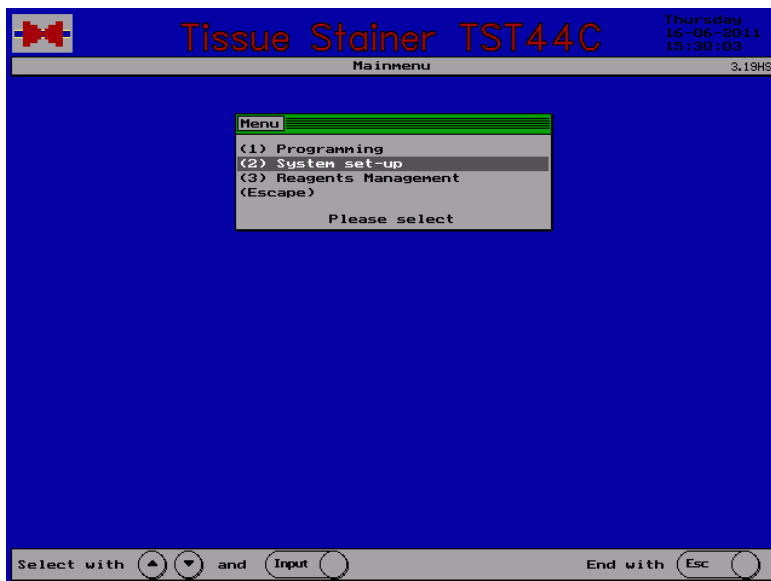


### 3.2 System Set-up

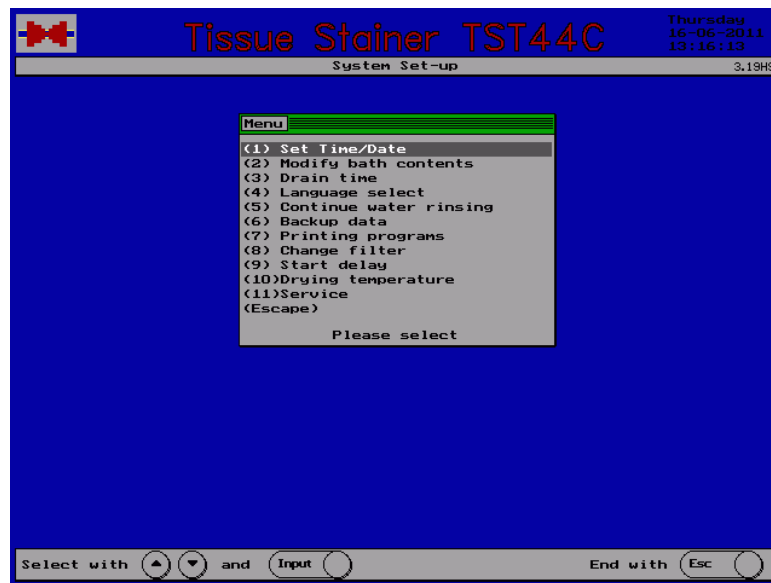
Press the key <Esc> to return from stand-by to the main menu.



Select point 2 of the main menu to display the menu „System set-up“.



basic adjustments to be made by the user.

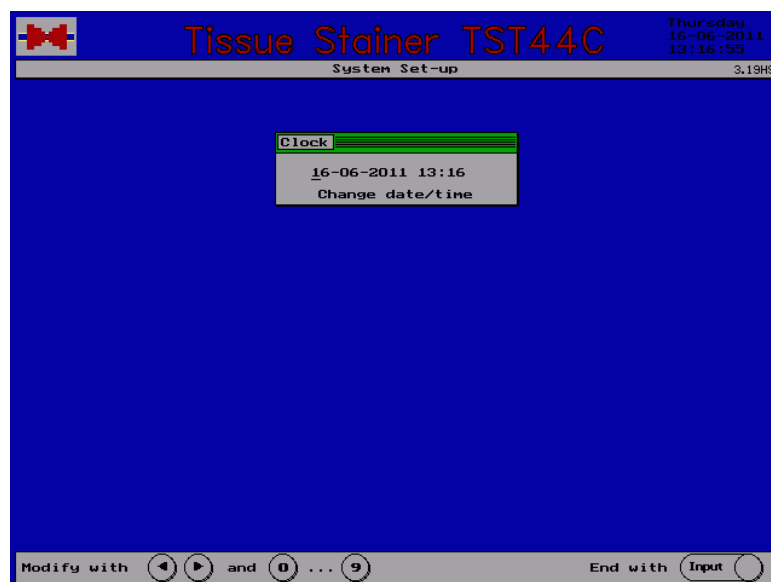


The key <Esc> is pressed to return to the main menu.

### 3.2.1 Set time and date

Select point 1 of the menu „System Set-up“: Set Time / Date

The window for the system clock appears on the display.

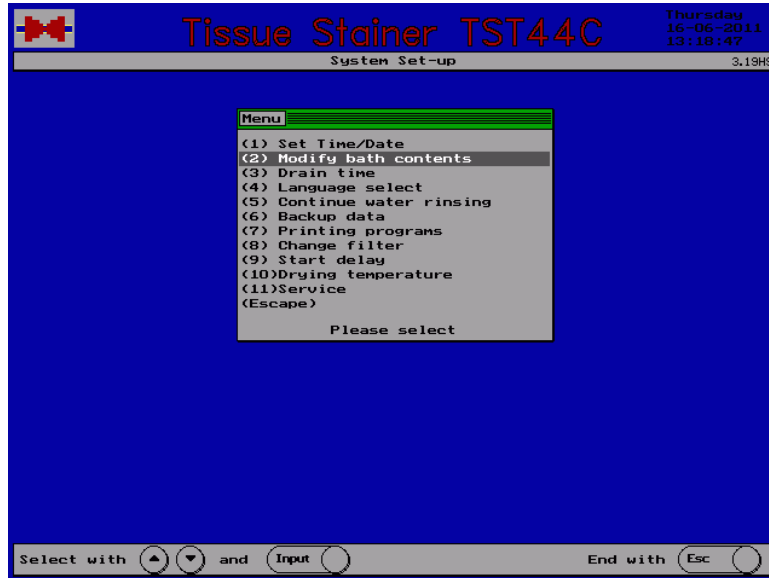


Use the numerical keys to set the date and time. After every input the indicator goes to the next position. The individual positions can be selected by the arrow keys left/right.

### 3.2.2 Modify bath contents

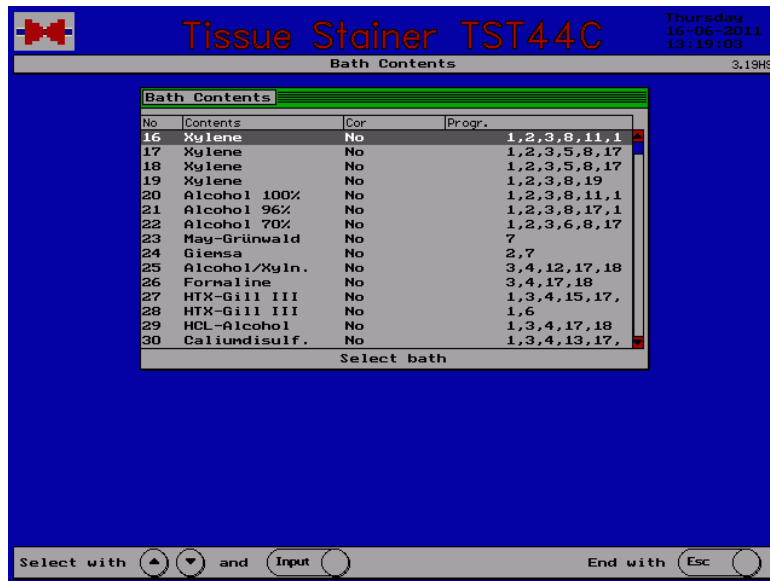
#### contents

Select point 2 of the menu „System Set-up“:  
Modify bath contents.



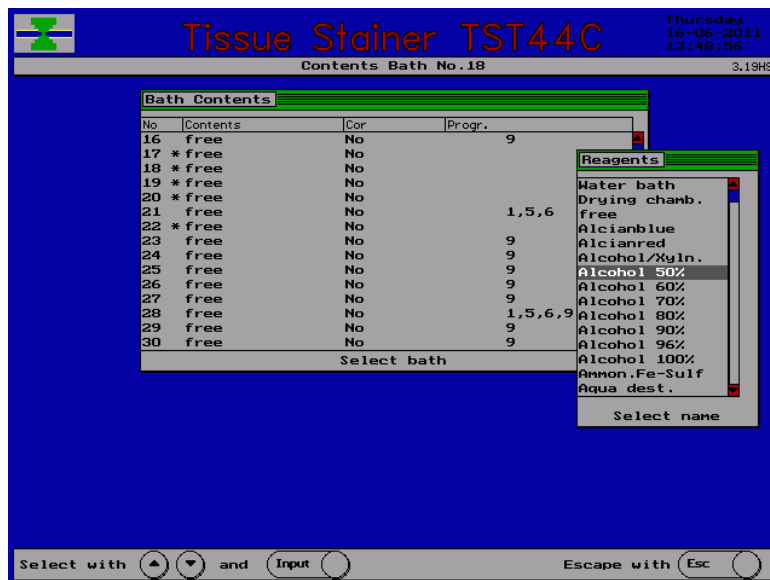


indicated.



Use the arrow keys to select the bath in question and press **<Input>** .

A second list appears showing the reagent selection.



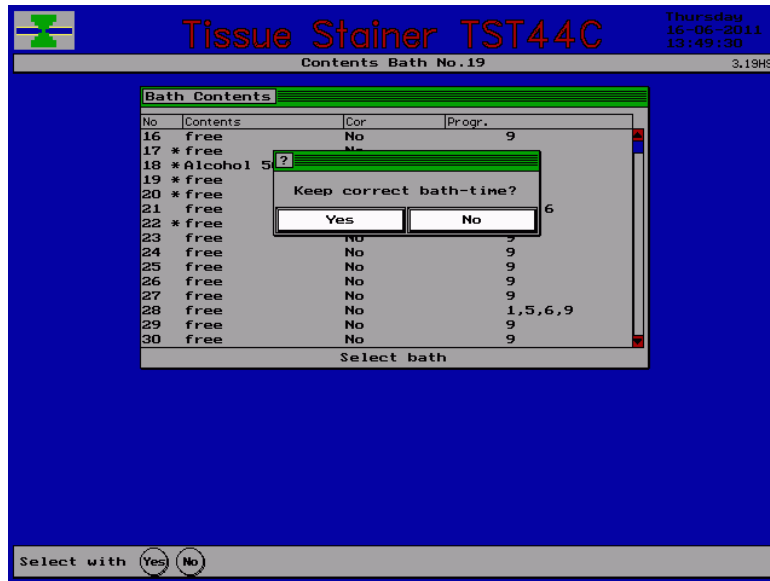
Use the arrow keys to select the requested reagent and press **<Input>** .



In the next column „corr.“  
You can determine



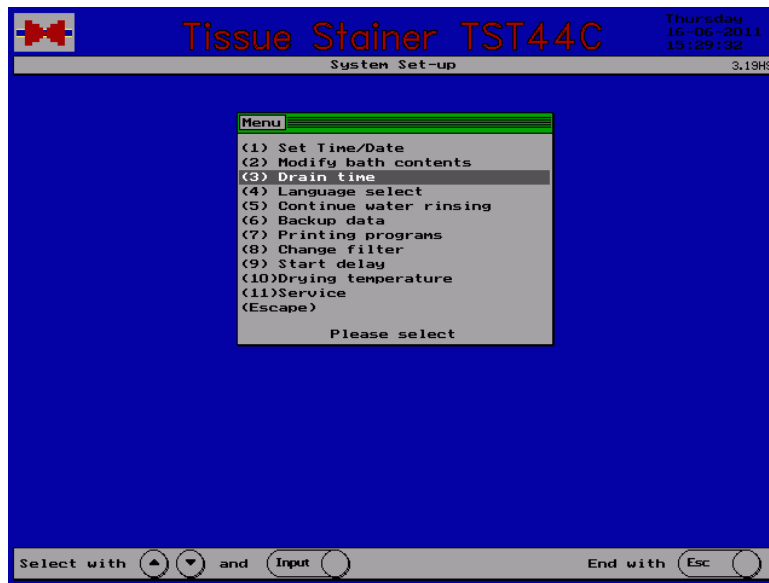
whether the immersion time in this reagent has to be kept exactly **<Yes>** or whether it may vary **<No>** .



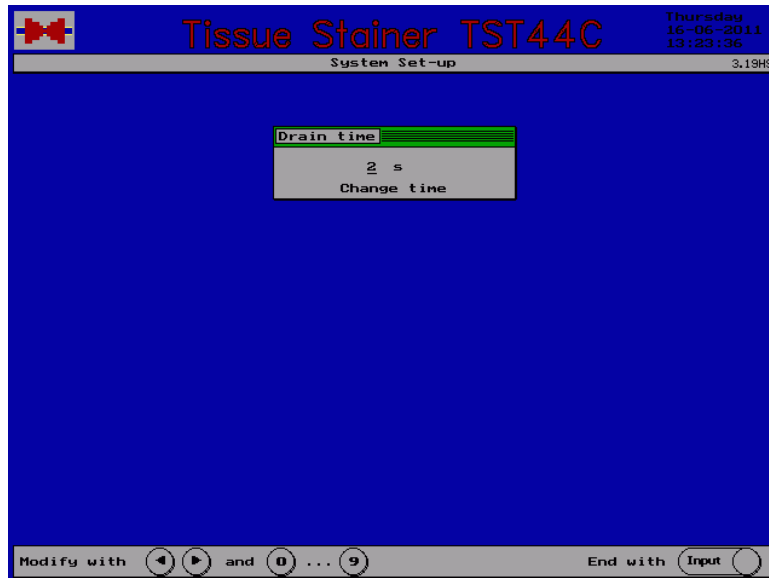
To finish the programming and store the modifications press **<Esc>** .



Select point 3 of the menu „System Set-up“:  
Drain time



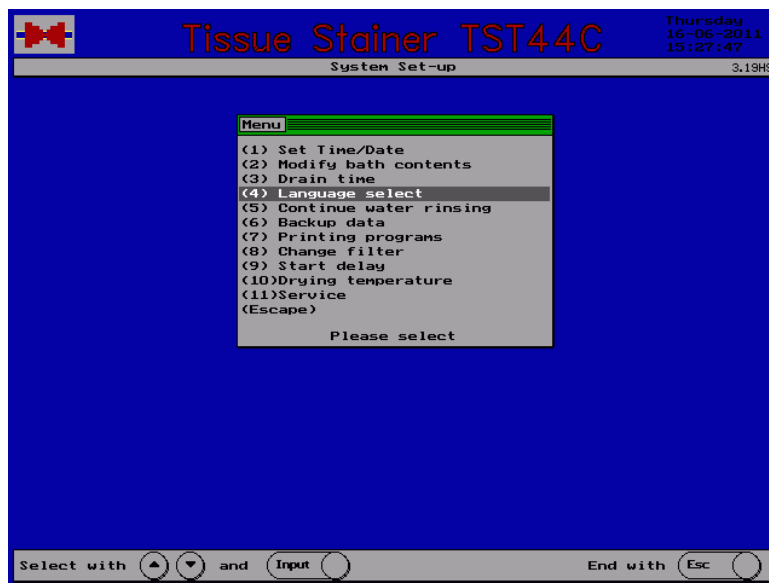
The window for the drain time appears on the display.



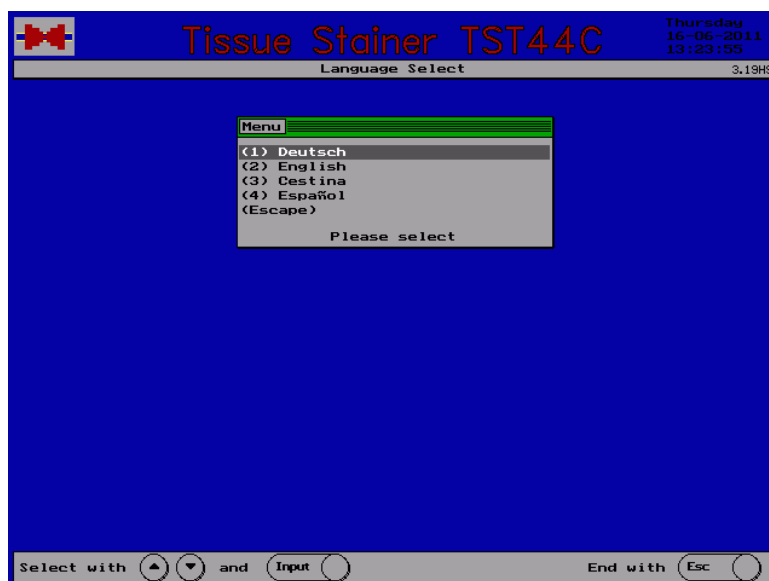
Use the numerical keys to set the required drain time (0s - 9s).  
The set-up is finished by pressing the key **<Input>**.



Select point 4 of the menu „System Set-up“:  
Language select.



The menu „Language select“ appears on the display where the preferred language for the indications can be chosen.

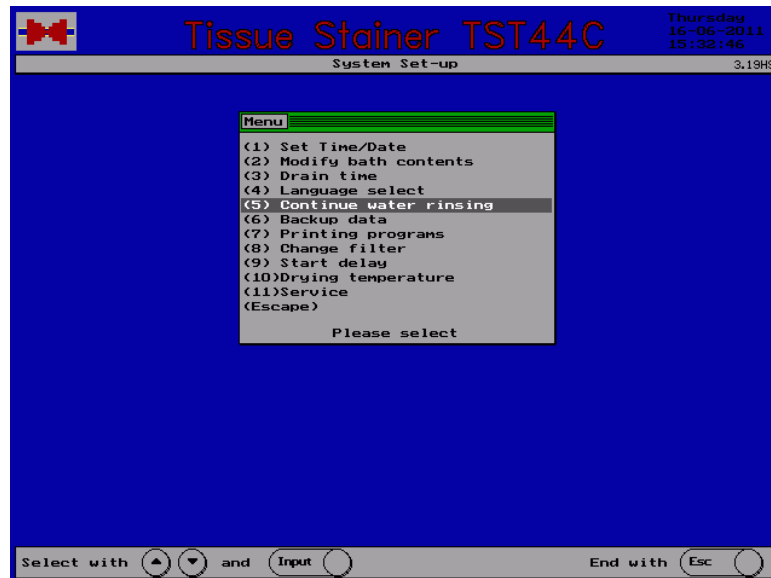


The menu „Language select“ determines the language for all textes indicated on the display.

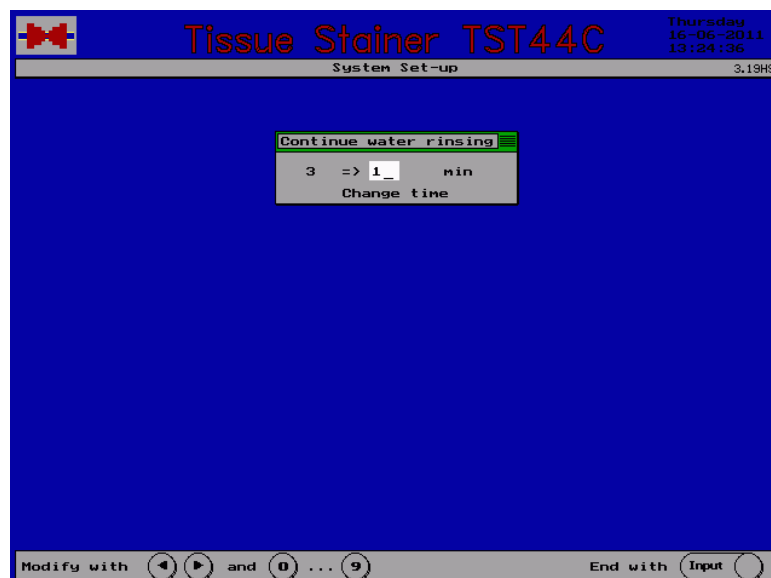
Use the numerical keys for your choice.

The Stainer TST 44 is equipped with a technology for water saving. The water flow is stopped automatically after the last step requiring water rinsing of all running programs has been finished. In case of need (f.ex. for cleaning), an additional period between 1 and 99 minutes can be adjusted, during which the water rinsing is continued.

Select point (5): Continue water rinsing and press **<Input>**.



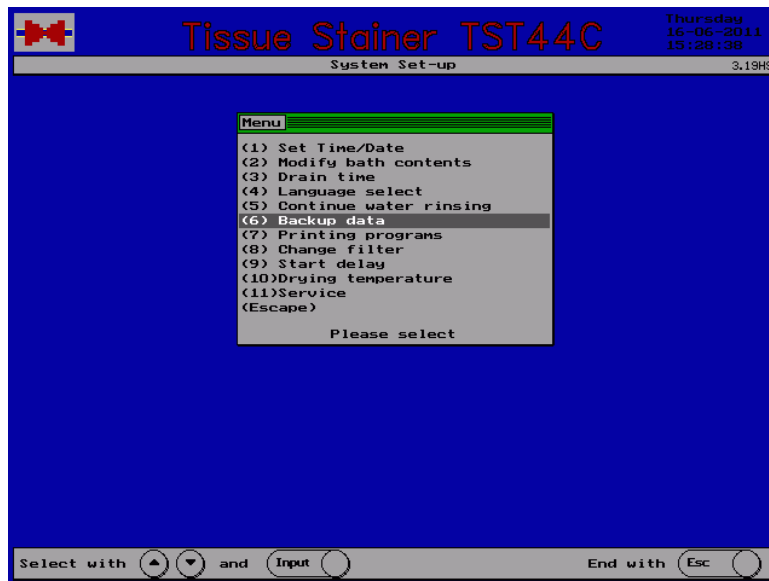
The menu „Continue water rinsing“ appears on the display.



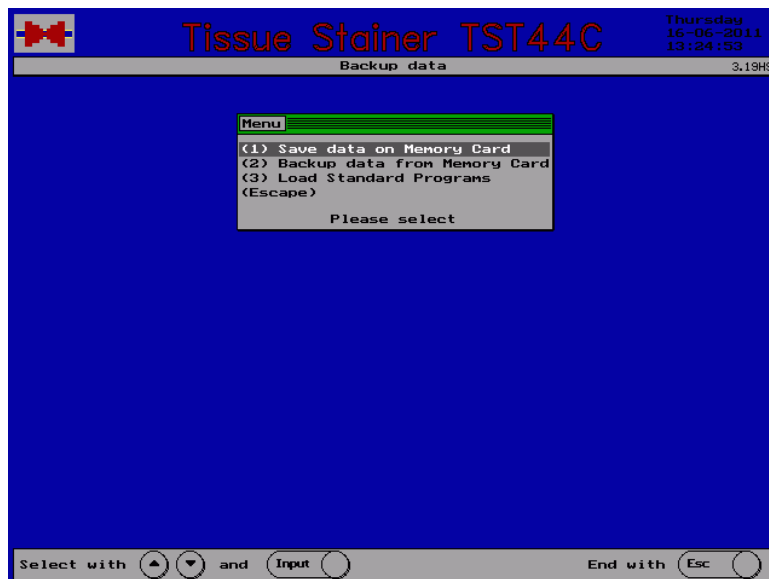
Use the numerical keys for your choice.



Select point 6 of the menu „System Set-up“:



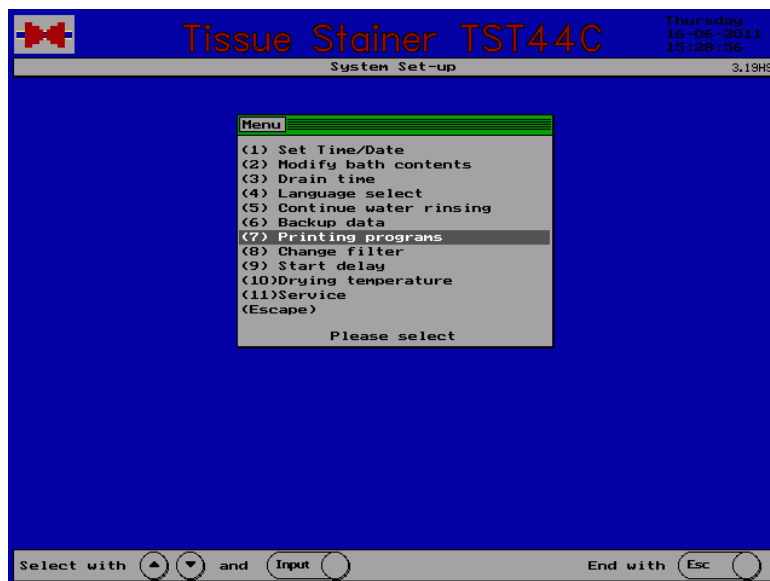
Select typ of backup and press <Input>.



The Backup data menu can copy Backup data: on a CF – Card select point 1, from a CF Card select point 2 or reset all programs select point 3.



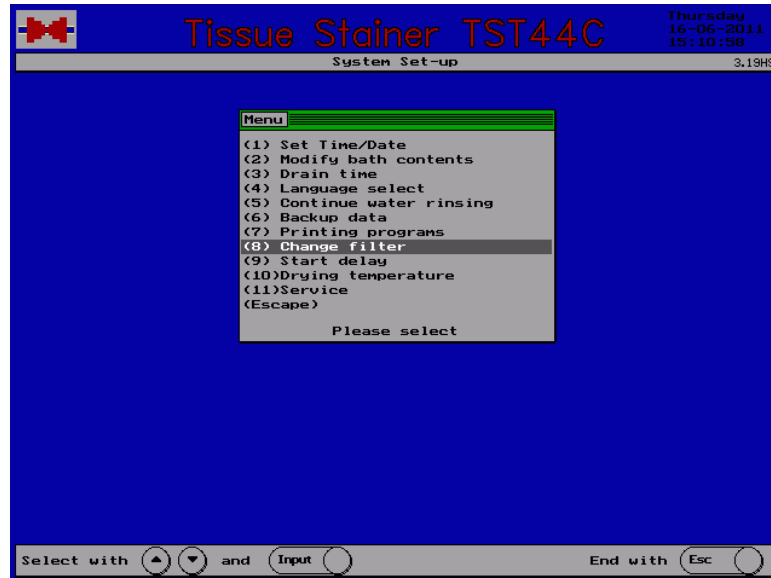
Connect a printer and select point 7 of the menu „System Set-up“  
Printing programs.



All staining programs and the bath contents list are printed.

After 200 operating hours the indication „Change filter“ appears on the display.

Select point 8 of the menu „System Set-up“: Change filter.

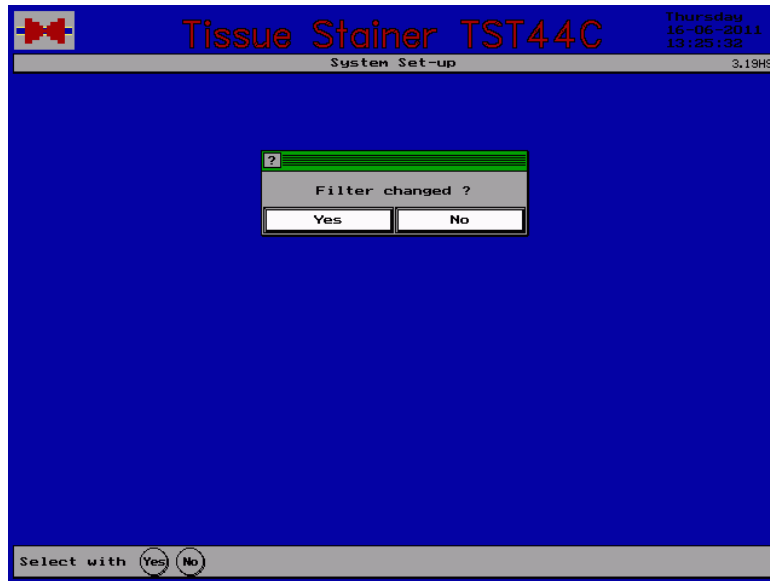




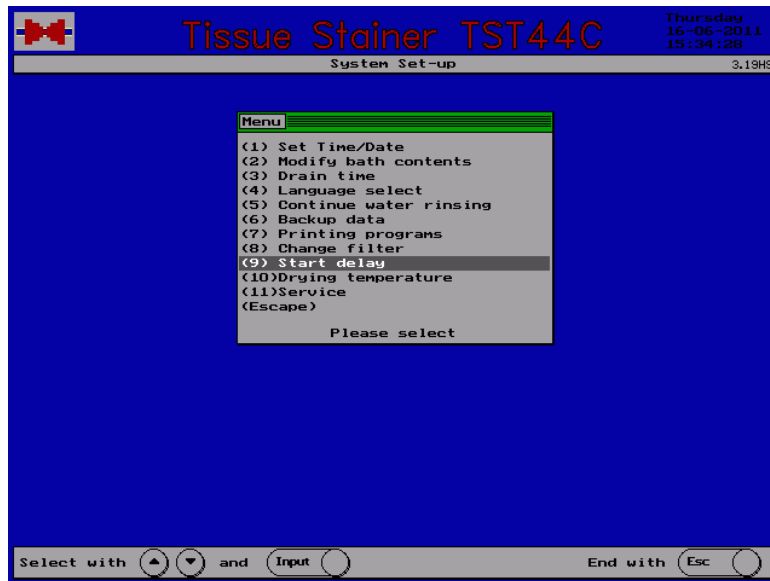


**A.MENARINI**  
diagnostics

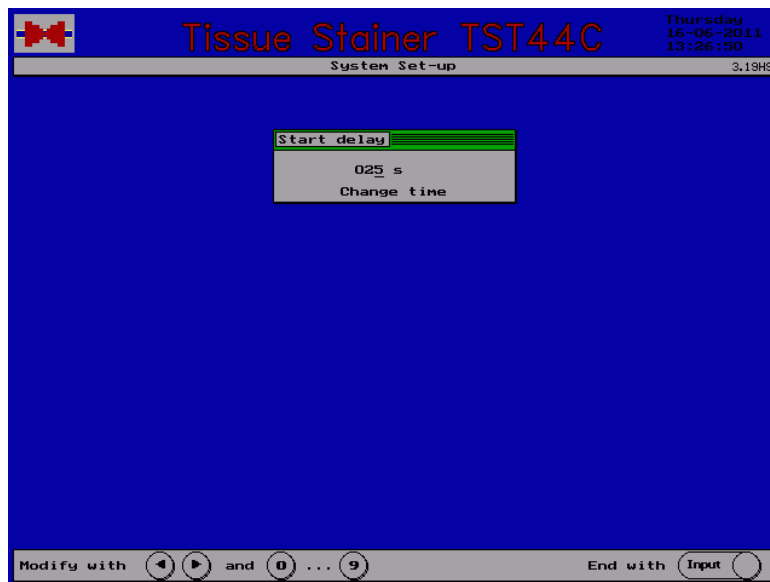
The question „Filter changed ?“ appears,  
which has to be answered by pressing the key <Yes>



You can use the first baths for example for dewaxing. Select point 9 of the menu „System Set-up“: Start delay and press <Input>.



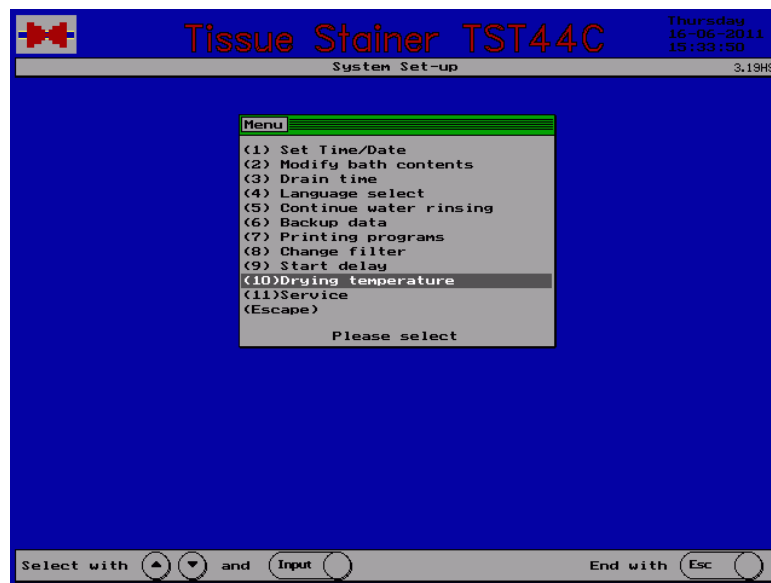
Now you can choose the time in seconds (0s - 600s) during which the baskets should stay in the start position.



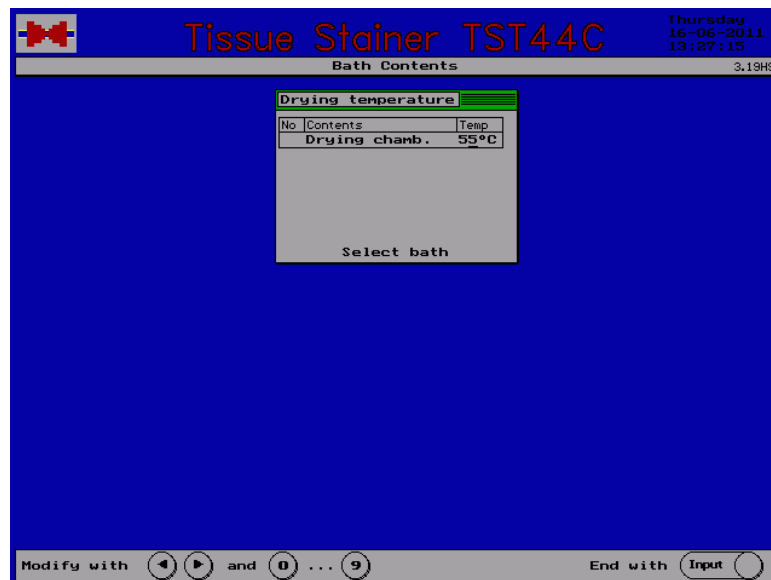
**Note:**  
This delay will be valid for all started programmes!

(optional)

To set the temperature in the two drying chambers select point 5 of the menu „System Set-up“:  
Drying temperature.



The menu „Drying temperature“ appears on the display.



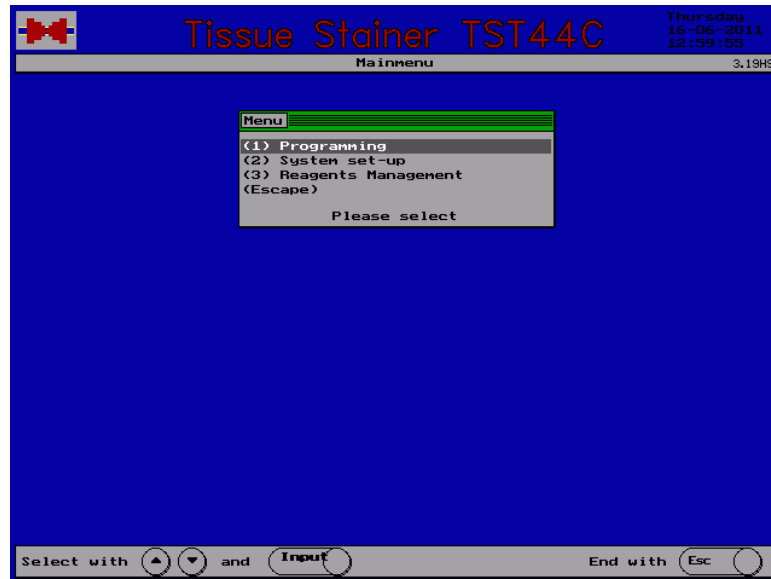
Use the numerical keys to set the required drying temperature.  
It is the same for both chambers.  
The set-up is finished by pressing the key <Input>.

**Attention:**

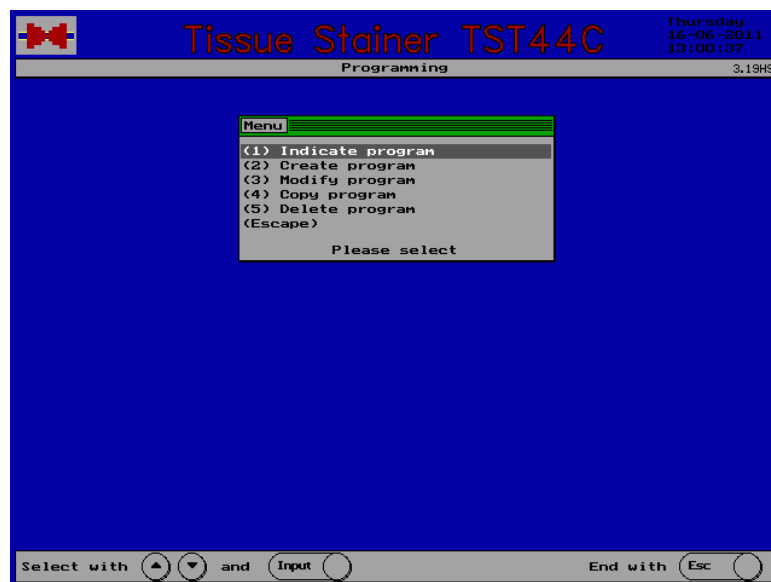
**For safety reasons programs must be created so that a step with an inflammable liquid is never followed by the drying chamber as next step.  
Danger of ignition !**

### 3.3 Programming

Press the key **<Esc>** to return from stand-by to the main menu and select point 1 of the menu:  
Programming.



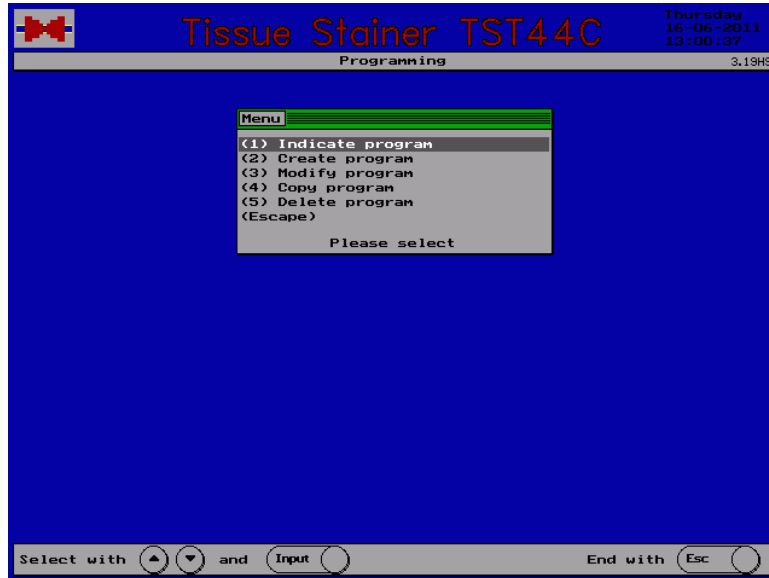
A list of the programming functions appears.



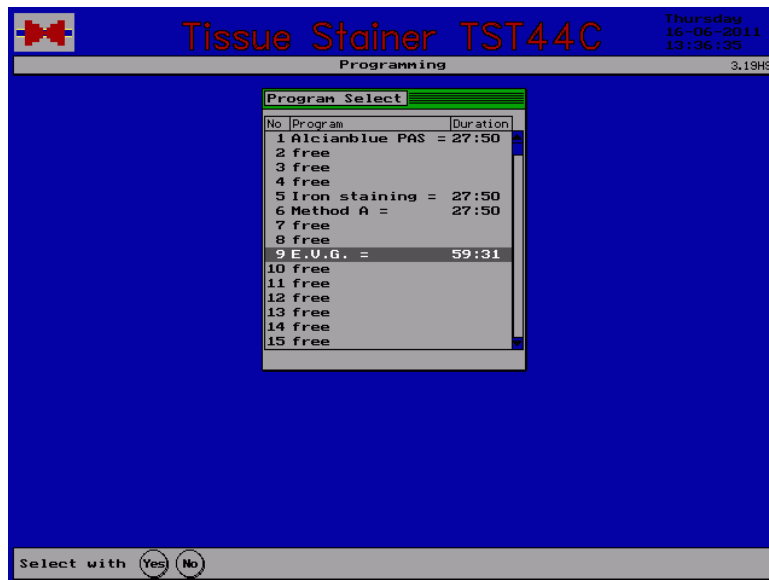
The menu „Programming“ contains all functions relating to the staining methods. Up to 20 different methods with up to 40 steps each can be determined. Use the numerical keys for the required function. Return to main menu by pressing **<Esc>**.

The following pages describe all functions of programming.

Select point 1 of the menu „Programming“:  
Indicate program



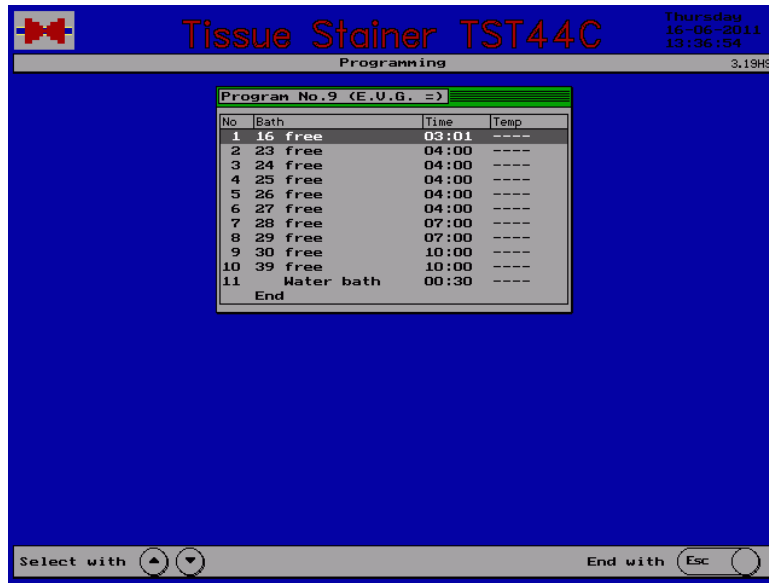
A list of the positions and the existing methods appears.



Use the arrow keys to select the method to be indicated and press **<Input>**.

Empty positions are listed as „free“ and cannot be indicated.

The display shows the selected staining method.



To finish the indication press any key.

### 3.3.2 Create a Program

Select point 2 of the menu „Programming“: Create program.

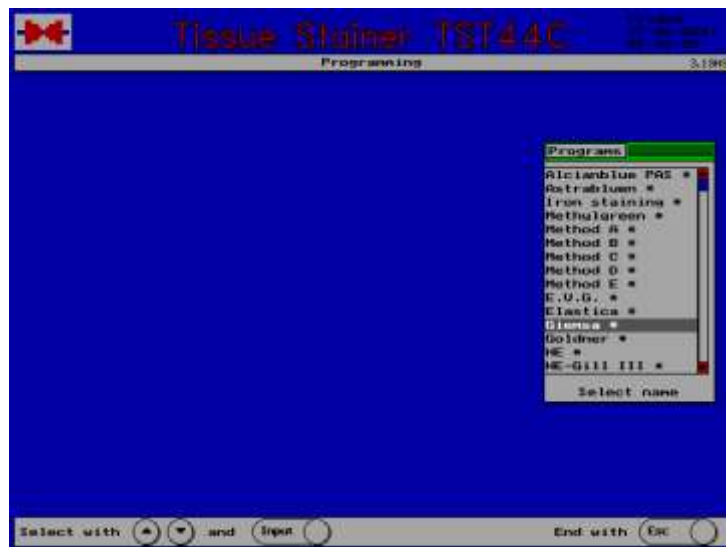


appears.

Use the arrow keys to select a free position and press **<Input>**. Occupied positions may not be chosen.



A list of possible names for the new staining method appears.



Select a name by using the arrow keys or the numerical keys and press **<Input>**.

indicated.



A step comprises the number, the bath to be used and the immersion time. For the drying chamber it contains also the temperature.

**Attention:**

**For safety reasons programs must be created so that a step with an inflammable liquid is never followed by the drying chamber as next step. Danger of ignition !**

Select the bath to be used by the keys **[+]** and **[-]** or by the arrow keys from the list of baths appearing on the display.

Select a column by using the right or left arrow key.

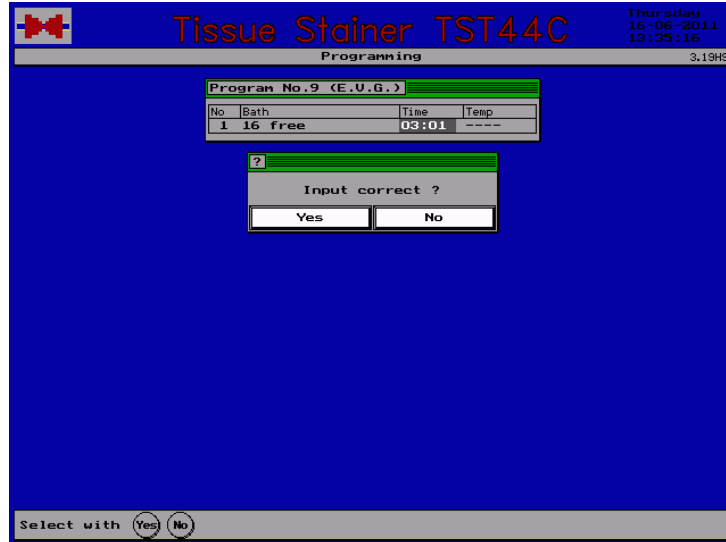
Select the immersion time using the keys **[+]** or **[-]** or the numerical keys 0...9.

Select the temperature of the drying chambers by using the keys **[+]** or **[-]** or the numerical keys **<0...9>**.



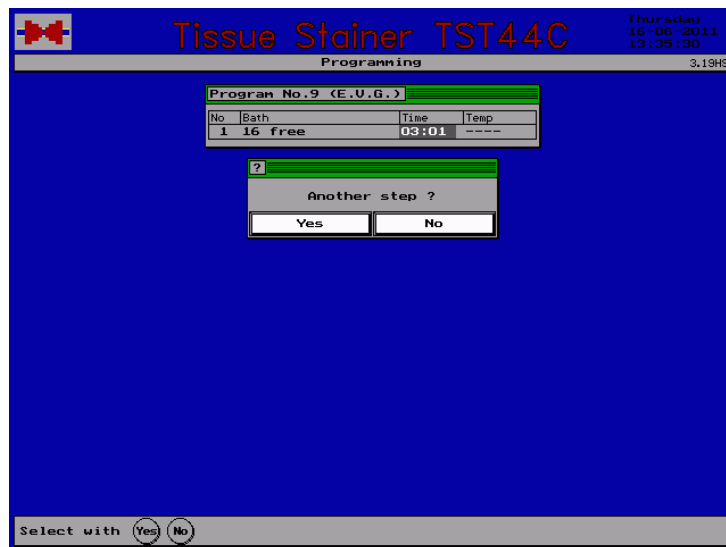
step press **<Input>**.

The question „Input correct ?“ appears.



Press **<Yes>** if all data are correct or **<No>** if you want to modify data.

The question „another step ?“ appears.



Press **<Yes>** if you want to edit another step.  
(Up to 40 steps are possible).



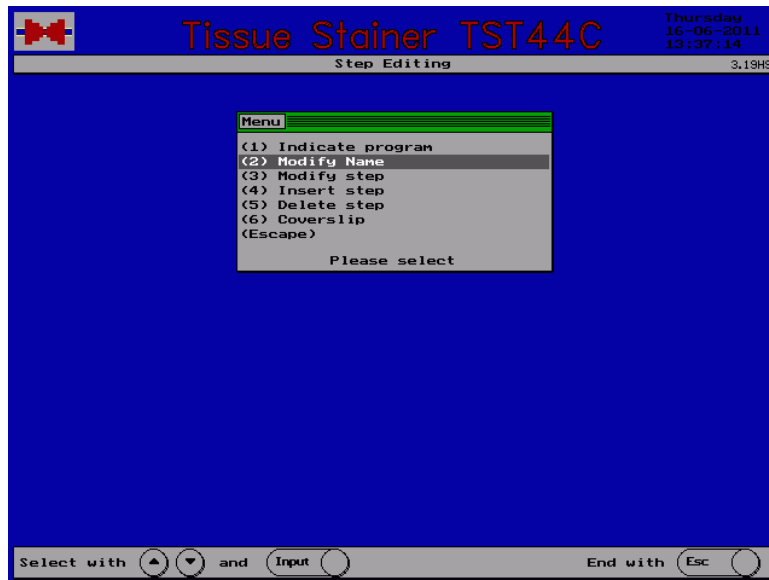
In case you pressed the key **<Yes>** the next step is indicated and can be edited as mentioned before.



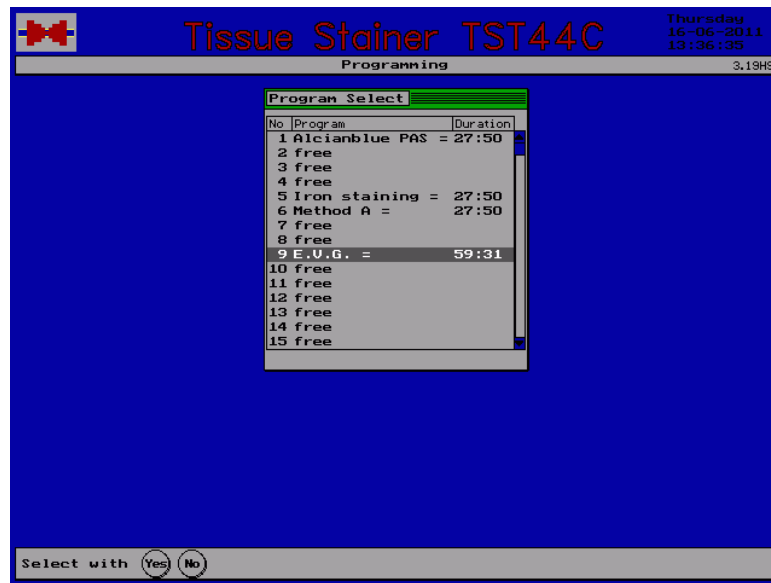
Repeat these steps until the staining protocol is completed and confirm the question „another step ?“ by pressing **<No>**.

### 3.3.3 Modify Program

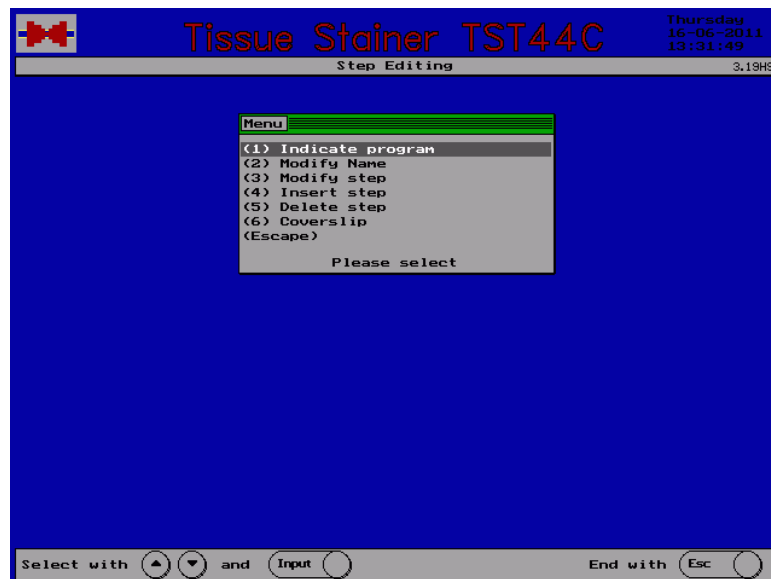
If you want to modify an existing program select point 3 of the menu „Programming“: Modify Program



appears.



Use the arrow keys to select the program to be modified and press **<Input>**.

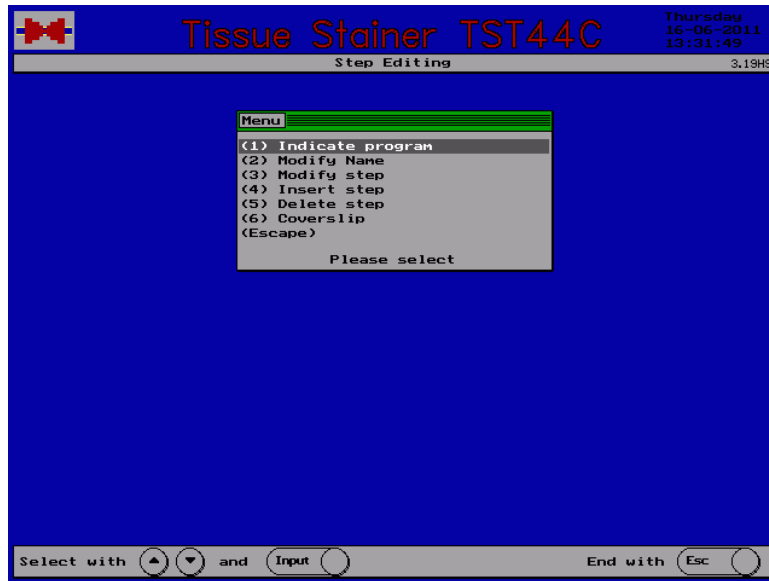


The menu „Step editing“ comprises all functions necessary to modify the stored staining methods.

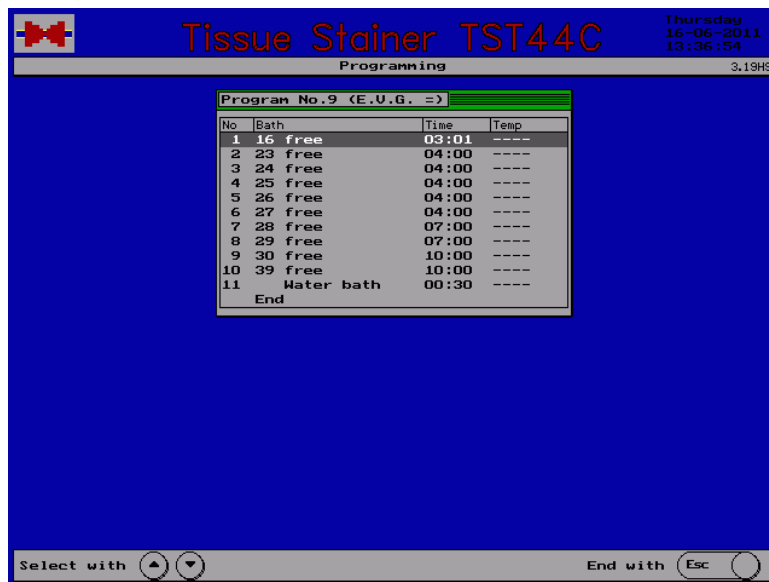
Select the required function by using the numerical keys.

By pressing **<Esc>** you return to the menu „Programming“.

The following pages describe all functions of step editing.

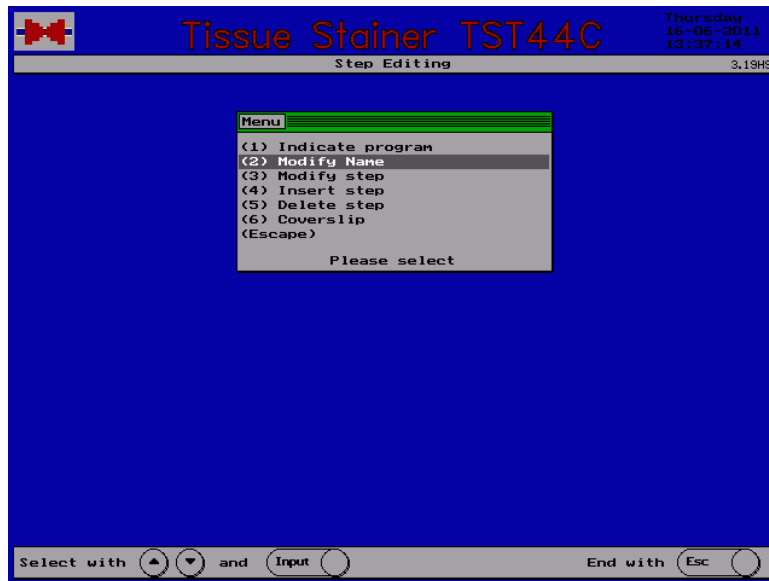


By pressing key 1 „Indicate program“ the staining method selected in function „Modify Program“ is indicated on the display.

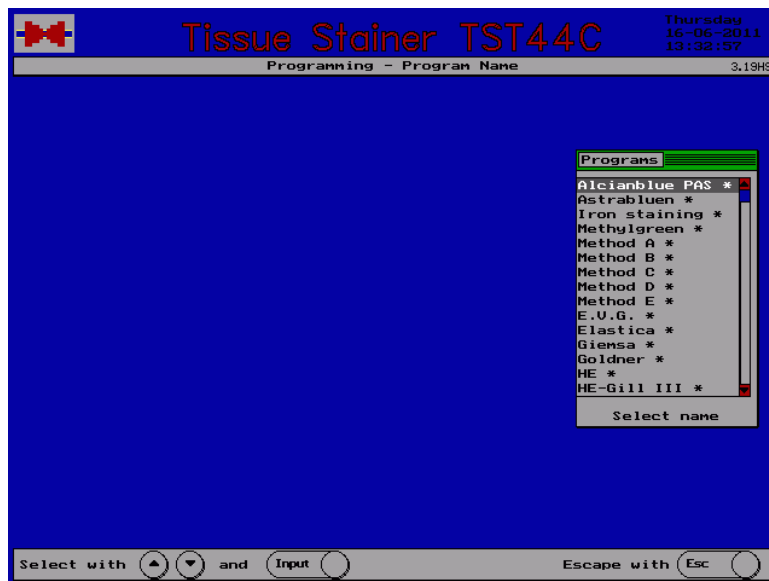


The indication is finished by pressing any key.

The name of the program can be changed by using function 2 „Select name“.

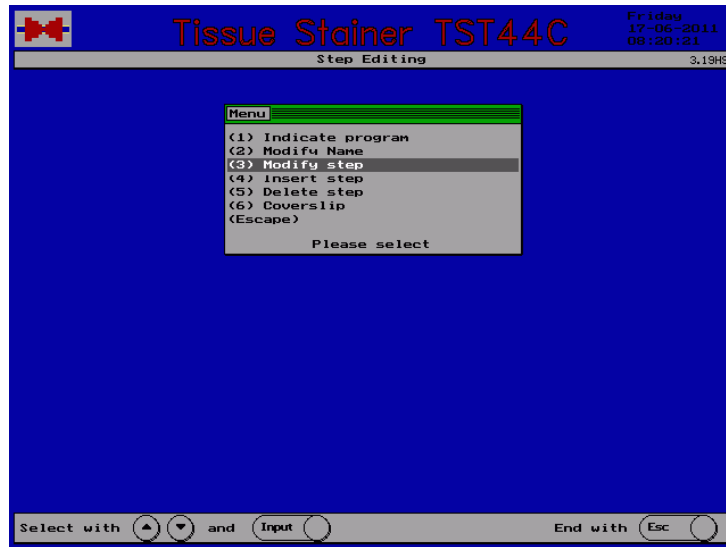


A list of possible program names appears.

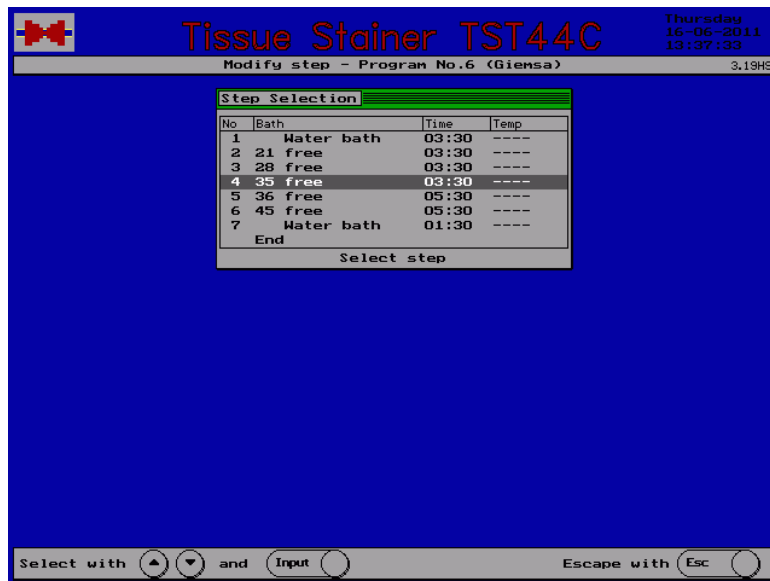


Select a name and press <Input>.

A single step of a staining method can be modified by using function 3 „Modify step“.



The staining method is indicated.



<Input>.

Now you can program the selected step.

A step comprises the number, the bath to be used and the immersion time, for the drying chambers (optional) also the temperature.

**Attention:**

**For safety reasons programs must be created so that a step with an inflammable liquid is never followed by the drying chamber as next step. Danger of ignition !**

Using the arrow keys the different columns are selected and the data for the indicated step are put in.

Select the bath to be used by the keys [+ ] and [- ] or by the arrow keys from the list of baths appearing on the display

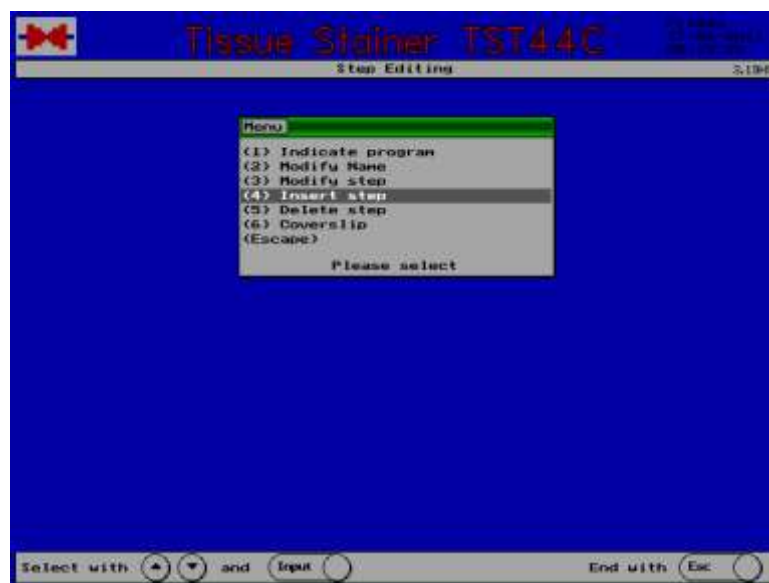
Select the immersion time using the keys [+ ] and [- ] or the numerical key 0...9.

Having finished the editing of the indicated step press <Input>.

The modification is finished by pressing the key <Esc>.

**Modify program - Insert step:**

A single step can be inserted in the staining method.  
Use function 4 „Insert step“



A staining method can comprise up to 40 steps.  
The staining method is indicated.



**A.MENARINI**  
diagnostics

**TOTAL TISSUE™**  
ICS

**Tissue Stainer TST44C** Thursday 16-06-2011 13:38:33

Insert step - Program No.6 (Giemsa) 3.19HS

Step Selection			
No	Bath	Time	Temp
1	Water bath	03:30	----
2	21 free	03:30	----
3	28 free	03:30	----
4	20 free	06:30	----
5	36 free	05:30	----
6	45 free	05:30	----
7	Water bath	01:30	----
End			

Select step

Select with and End with



Go to the position in the method where a step shall be inserted and press **<Input>**.



The step is inserted by copying the marked one. Now you can edit the new step.

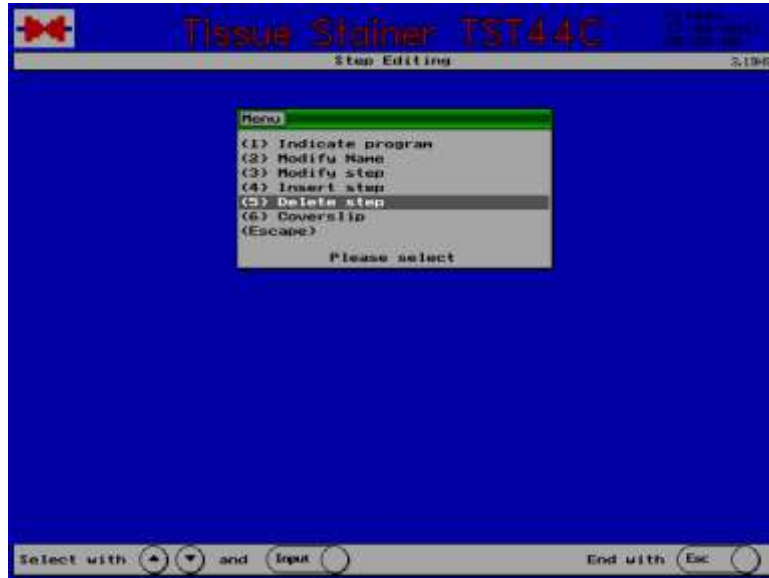
A step comprises the number, the bath to be used and the immersion time.  
 For the drying chamber (optional) it contains also the temperature.

**Attention:**

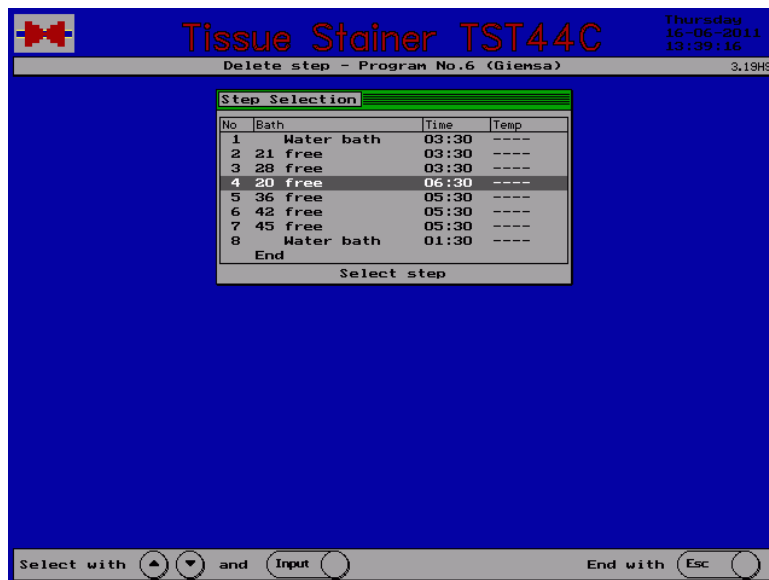
**For safety reasons programs must be created so that a step with an inflammable liquid is never followed by the drying chamber as next step.  
 Danger of ignition !**

A single step can be erased of the staining method.

Use function 5 „Delete step“

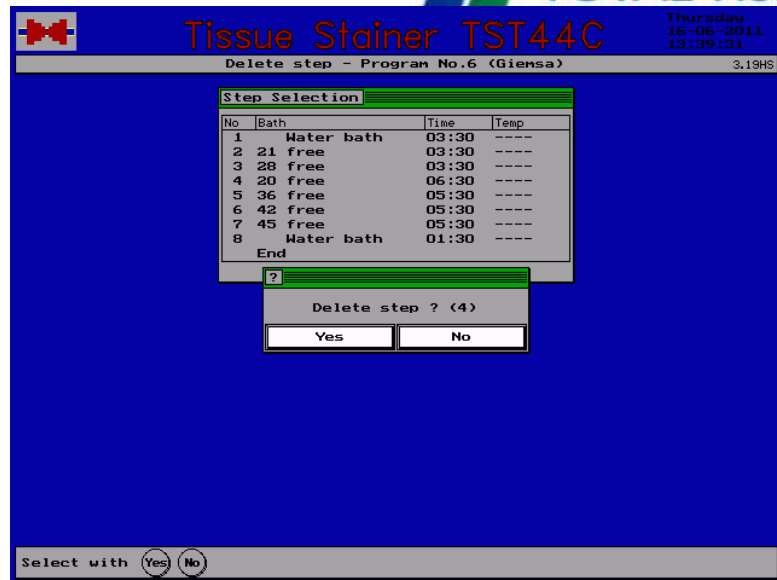


The staining method is indicated.



Select the step to be erased and press <Input>.

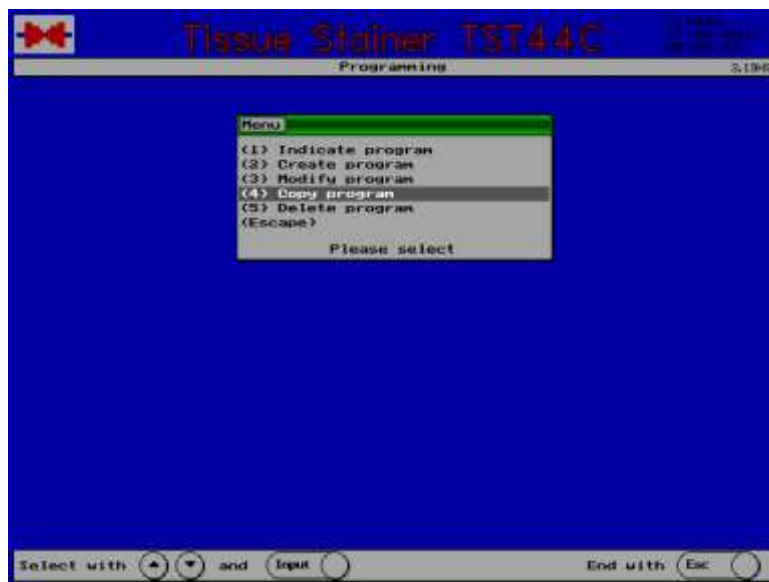
The question „Delete step ?“ appears, which is confirmed by pressing <Yes>.



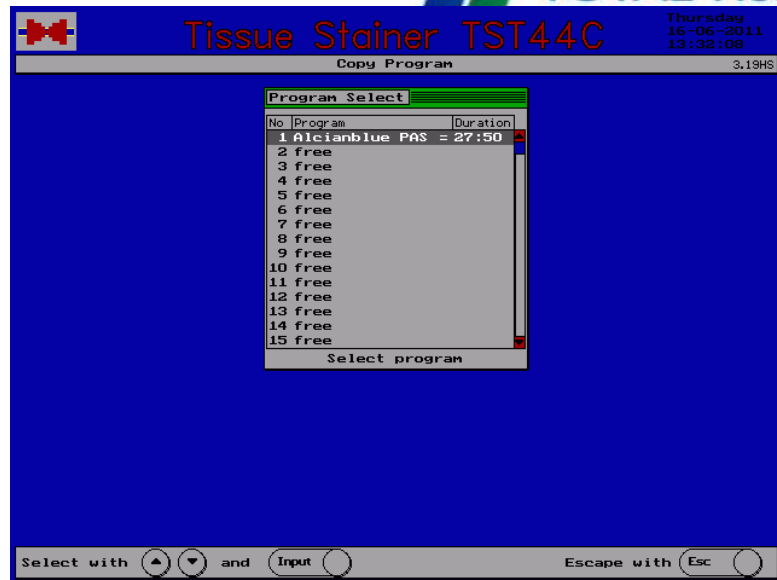
After having deleted the last step the step editing ends.

### 3.3.4 Copy program

Select point 4 of the menu „Programming“:  
Copy program.



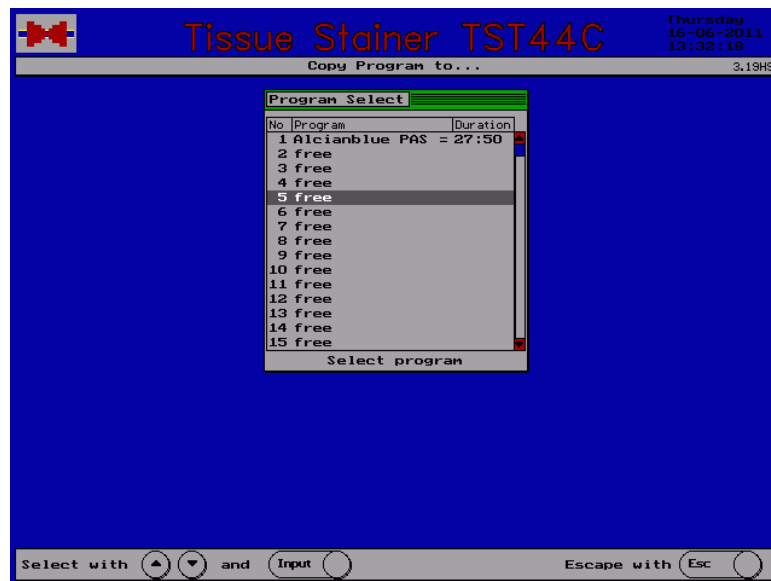
A list of the positions and the existing methods appears.



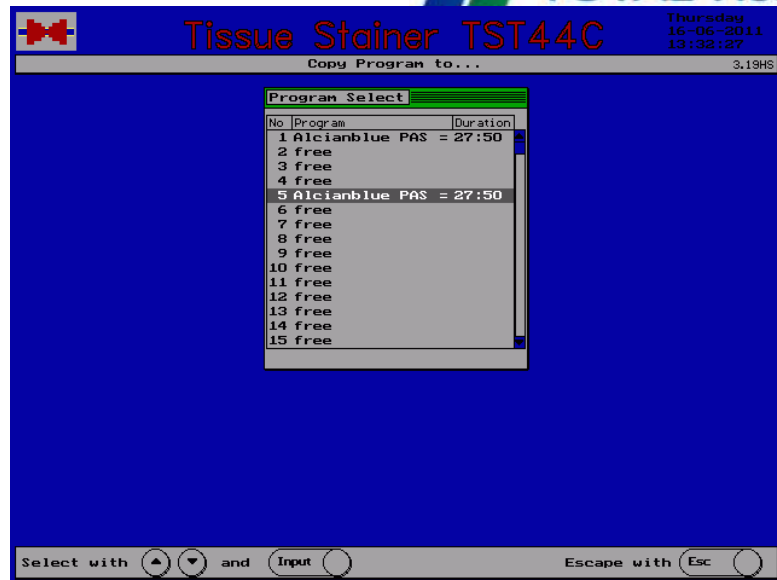
Use the arrow keys to select the staining method to be copied and press **<Input>**.

Empty positions are marked as „free“ and cannot be copied.

A list of existing programs and the question „Copy Program to...?“ appear.



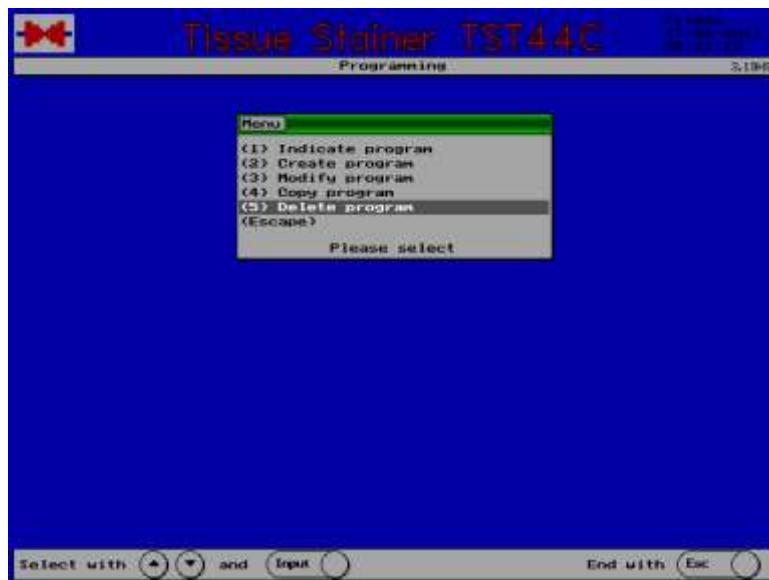
Select a free program position using the arrow keys and press **<Input>**.



You cannot copy to an occupied position.

### 3.3.5 Delete Program

Select point 5 of the menu „Programming“:  
Delete program.



A list of the positions and the existing methods appears.



Use the arrow keys to select the staining method to be deleted and press **<Input>**.

Empty positions are marked as „free“ and cannot be deleted.

The selected staining method and the question „Delete this program ?“ appear. To confirm press **<Yes>**.





### 3.4.1 Start a staining program

Select a free basket position and insert the basket carefully.

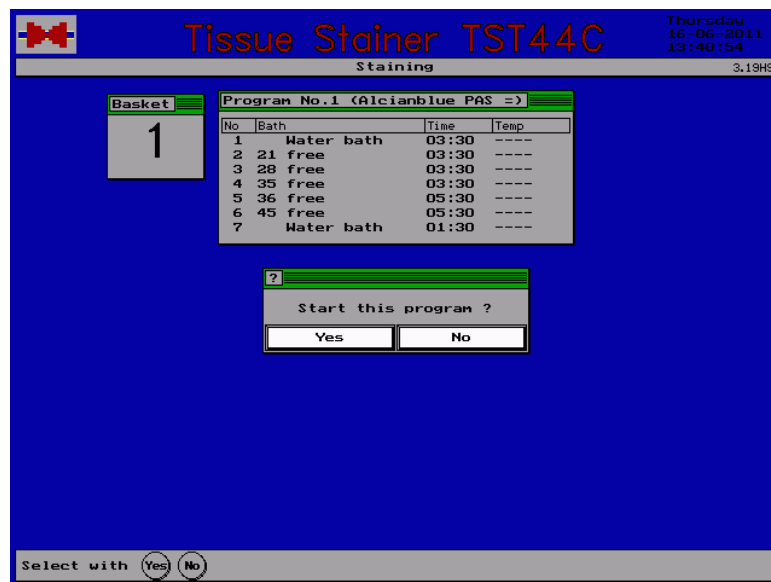
**IMPORTANT:**

The hangers (adapters) must sit perfectly in the jogs of the bar.

A free position is indicated by a green light near the Start keys.

Press the selected **<Start...>** key.

The staining method used last and the question „Start this program ?“ appear.



Press **<Yes>** if you want to start this program. Press **<No>** if you want to select a different program.

If you pressed **<No>** the program selection appears from which you can choose a program using the arrow keys.



Confirm with the key **<Input>**.

Having pressed **<Yes>** the selected program and the question „Start this program ?“ appear.



Press **<Yes>** if you want to start the program or **<No>** if you do not want to start the program.





After confirmation by pressing **<Yes>** the



selected program, the start and end time as well as the station appear.

**Tissue Stainer TST44C** Thursday 16-06-2011 13:41:04  
3.19HS

Basket	Program	Start	End	Bath	Contents	Status
1	Alcianblue PAS =	13:41	14:08	8		Loading 1

Interrupt with **Hold**

### 3.4.2 Stop a staining

A running staining method can be stopped any time. Press **<Hold>** to do so.

Input the number of the basket the program of which you want to abort and press **<Input.>**

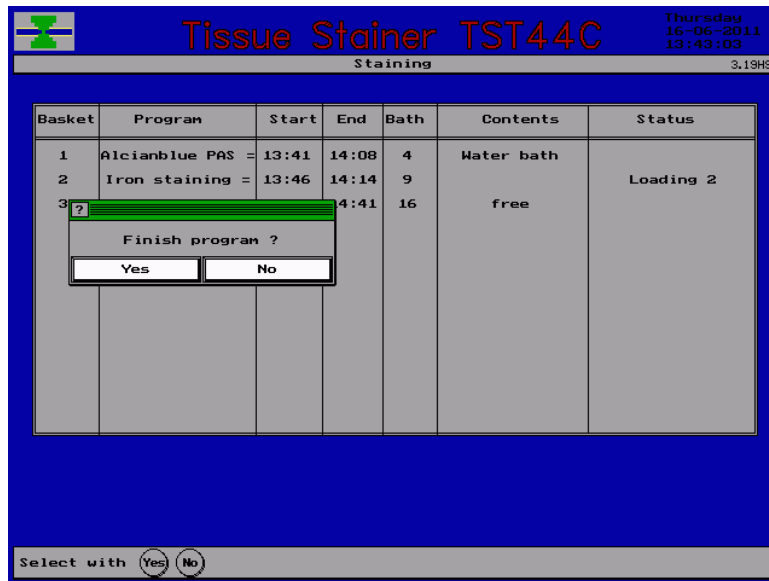
**Tissue Stainer TST44C** Thursday 16-06-2011 13:42:12  
3.19HS

Basket	Program	Start	End	Bath	Contents	Status
1	Alcianblue PAS =	13:41	14:08	4	Water bath	Loading 2
2	Iron staining =	13:46	14:14	9		
3	E.U.G. =	13:41	14:41	16	free	

Status  
Enter basket no.

Modify with **◀ ▶** and **0 ... 9** End with **Input**

is confirmed by pressing <Yes>.



The staining is now finished and the basket will be transported into the unloading position.

### 3.4.3 Special Functions

The contents of the baths can be indicated during a running process. Press the key <Bath Contents>.

After pressing the key <Esc> the running program is indicated again.



The actual state of the staining program is indicated by pressing <Status> followed by the <Basket...>-key.

After pressing the key <Esc> the running program is indicated again.



When the staining is finished there is an audible signal.

A notice „Unloading ..“ appears in the status column for the basket. The indication lamp for the unloading position in front of the instrument turns on.

Basket	Program	Start	End	Bath	Contents	Status
1	Alcianblue PAS =	13:41	0:00	4	Water bath	
3	E.U.G. =	13:41	14:41	16	free	

Interrupt with

Basket	Program	Start	End	Bath	Contents	Status
1	Alcianblue PAS =	13:41	0:00	15		handover
3	E.U.G. =	13:41	14:41	16	free	

Interrupt with

Take out the basket.

## 4.1 Notes

Any failure occurring during the operation of the TST 44 is indicated by an alarm sound and light.

Depending on the kind of failure either in the pilot line or in a separate window a notice is indicated on the display.

With the exception of system errors the failures can normally be cleared by the user.

Please refer to the trouble shooting list on the following pages.

## 4.2 Error Messages

<b>Please set clock</b>	<p>After switching on the instrument, time and date are checked.</p> <p>If the date is earlier than Jan. 1 of 1992 the mentioned note appears.</p> <p>The clock is set in the menu „System set-up“:</p>
<b>Change filter</b>	<p>After switching on the instrument the number of working hours passed since the last filter change is checked.</p> <p>After 200 hours the mentioned note appears.</p> <p>The change of the filter is confirmed in the menu „System Set-up“.</p>
<b>Power failure</b>	<p>The power supply has failed.</p> <p>The instrument is now supplied by the emergency battery.</p>
<b>System error</b>	<p>There has been a failure during operation.</p> <p>Please note the indicated error message and call the service department.</p>

<b>Printer not ready</b>	<p>The TST 44 cannot send any data to the report printer. Check the readiness of the printer (online) and the connecting cables.</p>
<b>Close hood</b>	<p>For safety reasons the hood must be closed during operation.          The basket transport is interrupted immediately when the complete hood is opened.          Please refer to chapter 1 (General)</p>
<b>Basket error</b>	<p>If the transport mechanism could not handle a basket a message „Basket error“ appears.          Check if basket is damaged, not in position or if position is occupied.</p>



- Description:** Linear Staining system
- Stations:** 44 stations (4 loading-, 4 unloading-, 6 (4) running water-, 30 staining stations, (2 drying chambers optional)  
For every station the description of its contents can be determined from a list of 99 different reagents
- Bath volume:** 450 ml
- Capacity:** 12 baskets with 20 or 30 slides each.
- Staining:** Menu-driven operated by key pads and controlled on a graphic display
- Program range:** Free choice of the bath to be used and the immersion time.  
20 staining methods with 40 steps each storable.  
A program name can be chosen from a list of 23 different terms
- Power supply:** 230 V / 50 Hz or 115 V / 60 Hz - 100 VA max.
- Dimensions:** Width: 1210 mm, Depth: 670 mm, Height: 640 mm
- Weight:** approx. 115 kg