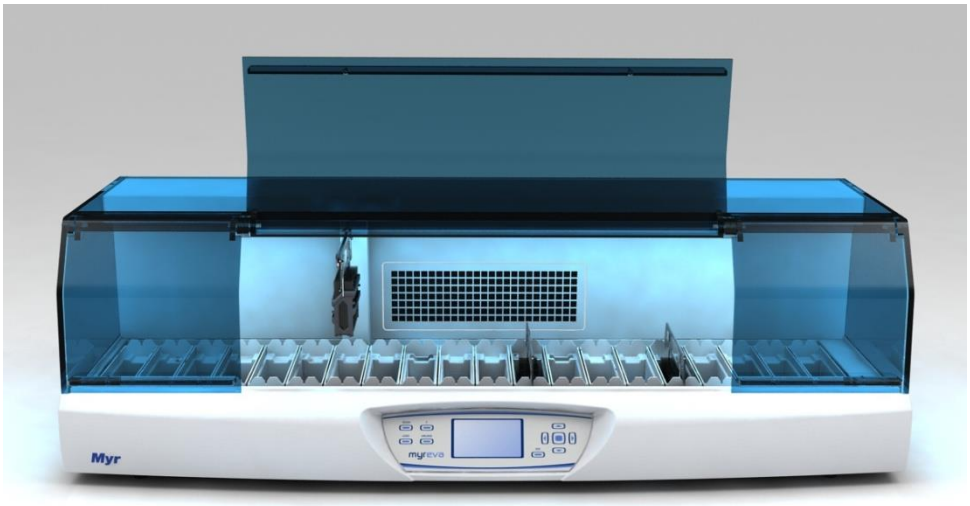
Slide Stainer MYREVA SS-30 and SS-30H



User manual
Version 13 – 11/11/2022

Especialidades Medicas Myr, S.L. would like to thank you for the purchase of this equipment and for your confidence in choosing our company.

We are committed to offer you the best and most reliable service.

Don’t hesitate to contact your local dealer for any question related to this Slide Stainer.

Your Especialides Médicas Myr, S.L. team

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Introduction

The Slide Stainer MYREVA SS-30 is an automatic programmable device for Cytology and Histology processes. It is composed of a metallic chassis with epoxy coating holding reagents troughs, washing troughs, robotic arm X/Y and electric fun with active charcoal filter. The instrument also features a transparent cover with three hinged doors. 2 versions are available:
SS-30: Automated Slide Stainer
SS-30H: Automated Slide Stainer with drying station

The Slide Stainer MYREVA SS-30 is designed for professional use only. It must only be operated by trained and qualified laboratory personnel.

The users of the device must previously read the User Manual carefully and must be familiar with all aspects of operation and safety precautions before starting out to operate the instrument.

Intended use

The SS30 slide stainer is an automatic device designed for the staining of human tissue specimens to contrast cell formations and their components for medical histological diagnostic purposes by a pathologist.

The SS30 slide stainer is exclusively intended for use in In Vitro diagnostic procedures and fulfils the corresponding in-force regulations.

Any other use not described above is considered improper use!

Warranty

The Myr product is warranted against defects in material and workmanship for a period of 1 year.
Parts which prove to be defective during the warranty period will be repaired or replaced free of charge.

No other warranty is expressed or implied.

Unauthorized modification or repair by third party persons will void the warranty.

The warranty will expire in case of improper or wrong use of the instrument and in case the warning and precautionary messages are not observed. Especialidades Médicas Myr, S.L. is not liable for any occurring damage.

Once the guarantee period has expired, a maintenance contract should be signed to ensure the unit is kept in optimum operating condition. For more information on maintenance contracts, please contact your local distributor.

Certification

Especialidades Médicas Myr, S.L. certifies that this instrument has been tested and checked carefully. All technical data were checked prior to shipment to ensure that they match the published specifications.

The instrument complies with applicable international safety regulations.

Safety

The installation and normal use of the Slide Stainer is simple and safe if you observe the instructions given in this manual.

Should the equipment be used for unauthorised purposes or uses not specified by the manufacturer, safety may be impaired.

Input and output circuits are isolated from the main power supply.

However, those situations which could be constitute a risk for laboratory personnel or equipment, are distinguished in this manual with the following symbols and warning messages:

This sign, symbolizing **DANGER**, means that injury to persons as well as material damage to the unit may occur if these instructions are not observed.

For your own safety, observe these instructions carefully.

This sign, symbolizing **CAUTION**, means that damage to the unit may occur if these instructions are not observed.
For a long service life of the unit, observe these instructions carefully.

The symbol shown here indicates areas where the temperature may exceed 60°C

This **INFORMATION** sign draws the user's attention to important details and additional information about the device, and should therefore especially be taken into account.

All persons who are required to operate and programme the Slide Stainer should read and fully understand these instructions before using the device.

Warning of biological danger.

Warning of radioactive danger.

Safety Precautions

The operator's safety is affected, when the instrument is not operated in accordance with this instruction manual.

Apart from the instructions given in this manual, the personnel involved in operating the Slide Stainer should know and observe the general guidelines and rules for safety and hygiene applicable to the workplace where the unit is installed.

Please observe the following general precautions during operation of this instrument. Failure to comply with these precautions violates safety standards and the intended use of the instrument. Especialidades Médicas Myr, S.L. is not liable for misuse of the instruments and failure to comply with basic safety requirements.

Hazards

Instrument grounding
The instrument is supplied with a 100-240 V ∿mains adapter with a 12V output transformer⎓. The power outlet must be connected to the protective earth and must meet the International Electrotechnical Commission (IEC) regulations.

Danger in explosive environment
The instrument must not be operated in the presence of flammable gases. Moreover, the instrument must not be exposed to conditions whereby dangerous gas concentrations can occur.
As there is a risk of fire if working with an open flame (e.g. Bunsen burner) near the equipment (solvent vapours), a minimum distance of 2 metres between the flame and the slide stainer should be maintained.

Hazard of radio-active radiation
When working with radioactive specimens observe all applicable radiation safety procedures. When working with radioactive contaminated material, appropriate safety and disinfecting measures must be carried out. According to the rules and regulations concerning the handling of radioactive contaminated material of the respective laboratory, safety clothing (e.g. particle mask, gloves, protective shoe covers) must be worn. Radioactive contaminated waste must be disposed of according to the respective regulations.

Chemical hazard
When working with the Slide Stainer, sometimes it is necessary to handle flammable, dangerous fluids. Only trained and qualified laboratory professionals, being aware of the potential dangers and being capable of handling those fluids properly, are allowed to use the instrument.
Before handling dangerous liquids, you must make sure to have read and understood the MSDS and specifically understood the safety instructions and the instructions for proper disposal.

Wastewater treatment
According to environmental regulations, the occurring waste water should be drained into a discharge channel with subsequent biological/chemical purification.

When the instrument is not in operation, the reagent troughs should be covered with the plastic lids supplied to minimise reagent evaporation.

Fume accumulation
Remember that, when working with the device, reagent fumes that are harmful to health always form. The Slide Stainer should always operate with the active carbon filter fitted or the discharge duct connected to a fume extraction system.

To prevent the accumulation of fumes that can damage the internal components of the machine: ***NEVER TURN OFF THE MACHINE WITH THE SWITCH WHILE REAGENTS REMAIN INSIDE***. Leave the machine in sleep mode to enable the programmed extraction cycle to be performed. See page 21.

Hazard of infection
Specimens used during the intended operation of the instrument might potentially be infectious. For this reason, it is recommended to observe the general laboratory regulations concerning protection against danger of infection. Information on decontamination media, their use, dilution and effective range of application can be read in the Laboratory Biosafety Manual: 1984 of the World Health Organization.

When working with infectious material, appropriate safety and disinfection measures must be carried out. According to the rules and regulations concerning the handling of infectious material of the respective laboratory, safety clothing (e.g. particle mask, gloves, protective shoe covers) must be worn. Infectious waste must be disposed of according to the respective regulations.

Burn hazard
The drying station can reach high temperatures. Take care not to get burned.

Hazards associated with faults caused by electromagnetic interference
To avoid the hazard of malfunction of an instrument, it must only be operated in a controlled electromagnetic environment. This means that transmitters such as mobile phones must not be operated in their close vicinity.

In case of malfunctions and/or service work, please turn off the instrument and contact your local dealer.

Hazards associated with the device's moving parts
Due to the potential hazards associated with the operation of devices with moving parts, the Slide Stainer must only be used by professionals or properly-trained personnel. We recommend that the unit should not be handled with the cover open, except during loading and unloading, and in accordance with the safety conditions detailed below. To avoid danger, moving speed has been reduced.

Documentation

This instruction manual will be supplied together with each instrument. Additional copies can be ordered by indicating the serial number of the instrument.

This manual has been written in the Spanish language and it has been translated into English and French. The Spanish version shall prevail. Especialidades Médicas *Myr, S.L.* shall not be liable for the consequences of mistakes, omissions or other defects in the translation of this manual.

Subject to amendment and improvement without notice.

Conditions for the transportation of the instrument

Repair or maintenance work are normally carried out at the site of installation. If this is not possible for some special reasons, the instrument can be returned to Myr. The contact address can be found at the end of this instruction manual.

For transportation outside closed buildings use the original packing.
If the original packing is no longer available, please contact your local Myr representation.

Technical data

General information	
Power Requirements	Through a transformer: SS-30: Input: 100-240V ∿, 1.5A, 50-60Hz Output: 12V ⎓, 5.5A SS-30H: Input: 100-240V ∿, 2.0-1.0A, 50-60Hz Output: 12V ⎓, 12.5A Power supply voltage fluctuations: 10%.
Water supply	Supply: Running water Maximum pressure: 4 bar Water temperature: Less than 30°C (86°F) without freezing Fitting: Standard ¾” Drainage: By gravity Pipe diameter: 20 mm
Classification in accordance with IEC 61010	Protection class I
	Pollution degree 2
	Overvoltage category II
Operating conditions	Operating temperature range: 5 - 40ºC Relative air humidity: 10 - 80% non-condensing
	FOR INDOOR USE ONLY
	Do not place the equipment in a position that prevents the transformer connector from being unplugged (electrical disconnection). The optical level sensors cannot be used with Xylene, Toluene, Benzene, chlorinated solvents or other products incompatible with Polysulfone
Dimensions and weight	
Dimensions	1200 x 440 x 368 mm (W x D x H)
Weight when unloaded and without packaging	55 kg
Total weight with packaging	92 Kg
Transportation and packaging conditions	Temperature: -20°C to +50°C
Operating capacity	
Processing capacity	Up to 5 racks at a time, depending on the programmes, load frequency and device configuration. Simultaneous performance of up to 5 different staining protocols
Load capacity per rack	30 slides
No. of programmes in the memory	Stores up to 20 programmes, each with up to 50 steps
No. of reagents in the memory	Maximum 52 (49 user-configurable)
Immersion time	1 s - 59 m 59 s per step.
Number of stations	20
Reagent stations	Up to 19
Reagent tray volume	300 ml
Cleaning stations	Maximum 3
Loading stations	Maximum 2
Unloading stations	SS-30: Maximum 3
	SS-30H: Maximum 3 (2 with drying chamber active)
Fume extraction	Active carbon filter
Battery life	2 hours (lithium-ion batteries)
	Only batteries approved by the manufacturer are permitted to be used

Reception and installation of the unit

Before removing the Slide Stainer from their shipping package, carefully inspect the wooden case for any damage which may have occurred during transport. Should you detect any sign of damage, do not open the case and immediately report the situation to the transport agency.

After removing instrument from its package, inspect it carefully for damage. Should any be noted, immediately notify the distributor from whom the unit was purchased.

Remove the protective pieces and elements used for transportation. Please keep the original packaging and protective pieces in case the device needs to be returned.

Check that the following items have been supplied:

Items included in the box

• Basic device **SS-30** • 20 reagent troughs • 1 power supply with transformer 12V ⎓ 5,5A	• Basic device **SS-30H** • Up to 19 reagent troughs • 2 drying troughs • 1 power supply with transformer 12V ⎓ 12,5A

- 3 complete water troughs with fittings.
- 3 water supply tubes with fittings for water troughs
- 1 tool to cut the trough water supply tubes
- 23 plastic lids for the reagent troughs
- 3 racks + supports (30 slides)
- 1 active carbon filter
- 1 mains adapter with transformer 12V ⎓ 5A
- 1 power cable
- 1 USB cable for connection to PC
- 1 water supply hose (1.5 m) complete with ¾" connection fittings
- 1 corrugated drain hose (3 m)
- 1 set of clips for drain hose
- 1 spirit level
- 1 user manual

Remove the protective elements securing the robotic arm. Do not attempt to move it manually. The robotic arm will move to its starting position the first time the instrument is turned on.

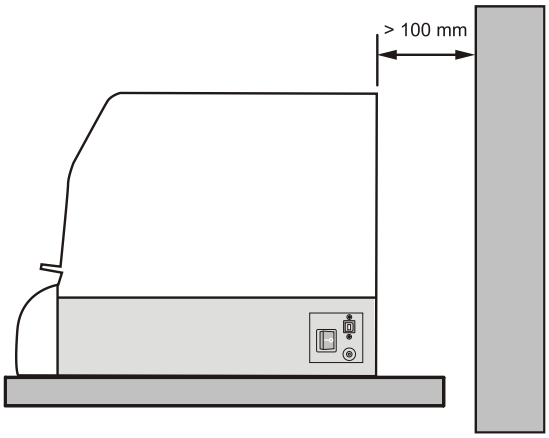
When choosing where to install the instrument, as well as its dimensions, also take into account its weight. See the dimensions and weight on page 9.

The installation site must be well ventilated and free from any flame or source of sparks.

Place the instrument on a stable and level surface. Use the spirit level supplied to ensure that the Slide Stainer is installed to facilitate the flow of water to the drainage area.

Make sure that there is enough space to fully lift the covers and allow air to circulate.

The fume extractor outlet is located at the back of the instrument. For correct ventilation of the instrument a minimum space of 100 mm from wall should be kept free.



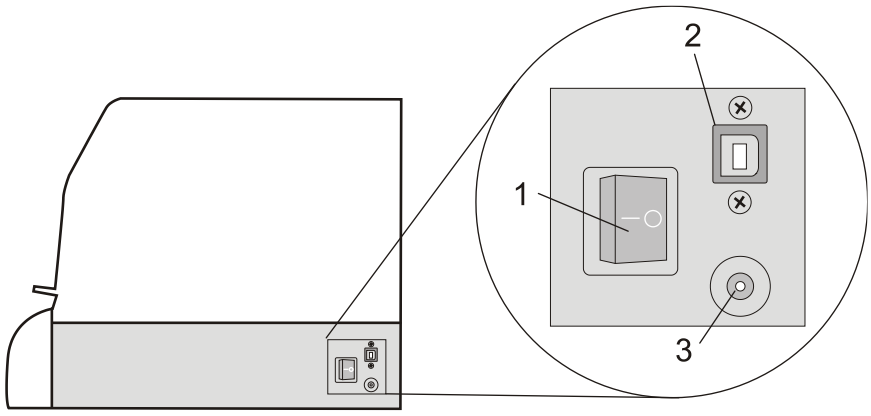
Connection

Connecting to the mains

CAUTION
Electronics of the Slide Stainer are protected and screened. However, the instrument should not be sited near to heavy electrical machinery generating heat, vibrations or strong electrical noises.

The slide stainer is supplied with a power cable and transformer to be plugged into a standard socket with earth connection. The power supply socket is on the right-hand side of the device.

1 Power switch
2 USB port
3 Power supply socket

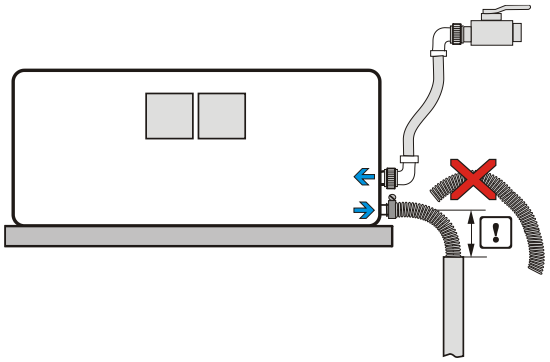


Mains adapter

USB cable

Water inlet and outlet

The water inlet is connected to a standard household appliance hose with a ¾" threaded fitting supplied with the device. The water supply must be equipped with a stopcock (not supplied) to enable it to be turned off.
Myr accepts no responsibility for the connection between the water supply and the equipment.



The hose supplied for connection to the water outlet has an inner diameter of 20 mm and must be attached to the outlet nozzle with the hose clip supplied.

Be sure that the drain level is always at a lower level than the unit and the hose is always hanging downwards.

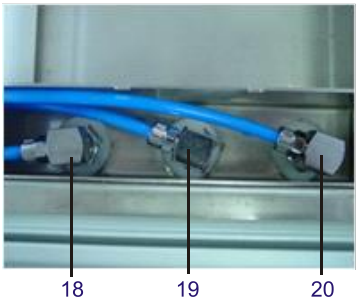
Remember to shut off the water supply after working with the device.

Rinsing trough water connection

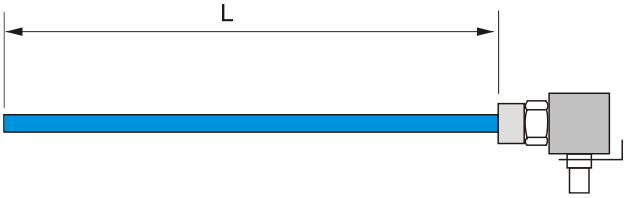
One of the main features of the Slide Stainer is its modularity and adaptability to user needs.

The Slide Stainer can have up to **three** rinsing troughs with water in any station between 5 and 17.

To determine in which stations the water troughs should be located, consult the person responsible for programming or the pathologist, who will determine the optimum positions for the type of process to be performed.



In stations 18, 19 and 20, there are **three** water outlets with rapid self-locking fittings, which have to be connected, with the flexible hoses supplied (cut to a suitable length), to the troughs in the stations that have been selected as rinsing troughs.
The length of the tube (L) will depend on the position of the water intake station and the destination station.



Length L in mm is calculated with the formula: (Nt - Nc) * 55 - 16

Nt is the number of the station in which the water inlet is located.
Nc is the number of the station containing the trough to be connected.
55 is the distance in mm between the troughs and water inlets.
16 is the measurement in mm taken up by the fittings.

It is recommended that you use the outlet of station 18 to feed the station closest to the beginning, station 19 for the middle one and station 20 for the one nearest the end.

Remember that the way that the water troughs are arranged will be determined by the processes to be carried out in order to optimise the performance of the Slide Stainer.

For the example processes shown here, the optimum stations are 6, 8 and 10, which have lengths L of 644 mm, 589 mm and 534 mm respectively. See the Reagent map on page 23.

Commisioning

Introduction

If you are using the Slide Stainer for the first time, before you start any real staining processes, you are strongly advised to familiarise yourself with the handling and programming of the device. To do so, we suggest that you perform some process simulations **without samples or reagents**. You can allow the water troughs to be filled, which will also verify that they can fill up and drain correctly.

Before starting to work with the Stainer, it is advisable to perform a status check. Check the following:

Power Requirements
Check that the power switch is on and that voltage is reaching the device. The window in the bottom left-hand corner illuminates, except when it is being powered by the backup battery (for more information about autonomous operation with the backup battery, see page 49). The display screen also illuminates.

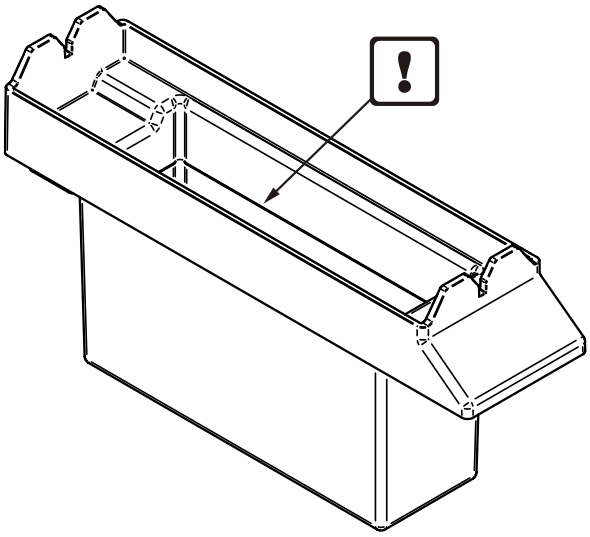
Water inlet and outlet
Check that the stopcock for the device's water supply is turned on and the drain connected. On page 20, you will find the procedure for forcing the entry of water into the previously-connected troughs and verifying that it is functioning correctly.

Troughs
The Slide Stainer is equipped with 20 stations, which correspond to the location of 20 troughs. The first ones are used for loading racks and the last ones for unloading.

SS-30H Station 20 of the SS-30H slide stainer can also be used as a drying/dewaxing station. For this, it features a special trough (marked with an H) with a side opening to enable the samples to be dried (see next page).

Check that the 20 troughs are positioned correctly and not inverted. If they are not positioned correctly, significant mechanical problems can occur.

To prevent the reagents from overflowing, the troughs should only be filled up to the level indicated on the inner recess.



Note that the reagent that each trough should contain is determined by the previously-established **Reagent map**. See page 23.

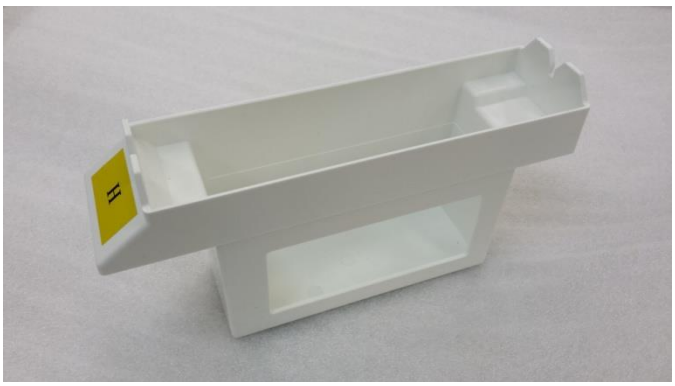
The number of loading troughs can be set at 1 or 2 and unloading troughs at:

Model SS-30	Model SS-30H
1, 2 or 3	1, 2 or 3 (without drying trough) 1 or 2 (with drying trough)

Only SS-30H

When you use the drying trough in station 20, and given that it cannot in this case be used as an unloading station, place an empty trough into station 19 and programme it as an unloading station from the programmes that use drying station 20.

The drying trough is labelled with an "**H**". Make sure that it always occupies station 20 if it is used as a drying/dewaxing station.



Only SS-30H Pay special attention to the programmes that use the drying station. In these cases, make sure that the previous programmed step cannot originate from a trough containing a flammable reagent (e.g. xylol). This is to prevent a possible fire.

Robotic arm
Check that the robotic arm is located on the left-hand side of device and in a raised position (starting position). If not, press **F** key to situate the arm in the initial position.

Rack collection.
To check that the robotic arm is collecting the racks properly, see the **MOVEMENT** procedure on page 20.

Slide stainer components

The figure below shows the Slide Stainer's different components.

1. Loading door
2. Central door
3. Unloading door
4. Robotic arm
5. Slide rack (maximum 5)
6. Troughs (20)
7. Display screen and keypad

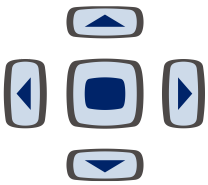
Display screen and keypad

The **DRAIN** key is used to enable or disable the draining of the racks as they leave each trough. If enabled, the word **DRAIN** appears on the monitoring screen.
This function can only be enabled or disabled when the Stainer is not performing any processes.

The **F** key is used to abort all staining processes that have been started and to situate the arm in the initial position with the equipment in standby mode and away from the process screen.

The **LOAD** key is used to confirm the steps of the loading process.

The **UNLOAD** key is used to confirm the steps of the unloading process.

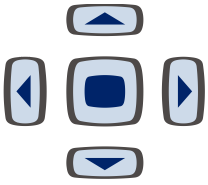


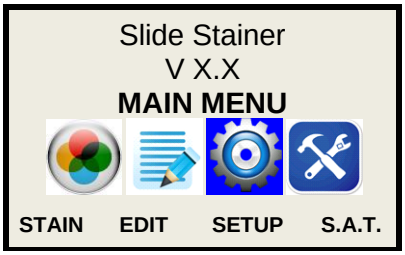
The arrow keys are used for navigation (option selection) within the different menus, and the middle key is used to confirm or validate the selected option. It is equivalent to the **ENTER** key.

The **ESC** key is used to exit the various menus in which values and operation options are entered.

Menus and options

Main menu





The main menu shows the four main options.

Use the arrow keys to highlight the option you wish and press **ENTER**.

STAIN

This is the normal operation option for performing processes. It enables the user to select the programme to run, control loading and unloading of the racks in the troughs and view current processes.

EDIT

This allows you to enter and edit programmes with the keypad. Remember that you can also edit programmes with a PC and then transfer them to the Stainer via a USB.

SETUP

This enables you to adjust the stainer settings, such as language, date, speed, dip, etc.

S.A.T.

Technical Support Service: This provides access to advanced functions which must only be modified by authorised personnel.

Configurations and settings

STAIN

Before starting the **first staining process**, some parameters have to be configured in the **EDIT** and **SETUP** menus.
Once the settings have been adjusted and the reagents and programmes edited, the **STAIN** process can be started. See the details of how to run a staining process on page 27.

EDIT

REAGENTS

This enables you to enter a numbered list with the reagents used. This list is merely informative and is used to facilitate the entering of the names of the reagents during programme editing.

VIEW/ EDIT

Enables the entering of the reagents to be used, numbered 1 to 52. See an example reagent list on page 22.

DELETE

This enables you to selectively delete reagent positions.

Only in SS-30H

MAP

Enables each station to be assigned with a reagent and, optionally, its useful life in days and/or operating cycles (racks processed) to be tracked. See page 28

PROGRAMMES

Before starting a staining process, the Stainer needs to be provided with the sequence of steps that each rack must follow. The Programming Forms must be previously defined. See page 23.

VIEW/ EDIT

This enables you to enter programmes.
View the editing procedure in detail on page 27.

DELETE

This enables you to selectively delete programmes.

SETUP

Some of these settings can only be configured during initial device start-up (e.g. language, clock).
Others will only require changes if so decided by the pathologist responsible for the procedure (reagents, dip, speed, etc.)
Also included here are the parameters that control the fume filter and ventilation.
Each option includes a brief summary of its function.

LANGUAGE

Use the arrow keys to select the language and then press **ENTER**.

SPANISH

ENGLISH

CLOCK

Use the arrow keys to select each parameter and then press **ENTER**.
Within each option, use the arrow keys to increase or decrease the value and then press **ENTER** to confirm.

Clock edit menu
Edit date: DD/MM/YY
Edit hour: HH:MM:SS
Type: 12/24H

DIP

Dip of the rack within the trough.

The dip height, dips number and dip speed of the rack in the reagent and washing troughs can be adjusted.

REAGENT

This affects the reagent stations.
It is possible to define up to **4 Dip Modes**, each with separate parameters.

With the arrows, select the **Dip Mode** to be defined (01... 04).
Press **ENTER** to access each of the parameters and select the value using the and arrows.
The example shows the editing of Mode 01 parameters for the reagent stations.

REAGENT S. - [MODE 01]

Dip Height (mm.)	**20**
Dips Number	**4**
Dip Speed	**2**

Dip Height (mm.) 10-**20**-30

This value determines the vertical travel of the rack during dip within the trough. The standard value is 20 mm.

Dips Number: 1-2-3-**4**-5-6-7-8-9-10

This value determines the number of times the rack will be moved during dip within the reagent trough. The standard value is 4.

Dip speed: 1-**2**-3-4

***Please note:** value 1 is the **highest** speed and value 4 the **lowest**. The standard value is 2.*

CLEANING

This affects the washing stations.

With the arrows, select the **Dip Mode** to be defined (01... 04).

Press **ENTER** to access each of the parameters and select the value using the and arrows.

The example shows the editing of Mode 01 parameters for the washing stations.

CLEANING S. - [MODE 01]

Dip Height (mm.)	**40**
Dips Number	**4**
Dip Speed	**2**

Dip Height (mm.) 20-30-**40**-50-60

This value determines the vertical travel of the rack during dip within the trough. The standard value is 40 mm.

Dips Number: 1-2-3-**4**-5-6-7-8-9-10

This value determines the number of times the rack will be moved during dip within the reagent trough. The standard value is 4.

Dip Speed: 1-**2**-3-4

***Please note:** value 1 is the **highest** speed and value 4 the **lowest**. The standard value is 2.*

SPEED

This option enables the speed of the vertical movement of the rack to be determined.

Speed edit menu

Lifting speed: 1-**2**-3-4

Lowering speed: 1-**2**-3-4

***Please note:** value 1 is the **highest** speed and value 4 the **lowest**. The standard value is 4 for raising and 3 for lowering.*

Note that the slowest elevation speeds (e.g. 3, 4) produce less reagent drag.

WATER

Water flow menu

Water valve (closed/open)

This enables you to manually open or close the solenoid valve that controls the entry of water into the Stainer. It is used to check trough filling time and to ensure that water flow does not exceed draining capacity. Check that the filling time is about 13 seconds per trough.

Valve time: MM:SS

This indicates how much time has elapsed with the valve open.

Rinsing Time: 0-30-**60**-90

This determines how long water will continue circulating in the rinsing troughs after the rack leaves the trough.

MOVEMENT

This option allows you to check the functioning of the robotic arm. Select Setup > Movement.

The device requests you to place a rack in station 1 and to confirm the placement by pressing **ENTER** to perform a rack collection cycle. Press **ESC** to cancel the option.

If the rack is not collected properly, notify the person responsible for the device's maintenance.

Only in SS-30H

DRYER

Drying/dewaxing station menu

Status (ON/OFF)

Enables the drying station to be activated/deactivated.

Temperature

Sets the drying temperature

Celsius/Fahrenheit

Sets the temperature scale as Celsius or Fahrenheit

Attention: Burn hazard
If you activate the drying station, be aware that high temperatures are generated in its immediate vicinity.

FILTER

Fan edit menu
This option defines filter usage time and useful life, as well as fan usage time.

FILTER

Filter Use Time (h) 0...150
This time depends on how long the fan has been operating. It determines the operating time in hours (with the fan running). Its value will also depend on the reagents used and the type of filter (see the filter supplier's instructions).

Remaining Time (h)
This indicates the time remaining before the stainer emits a "change filter" alarm.

Reset
This option should only be enabled after a filter change. It resets the filter usage time.

FAN

Fan On First Time (s): (0 … 300)
This establishes how long the fan should operate each time the device is turned on with the power switch. Once this time has elapsed, the fan switches off and then switches back on and off in accordance with the programmed on and off times. Normal value 120 s

Fan Off Time (s): (0 … 900)
Normal value 300 s

Fan On Time (s): (0 … 120)
Normal value 60 s

CODES

This option defines the codes for access to the different levels of changes in the stainer's parameters for 2 administrators and 4 users. (Grey icon inactive / green icon active)

ADMINISTRATOR

ADMIN1
ADMIN2

USER

USER1
USER2
USER3
USER4

To enable activation of a user code, an administrator code needs to be created first.

STATIONS

Loading Stations: 1-**2**
This defines the number of stations that will be assigned for the loading of racks on the left-hand side of the Stainer. The normal value is 2.

Unloading Stations: 1-**2**-3
This defines the number of stations that will be assigned for the unloading of racks on the right-hand side of the Stainer. The normal value is 2.

PRIORITY

In this menu, the running of staining processes can be prioritised according to **Order of entry** (order in which the racks are loaded) or **Optimized Time** (greater quantity of samples in the shortest possible time).
The default option is Starting Order. Use the arrow keys to select the desired option and then press **ENTER** to confirm.

Advanced configurations

S.A.T.

Technical Support Service
The options in this menu are reserved for the technical support service.

Programming

The two most outstanding features of the MYREVA SS-30 Slide Stainer are:

- Its ability to operate in multi-load mode.
- Its great versatility in determining operating parameters: almost all process parameters are freely configurable.

Multi-load mode

This feature enables the Slide Stainer to perform up to 5 processes simultaneously. This means that it is possible to start other staining processes (up to 5) without the need to wait for processes to finish.

This feature greatly improves the performance of the Slide Stainer, enabling it to achieve high levels of productivity.

Preparation

Before using the Stainer, the following must be prepared in advance:

- The list of reagents
- The Reagent map(s)
- The staining programme(s)

List of reagents

To facilitate the entering and documenting of programmes in the Slide Stainer, it is recommended that you create a List of Reagents to enter into the Stainer. See page 27.

This assignment of reagents is purely for illustrative purposes.

No.	*Reagent*
01	*Haematoxylin-Harris*
02	*Aqueous Eosin*
03	*Alcoholic Eosin*
04	*OG-6*
05	*EA-36*
06	*EA-65*
07	*EA-50*
08	*Xylene*
09	*Xylene Substitute*
10	*Alcohol*
11	*Methanol*
12	*Ethanol*
13	*Isopropyl Alcohol*
14	*Buffer*
15	*Tap H2O*
16	*Distilled H2O*
17	*Deionised H2O*
18	*Acid Alcohol*

No.	*Reagent*
19	*Acid H2O*
20	*Bluing Reagent*
21	*Ammonia H2O*
22	*Periodic Acid Solut.*
23	*Schiffs Reagent*
24	*Sulphite Rinse*
25	*Van GiesonStain*
26	*Alcian Blue*
27	*Perls Reagent*
28	*Leishman Stain*
29	*May Grundwald Stain*
30	*Giemsa Stain*
31	*Wright Stain*
32	*Jenner Stain*
33	
34	
35	
36	

No.	*Reagent*
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	*[Dryer]*
51	*Load (Xylene)*
52	*Unload (Xylene)*

ATTENTION!

The MYREVA SS-30 is unable to detect the type of reagent used in each station. Make sure that the programmed reagent corresponds to the ACTUAL content of the station.

Preparation of programmes

Optimising the functioning of programmes in the Slide Stainer in multi-load mode (several staining processes simultaneously) depends on several factors:

- The order of the reagents in the troughs and having several troughs with the same reagent.
- The position and quantity of rinsing troughs (water).
- The possibility that the staining processes to be simultaneously performed share the same reagents.
- Immersion times and the duration of agitation of the rack within each trough.
- Whether the immersion time is critical or not. Meaning that the sample cannot be immersed for longer than specified.

This means that, at the same time as creating staining programmes to be performed, a **Reagent map** should also be created to maximise the resources, based on the points mentioned.

The example shown here is based on two simultaneous staining programmes:

- Programme 19, TS1
- Programme 20, TS2

PROGRAMME NO.: **19** NAME: **TS1**

STEP	STATION	REAGENT	TIME	EXACT TIME	DIP MODE
1	1	Load (Xylene)	00:00	NO	0
2	3	Alcohol 100	05:00	NO	1
3	4	Alcohol 96	05:00	NO	1
4	5	Alcohol 70	05:00	NO	1
5	6	Water	01:00	NO	2
6	7	Haematoxylin-Harris	05:00	YES	1
7	8	Water	01:00	NO	2
8	9	Hydrochloric acid	00:01	YES	1
9	10	Water	01:00	NO	2
10	11	Ammoniacal	00:04	YES	1
11	10	Water	01:00	NO	2
12	12	Alcohol 96	01:00	NO	1
13	13	Eosin	00:15	YES	1
14	15	Alcohol 96	01:00	NO	1
15	17	Alcohol 96	01:00	NO	1
16	18	Alcohol 100	02:00	NO	1
17	20	Unload (Xylene)	00:00	NO	0
			29:20		

PROGRAMME NO.:**20** NAME: **TS2**

STEP	STATION	REAGENT	TIME	EXACT TIME	DIP MODE
1	2	Load	00:00	NO	0
2	4	Alcohol 96	05:00	NO	1
3	6	Water	00:10	NO	2
4	7	Haematoxylin-Harris	05:00	YES	1
5	8	Water	01:00	NO	2
6	9	Hydrochloric acid	00:01	YES	1
7	10	Water	01:00	NO	2
8	11	Ammoniacal	00:01	YES	1
9	10	Water	01:00	NO	2
10	12	Alcohol 96	02:00	NO	1
11	14	Orange	03:00	YES	1
12	15	Alcohol 96	02:00	NO	1
13	16	EA-50	03:00	YES	1
14	17	Alcohol 96	02:00	NO	1
15	18	Alcohol 100	02:00	NO	1
16	19	Unload (Xylene)	00:00	NO	0
			27:12		

The meanings of the different fields are shown below:

PROGRAMME NO. (1 … 20) The Slide Stainer's memory has capacity for up to 20 different processing programmes. Each programme must have a number from 01 to 20.

NAME (ABC) Each programme can have a three-digit identification name as a reminder of its function.

STEP (1 … 50) This column is simply a sequence of numbers to indicate the order in which the steps are executed. The programme allows up to 50 steps and there should not be any empty steps.

STATION (1 … 20) This refers to the station or trough number (1 to 20) in which each stage of the process is performed.

REAGENT (Name) This indicates the reagent contained in the corresponding trough in each station determined by the **Reagent map**.

The troughs that contain **water** have been defined during installation and cannot be freely configured (see page 12). When a water trough is selected, it should always be assigned reagent number 15.

TIME (MM:SS) This is the time in minutes and seconds that the sample remains immersed in the trough. 00:00 indicates an indeterminate time (for example, for the loading and unloading troughs).

EXACT TIME
(YES - NO - 50%)

This indicates whether the assigned immersion time is **critical** or not, that is, whether it should be accurate (accuracy +/- 1 second).

YES means that the sample may be damaged if it remains for a longer time than that indicated. This time will not be exceeded under any circumstances by the stainer.

50% means that the sample can remain immersed for a maximum of up to 50% more than the time specified without becoming altered.

NO means that the sample can remain immersed for a maximum of up to 100% more than the time specified without becoming altered.

In anticipation of optimum multi-load utilisation (5 simultaneous processes), it is not advisable to use the 'YES' option indiscriminately, but reserve it **exclusively** for **very critical** immersion times. Failure to follow this recommendation may lead to situations that hinder optimum multi-load operation.

DIP MODE
(0 - 1 - 2 - 3- 4)

This column indicates the **Dip Mode** to be used.

0 No dip
1 Dip mode 1
2 Dip mode 2
3 Dip mode 3
4 Dip mode 4

The **Dip modes**, which refer to the dip amplitude, the number of dips and the dip cycle time, can be independently configured for the reagent and water troughs (see page 19).

Note that a determining factor in the amount of time that the arm will remain occupied (agitating the rack) is also the number of dips defined in Setup > Dip > Reagent/Cleaning (see page 19). The amount of time that the rack remains in the trough takes precedence over the time resulting from the dip mode (speed x number of dips). This means that the rack can be removed from the trough without having completed the number of programmed dips.

Page 54 features a blank programming form that can be photocopied.

Reagent map

REAGENT MAP (Example)						
STATION	**REAGENT**	**REAGENT NO.**	**Programme**			
			TS1	**TS2**		
1	Load (Xylene)	51	TS1			
2	Load (Xylene)	51		TS2		
3	Alcohol 100º	33	TS1			
4	Alcohol 96º	34	TS1	TS2		
5	Alcohol 70º	35	TS1			
6	Water	15	TS1	TS2		
7	Haematoxylin-Harris	1	TS1	TS2		
8	Water	15	TS1	TS2		
9	Hydrochloric acid	36	TS1	TS2		
10	Water	15	TS1	TS2		
11	Ammoniacal	37	TS1	TS2		
12	Alcohol 96º	34	TS1	TS2		
13	Eosin	38	TS1			
14	Orange	39		TS2		
15	Alcohol 96º	34	TS1	TS2		
16	EA-50	7		TS2		
17	Alcohol 96º	34	TS1	TS2		
18	Alcohol 100º	33	TS1	TS2		
19	Unload (Xylene)	52		TS2		
20	Unload (Xylene)	52	TS1			

This **Reagent map** example shows the reagent that each trough should contain to perform programmes TS1 and TS2, the reagent number (to facilitate its inclusion when entering the programme into the stainer) and the programme that each trough uses (TS1 or TS2), thus clearly demonstrating the troughs shared by both programmes.

The **Reagent map** is closely related to the programming forms and will be a characteristic of each laboratory. Different Reagent maps can, of course, be defined to be used with different programmes.

Remember that the reagent contained in each trough must be entered into the **MAP**. See page 28
It is the responsibility of the user to ensure that each trough contains the reagent shown in the **MAP**.

Page 55 features a blank reagent map template, which can be photocopied.

Reagent and programme editing

The reagent and programme edit menu enables you to enter the information required for the operation of the stainer.

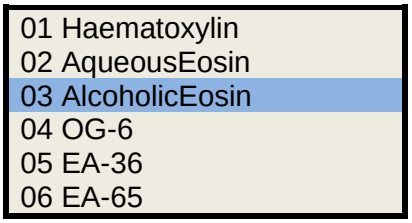
From the main menu, using the arrow keys, select **EDIT** and press **ENTER** to confirm.

Remember that it is also possible to edit the reagents and programmes with a PC and transfer them to the Slide Stainer via USB. See page 31.

Editing reagents list

Using the arrow keys, select **REAGENTS** and press ENTER to confirm.

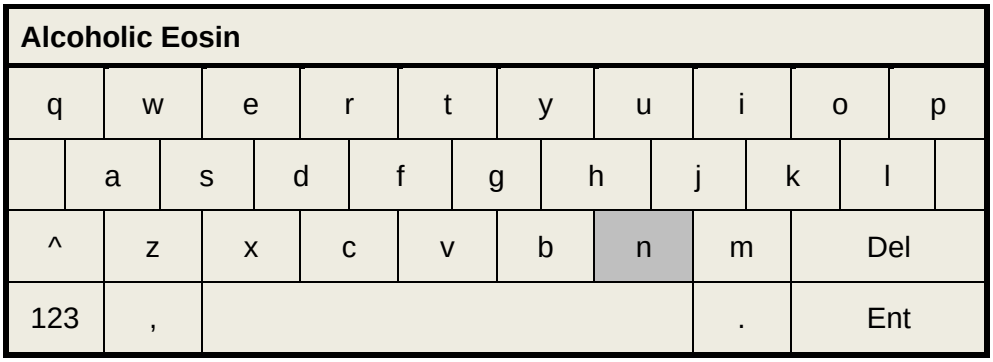
Using the arrow keys, select **EDIT** and press **ENTER** to confirm.



The numbering is fixed.
Using the arrows, select the name of the reagent that you wish to assign to each number and press **ENTER** to edit it.

Note that the **number** and **name** of the assigned reagent is for information purposes only. The correspondence between the **stations** and the **reagents** contained within them is determined by the **MAP**. See page 28

The following figure shows the appearance of the edit screen.



Navigate around the virtual Qwerty keyboard to select the letters, numbers or symbols that you wish to insert and then press **ENTER**.

On the virtual Qwerty keyboard, use “^” to select upper and lower case, “123” to access the numerical keypad and “Del” to delete incorrect entries.

Once the reagent name has been edited, select "**Ent**" and then press **ENTER** to finish editing.

A confirmation message will appear.

Save changes?
YES Enter NO Esc

Press **ENTER** again to confirm the changes. Press **ESC** to leave the edit menu without saving changes.

To delete a reagent, use the same procedure but, this time, select **DELETE**. A confirmation message will also appear.

MAP

Only **SS30H**

The **MAP** icon enables the **Reagent map** to be entered into the slide stainer.
Each station must be assigned with its corresponding reagent in the **Reagent** column. By pressing **ENTER** in each cell, a window will appear to enable you to select the reagent corresponding to the station using the vertical scroll arrows. Press **ENTER** again on the selected reagent to assign it to the station.

RMS

RMS	
Sta	Reagent
01	
02	
03	
04	
05	

RMS The Reagent Management System (**RMS**) enables you to keep track of the depletion or expiry of the reagents used.

To edit the RMS, select the **RMS** field and press **ENTER**. Use the arrows to move around the screen and set a maximum number of days, racks or both values.

RMS	Reset	Reset all				
Sta	Reagent	Changed	Days		Racks	
			Num	Max	Num	Max
01			- -	- -	- -	- -
02			- -	- -	- -	- -
03			- -	- -	- -	- -
04			- -	- -	- -	- -
05			- -	- -	- -	- -

When either of the two maximum values is reached, an alarm will sound to indicate that the reagent needs to be replaced.

After replacing the reagent, navigate to **Reset** in the top row of options using the vertical and horizontal arrows.

Press **ENTER** to select this option, go to the **Changed** column of the corresponding station and press **ENTER** to update the change date.

Update change date?	
YES Enter	NO Esc

Press **ENTER** again to confirm the changes.
Press **ESC** to exit without saving changes.

The **Reset all** option enables you to delete all of the information from the day and rack counters.

Reset counter?	
YES Enter	NO Esc

Press **ENTER** again to confirm the changes.
Press **ESC** to exit without saving changes.

Entering programmes

The programmes that were previously determined on the programming form can be entered into the Stainer by means of the display screen and keypad, or a PC connected via a USB (page 31)

To enter them with the keypad, perform the following steps.

Using the arrow keys, select **PROGRAMMES** and press **ENTER** to confirm.

Using the arrow keys, select **EDIT** and press **ENTER** to confirm.

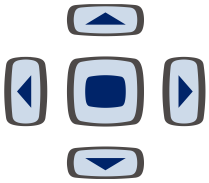
N PROGRAMME:	01
NAME:	H&E

Step	Station	Reagent	Time	Exact	Dip
01	01	Load	00:00	No	0
02	03	Alcohol 100	05:00	No	1
03	04	Alcohol 96	05:00	No	1
04	05	Alcohol 70	05:00	No	1
05	06	Tap H2O	01:00	No	2

Using the **horizontal** arrows keys, select the programme number to edit (01... 20).

Press the down arrow key to access the programme name. If you wish to modify it, press **ENTER** to access the virtual Qwerty keyboard.

Press the down arrow again to access the programme edit fields.

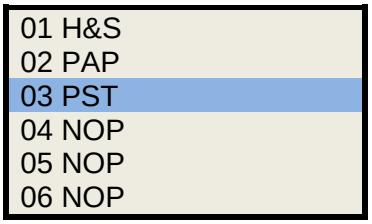


Use the arrow keys to navigate to the field that you wish to edit (highlighted in **BLUE**) and press **ENTER**. The background colour of the field that you are about to edit changes to **RED**. Use the vertical arrow keys to change the value of the field and press **ENTER** again. The field returns to being highlighted in **BLUE**.

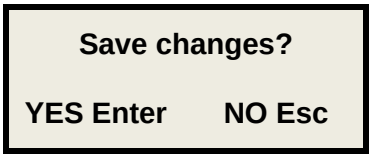
Note that, in the **Reagent** field, you must enter the **same reagent** that has been set for each station in the **MAP**. Otherwise, an error message will appear indicating that there are discrepancies between the **Programme** and the **MAP**.

DELETE

To delete a programme, select **DELETE**.
A list of programmes entered into the Stainer will appear.



Using the arrow keys, select the programme you wish to delete and press **ENTER**.
A confirmation message will appear.



Press **ENTER** to confirm the deletion of the programme.
Press **ESC** to cancel the deletion of the programme.

Remember that all programmes must always have a first step 1 (**LOAD**) and a last step (**UNLOAD**).

Programming with PC

Stainer Software is a programme designed to facilitate the programming of the SS-30 slide stainer and collect data on staining processes that have been performed.
The software enables programmes and settings to be backed up, edited, viewed, modified and printed.

Connecting the equipment

Minimum PC requirements:

- PC compatible with Windows XP or higher
- 1 free USB port
- CD-ROM
- Java 6 or higher
- USB AM/BM cable (printer type).

Connect the supplied USB cable to the slide stainer and PC. Turn on the slide stainer and PC. There may be a slight delay the first time as the necessary drivers need to be installed

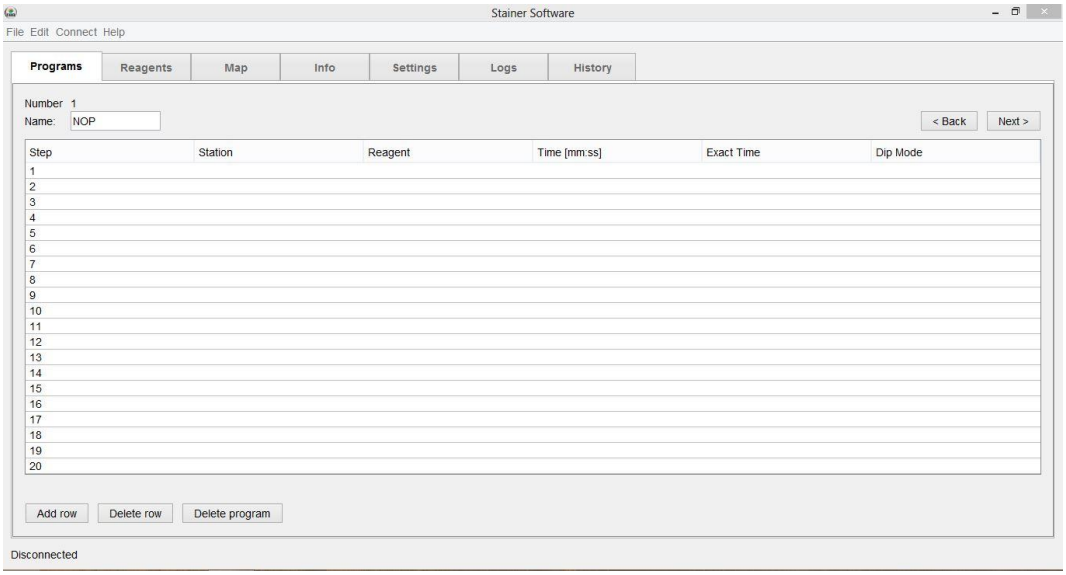
Installing the programme

Close all applications that are running before installing SLIDE STAINER SOFTWARE. Insert the USB device into the PC, find and run the file ‘StainerSoftware2.0-setup.exe’ and follow the installation instructions.

Running the software

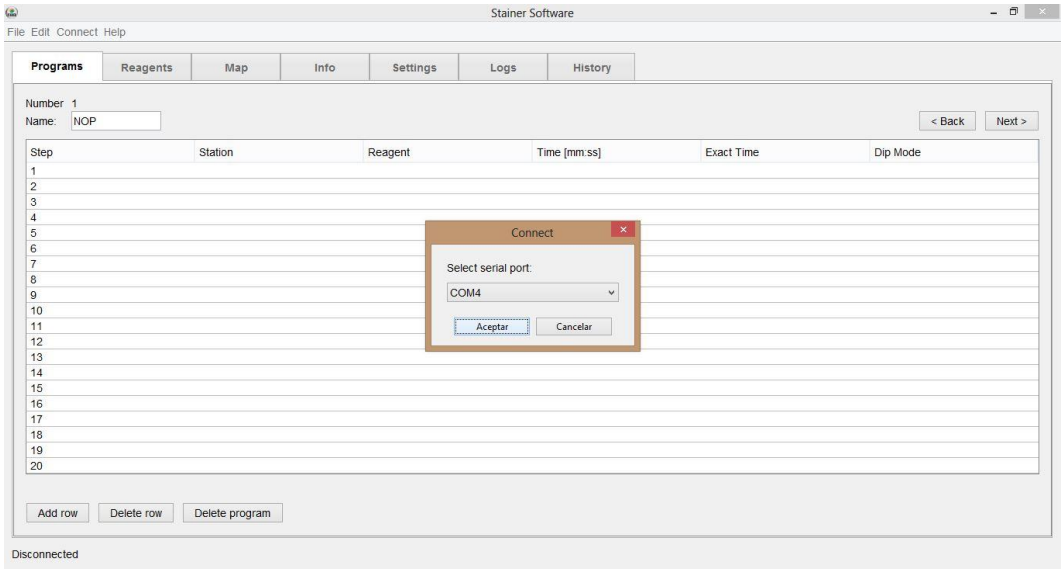
The installation programme creates a desktop shortcut.

Double-click the icon to start the programme. The following start screen appears:



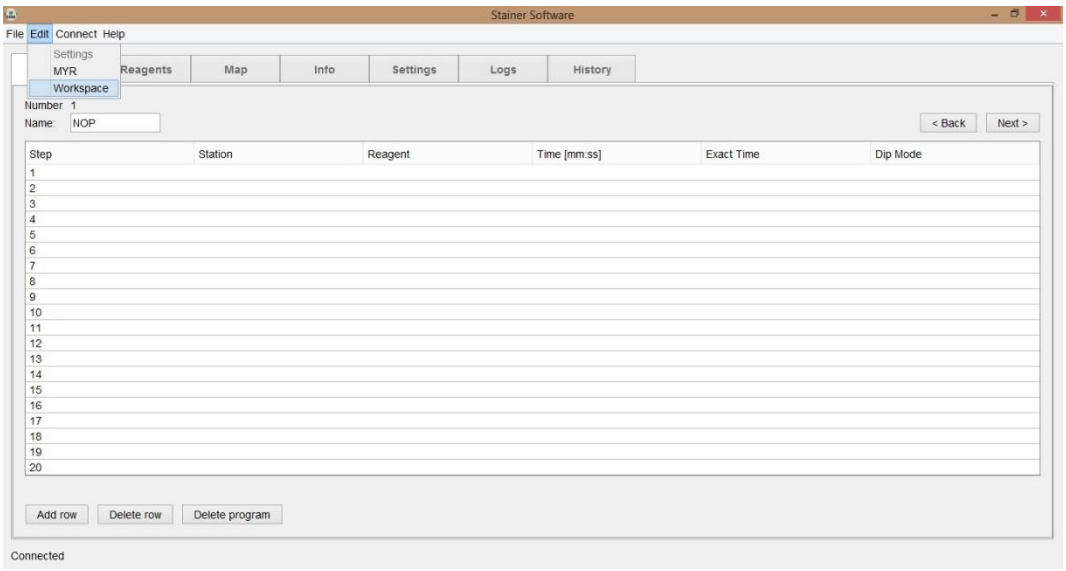
Configuration

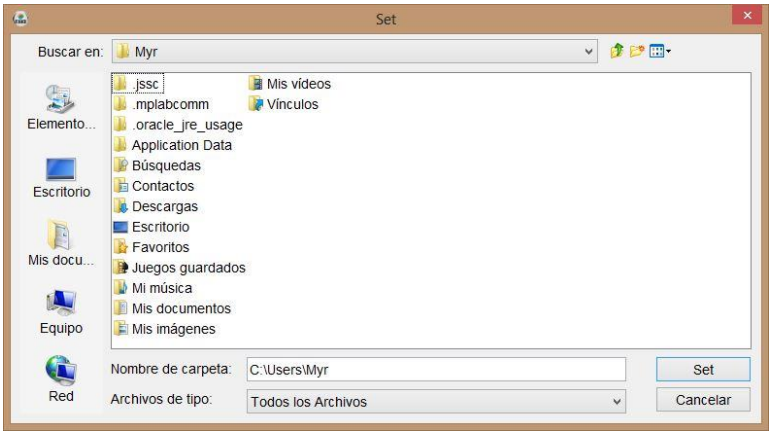
Firstly, select the COM port to which the equipment is connected. To do so, use the “Connect > Via USB” menu:



In the dialogue box that appears, select the appropriate port.

After selecting the port, determine the working directory with the “Edit > Working Directory” option. In the browser window that appears, select the directory in which the programmes and data files generated by the software will be saved.





The software automatically generates two files every day: a file with the extension ".csv" in which all staining processes performedduring the day are saved and a file with the extension ".log" which contains any errors and alarms logged by the equipment.

File menu

The File menu features the following options:

New This initialises all programmes and tables, and shows the settings with the default values

Open This opens a file with the extension .myr containing programmes, reagents and settings.

Save This saves programmes, reagents and settings in a file with the extension .myr

Read This reads the machine's programmes, reagents and settings. (Active only in Connected mode).

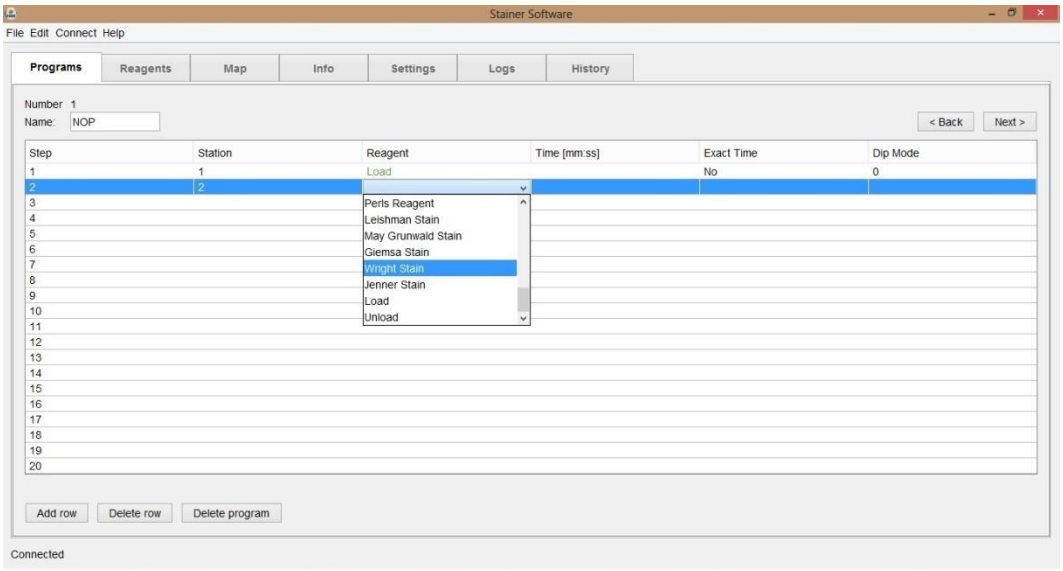
Write This writes the machine's programmes, reagents and settings. (Active only in Connected mode).

Write Flash After a confirmation message, this writes the programmes, reagents and settings that are already in the machine's flash memory. (Active only in Connected mode).

Print This prints programmes, settings, info and logs

Quit This closes the programme.

Creating a programme



From the Programs tab, it is possible to create or modify programmes. The fields need to be filled in by selecting the options in the dropdown menus (Station, Reagent, Time, Exact Time and Dip Mode), as specified for each process.

At the bottom of the screen, there are three buttons with the following functions:

Add Row This adds an empty row at the end of the table up to a maximum of 50 rows.

Delete Row This deletes the selected row from the table down to a minimum of 3 rows.

Delete Programme This initialises the programme and establishes the 20 default rows.

ATTENTION:
As each station has a reagent already assigned (see **MAP** on page 28), when programming each station, the **same reagent** as indicated in the **MAP** must be entered.
Otherwise, an inconsistency error will appear during the running of the programme.

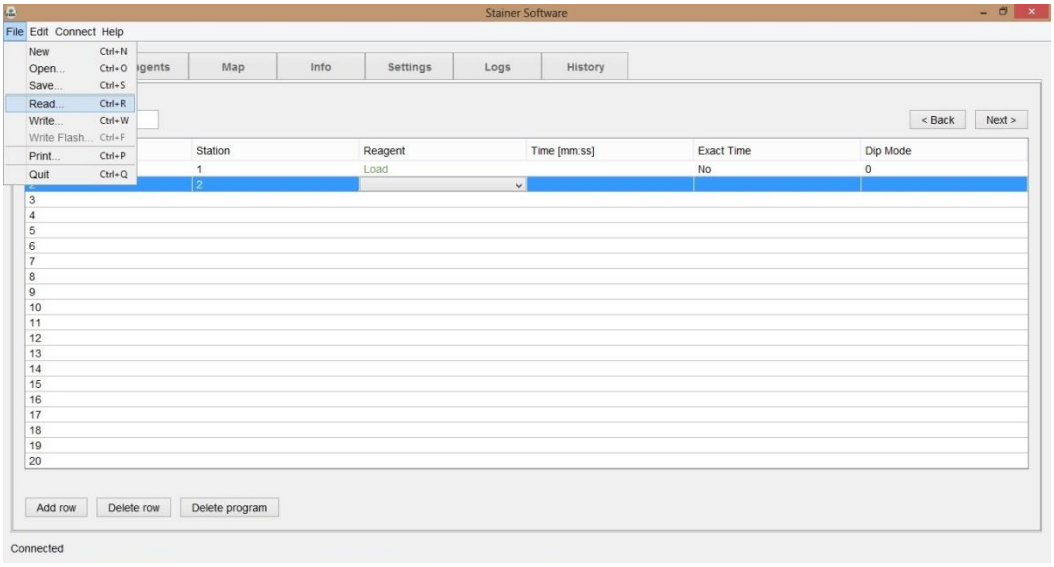
The programme's reagent(s) does not match the configuration Continue?

YES Enter NO Esc

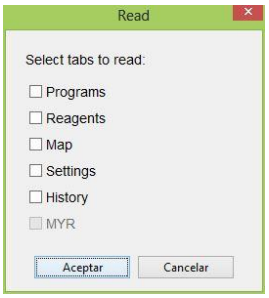
Press **ENTER** to accept the inconsistency and continue.
Press **ESC** to interrupt the running of the programme and resolve the inconsistency.

Reading and writing programmes

To read the slide stainer's programmes when it is connected to the PC, select the option "File > Read...".

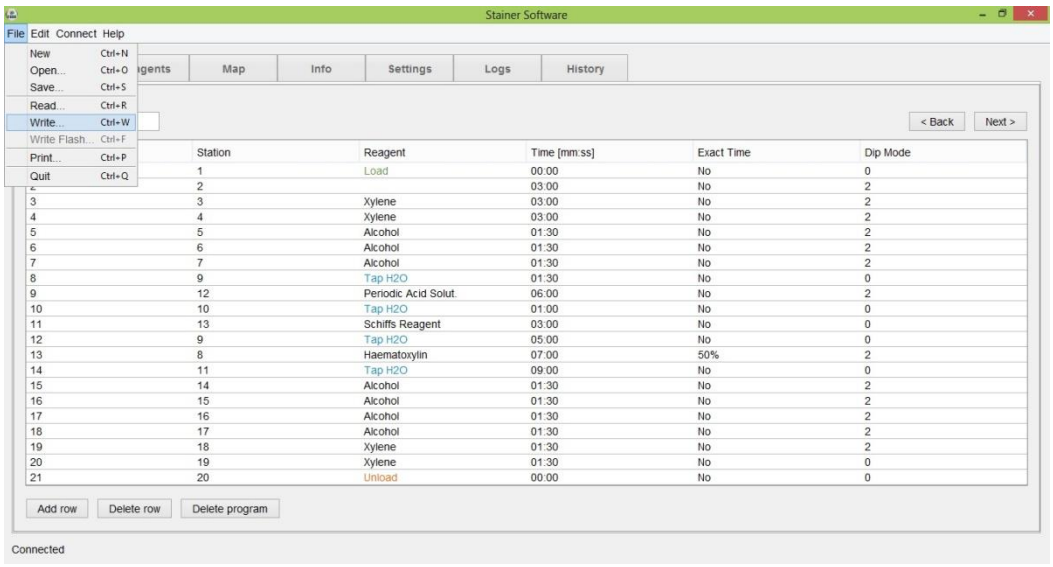


In the popup window that appears, select what is going to be read. *(Programmes and reagents are always associated).*

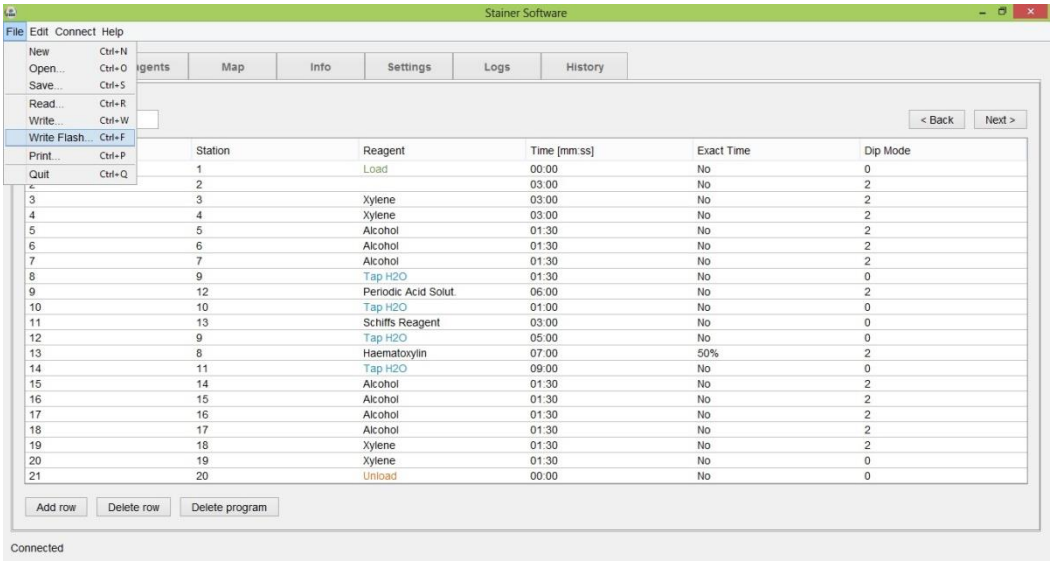


By clicking OK, all data received from the slide stainer appears on screen. At this point, it is possible to generate a backup file with the extension ".myr" and save it in the "File > Save..." menu so that it can be recovered at a later date if necessary.

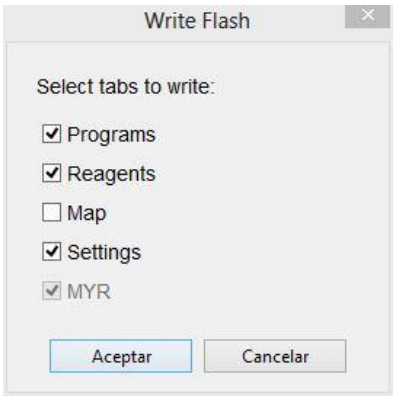
The writing process is quite similar. Once a new programme has been created, modified or recovered from a previous file, and with the slide stainer connected to the PC, select "File > Write...". In the popup window, select what you want to write and confirm by clicking OK.



Once writing is complete, everything transmitted will appear in the slide stainer. This first writing is temporarily stored in the volatile memory of the equipment to enable the user to check that it is correct. This means that if the slide stainer is turned off and then on, the stored information will be lost. To confirm the writing and definitively save it in the slide stainer, it needs to be written again with “File > Write Flash...”.



And, in the popup window, confirm the writing in the Flash memory.



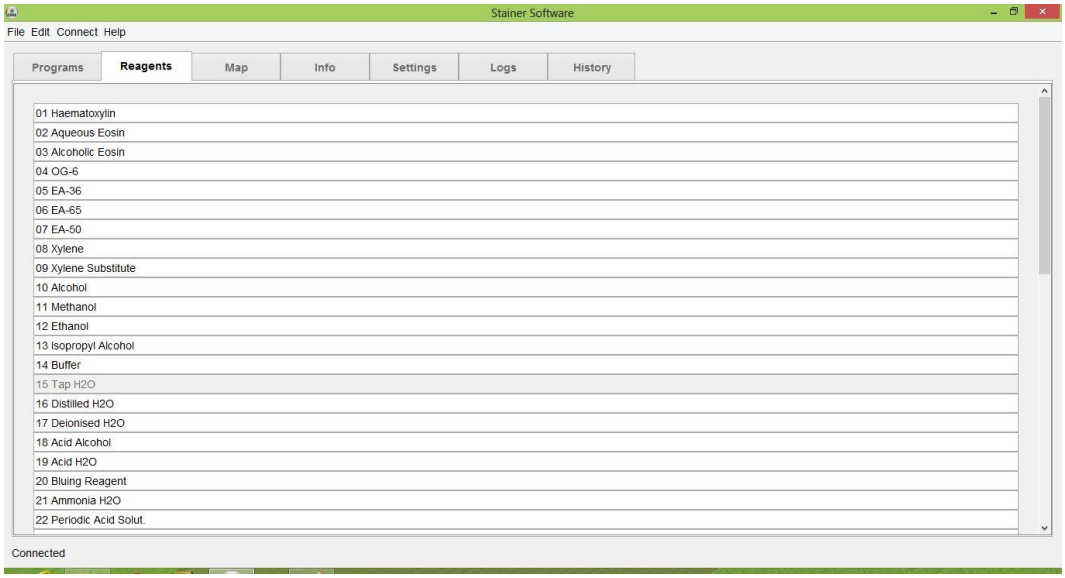
Once confirmed, it remains stored even if the slide stainer is turned off.

Reading and writing reagents

32 default reagents appear in the programme, and these are the same as those that appear in the machine. All reagents can be edited, **except number 15**, which, as previously mentioned, is reserved to indicate the washing stations.

The functioning of the reading / writing is exactly the same as that for programmes.

Remember that the reagents are always linked to the troughs.



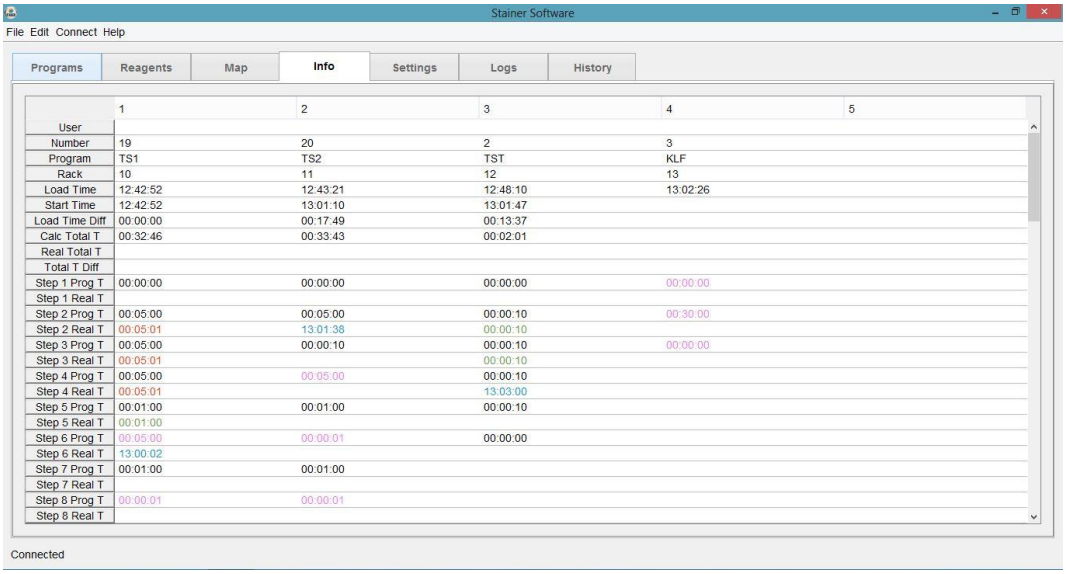
At the end of the list, two buttons, “Refresh” and “Reset”, appear with the following functions:

Refresh It updates the list of reagents in the dropdown menu of the “Programs” tab.

Reset This initialises the list of reagents to the 32 default reagents.

Tabs “Info, Settings and Logs”

Info This tab enables the user to view processes running in real time



	1	2	3	4	5
User					
Number	19	20	2	3	
Program	TS1	TS2	TST	KLF	
Rack	10	11	12	13	
Load Time	12:42:52	12:43:21	12:48:10	13:02:26	
Start Time	12:42:52	13:01:10	13:01:47		
Load Time Diff	00:00:00	00:17:49	00:13:37		
Calc Total T	00:32:46	00:33:43	00:02:01		
Real Total T					
Total T Diff					
Step 1 Prog T	00:00:00	00:00:00	00:00:00	00:00:00	
Step 1 Real T					
Step 2 Prog T	00:05:00	00:05:00	00:00:10	00:30:00	
Step 2 Real T	00:05:01	13:01:38	00:00:10		
Step 3 Prog T	00:05:00	00:00:10	00:00:10	00:00:00	
Step 3 Real T	00:05:01		00:00:10		
Step 4 Prog T	00:05:00	00:05:00	00:00:10		
Step 4 Real T	00:05:01		13:03:00		
Step 5 Prog T	00:01:00	00:01:00	00:00:10		
Step 5 Real T	00:01:00				
Step 6 Prog T	00:05:00	00:00:01	00:00:00		
Step 6 Real T	13:00:02				
Step 7 Prog T	00:01:00	00:01:00			
Step 7 Real T					
Step 8 Prog T	00:00:01	00:00:01			
Step 8 Real T					

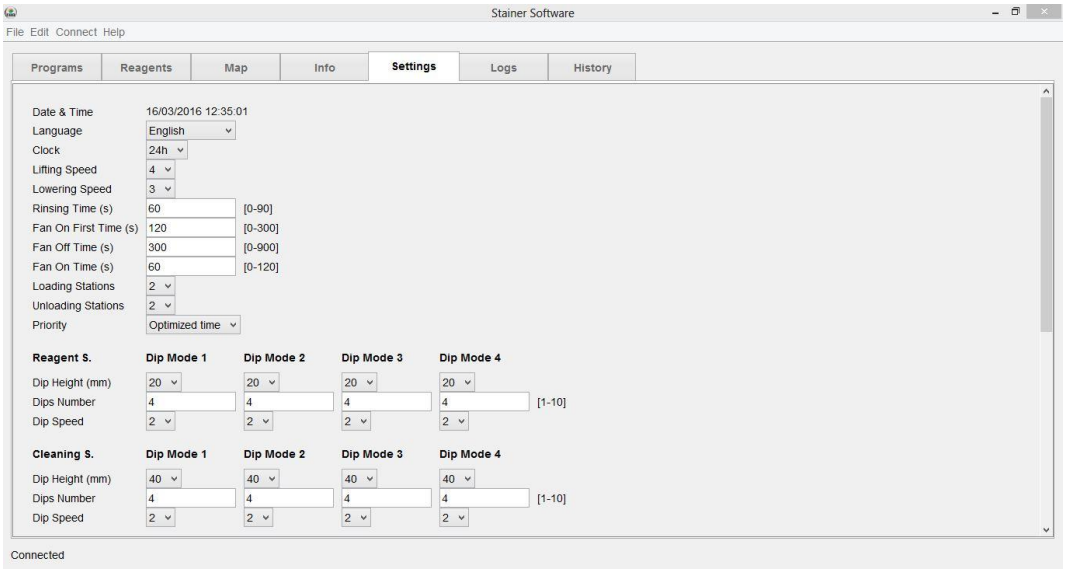
Each rack is shown in a column, indicating:

- Programme no.
- Programme name
- Loading time
- Programme start time
- Difference between the loading and start time
- Total time estimated by the equipment
- Actual total duration of the programme
- Difference between the estimated and actual time
- Programmed time in each step
- Actual time that the rack remains in each step

The colour codes for the times are as follows:

Black: Programmed times.
Pink: Time programmed as critical.
Green: Time correctly completed.
Red: Programmed time exceeded.
Blue: Time at which the rack enters the trough (the trough in which it is situated at that moment changes when it comes out).

Settings This tab lists all of the machine's programmable settings



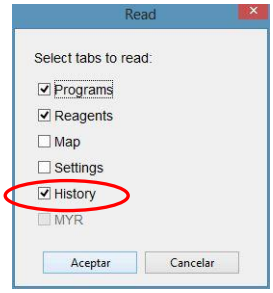
From here, it is possible to modify/read/save all of these settings.
The date and time are synchronised with the PC when it is connected to the slide stainer.

Logs In this tab, all alarms that have appeared in the equipment are logged.

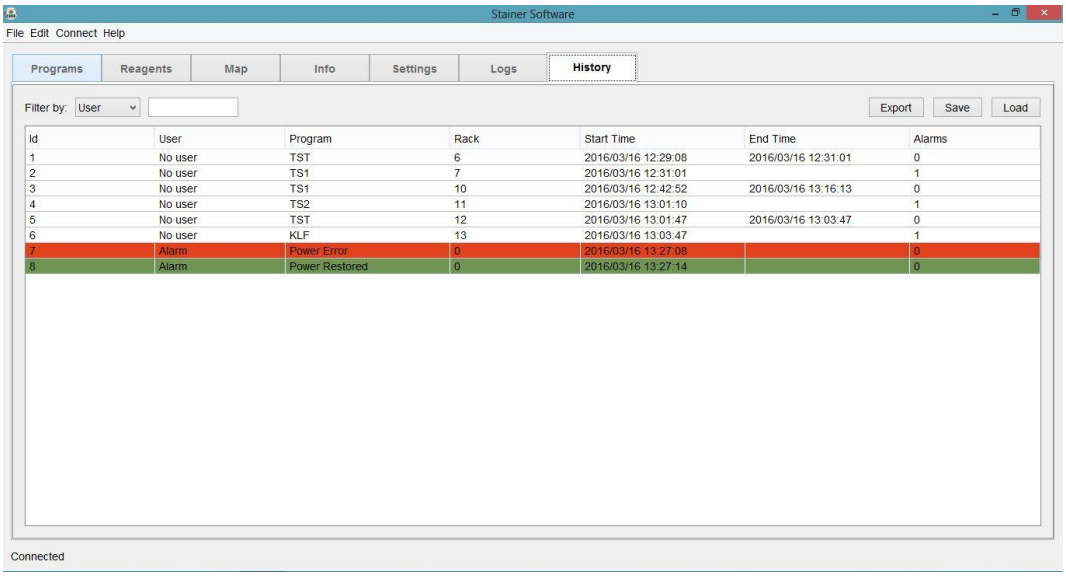
"History" tab (Only SS-30H)

This tab allows you to view and save to your computer all historical data accumulated by the slide stainer since the last reset.

You firstly need to download the slide stainer's historical data to your computer. To do so, mark the "History" tickbox in the "File > Read" menu (see page 33).



When you click the “History” tab, the following screen will appear:



The first column, “Id”, shows a consecutive numbering of the events produced. The following columns provide more information about each event.

Filter by: This option allows you to filter data by User, Programme, Rack, etc.

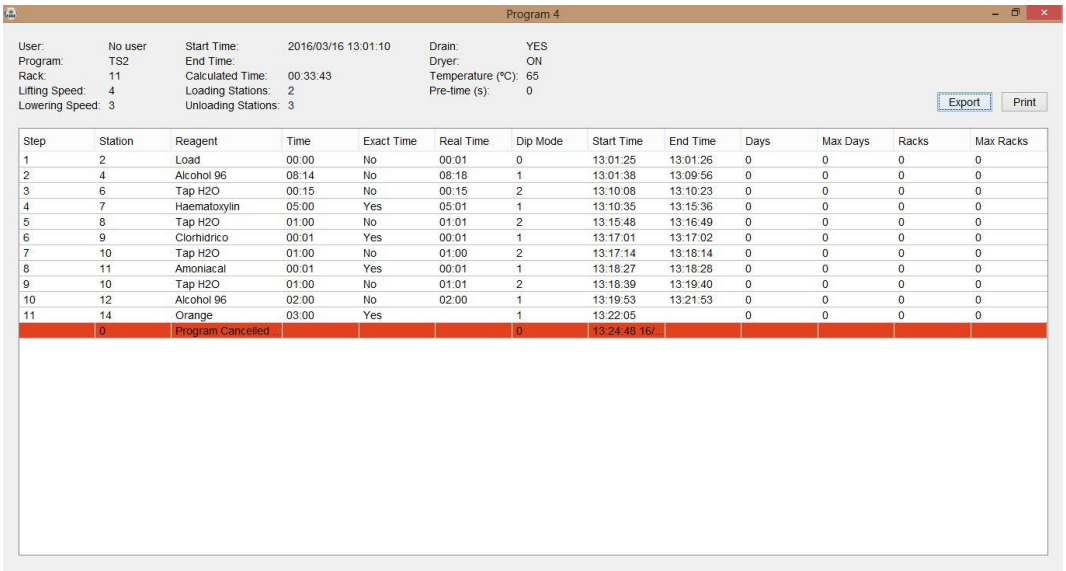
Export Enables you to export the data shown on screen in “.csv” format for subsequent processing.

Save Saves the data in a “.h2.db” format file for subsequent viewing.

Load Loads the data from a previously saved file.

To view further information about a particular event, click the corresponding row.

In this example, the event Id=4 has been selected (No user, Program TS2, Rack 11).



This magnified screen shows all of the details of the event.

Export Enables you to export the data shown on screen in ".csv" format for subsequent processing.

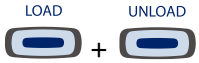
Print Prints the data displayed on the screen to a local or remote printer connected to the computer.

Deleting the "History" (Only SS-30H)

Important
Historical data is stored in the slide stainer's memory

Make sure you read the history and save the data to your computer before deleting the slide stainer's historical data.

Delete To delete the slide stainer's historical data:



1. Turn off the slide stainer's main switch (see page 11).
2. Hold down the "Load" and "Unload" keys at the same time.
3. Turn on the slide stainer's main switch.
4. Release the "Load" and "Unload" keys.

Historical data is stored in the slide stainer for approximately 30 days, depending on the number of hours of operation and programmes run.

When the slide stainer's historical data memory is full, the oldest data is overwritten.

Running a process

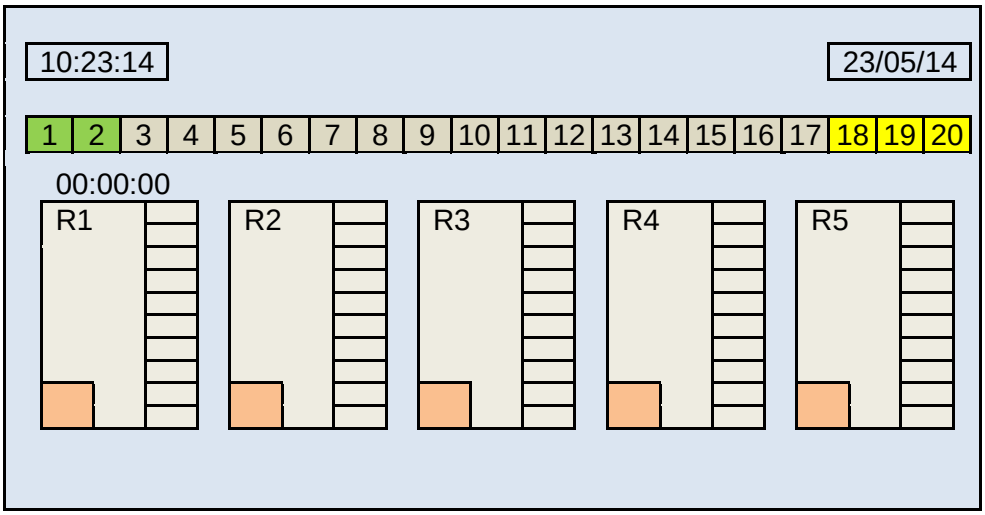
On page 13, it is recommended that you perform some assays without samples or reagents to familiarise yourself with the device. Perform the checks that are shown, carry out some test processes to verify the programmes **before filling the troughs** with reagents and run processes with real specimens.

For the tests, you can use programmes with non-critical times of 01:00 (one minute) per stage, respecting the critical times, e.g. 00:01 for the troughs that contain hydrochloric acid or ammoniacal. This will help you to familiarise yourself in a little over 10 minutes with processes that in reality take more than 30 minutes.

Loading procedure

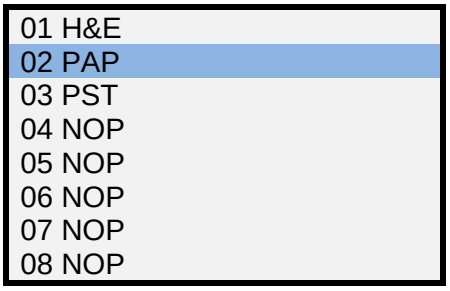
Press ESC to return to the main menu.

Using the arrow keys, select the **STAIN** option and press **ENTER** to confirm. The monitoring screen appears showing the status of the staining programmes.



If no process is in progress, you can choose to enable/disable the drain function by pressing **DRAIN**. The screen will show the word **DRAIN** as shown on page 45.

Press **ENTER** again. A screen appears with a list of programmes previously entered into the stainer.



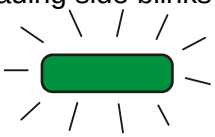
Select the name/number of the programme that you wish to run and press **ENTER** to confirm.

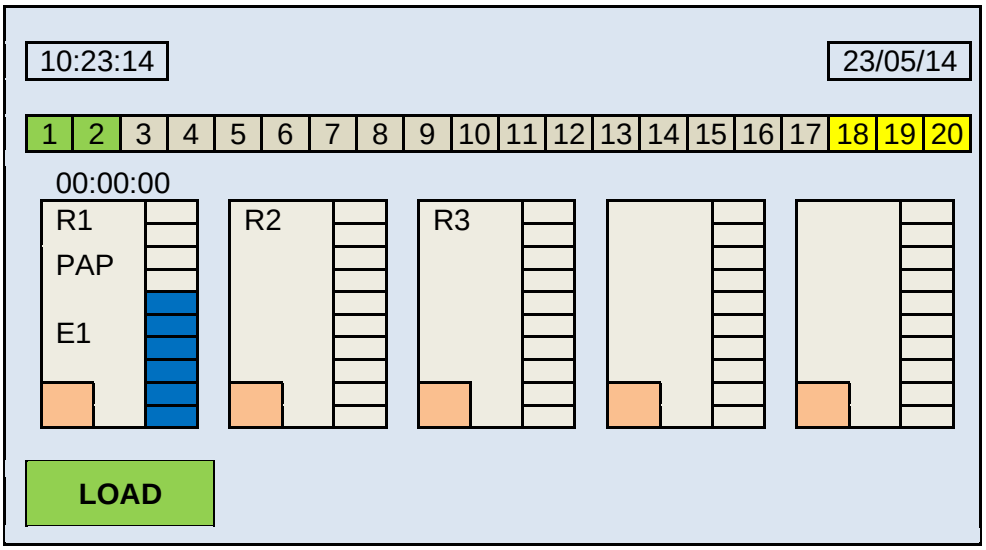
These instructions must be followed carefully since the processor can only obtain its information if the key presses confirming the loading and unloading operations performed are made in the correct order.

For your safety, do not lift the loading or unloading doors when the indicator light is RED. Wait for the light to turn GREEN before lifting the door and placing the rack in the trough.

Once the programme number has been confirmed, the instruction **LOAD flashes** on the screen and the indicator light on the loading side blinks **GREEN**.

The indicator light on the loading side blinks





LOAD flashes ►

Press the **LOAD** key

Red pilot light

If the indicator light is illuminated **RED**, wait before you lift the door to load the rack.

Green pilot light

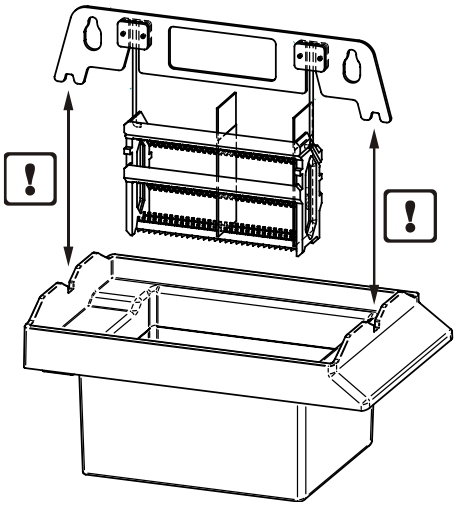
When the **GREEN** indicator light stops blinking, open the loading door and place the rack in the trough (station) indicated by the screen.
S1 and S2 refer to Stations 1 and 2 respectively.

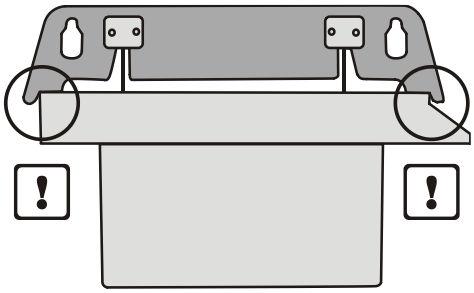
The Stainer may suggest that you use a different trough to the one programmed in order to optimise the processing time.

This message only appears when two loading troughs have been programmed.

You can accept the newly-suggested trough if both loading troughs contain the same reagent.

Make sure that the rack **fits perfectly into the notches of the trough**, otherwise the robotic arm will not collect it properly and a collision will occur.





LOAD

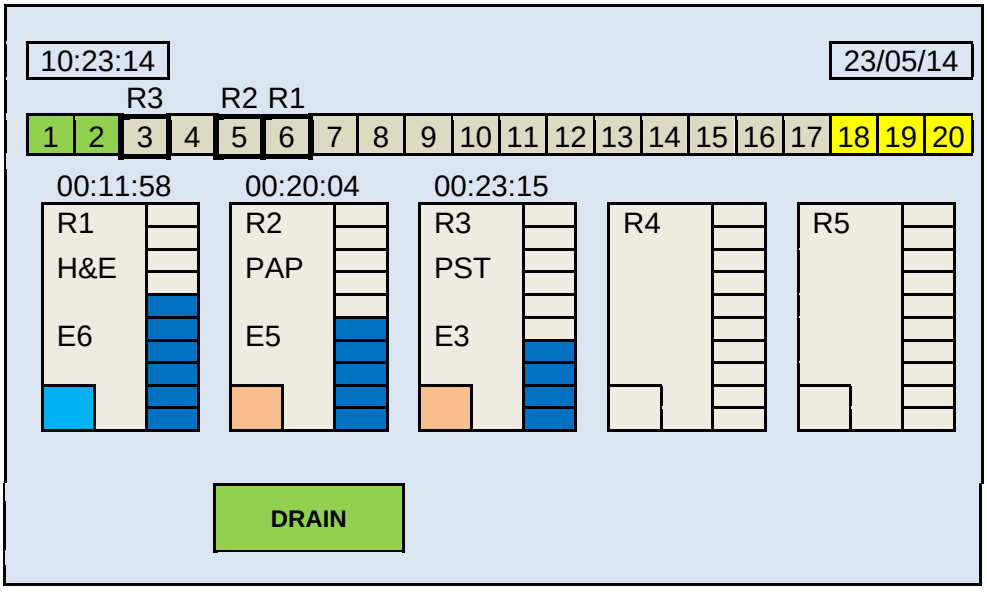
Once the rack has been placed into the corresponding trough, close the loading door and press **LOAD** again **to confirm** that the loading operation has been completed.

The **GREEN** indicator light goes out and the **LOAD** message disappears.

Monitoring the process

The screen shows an example of how monitoring of the processes is displayed in the Slide Stainer.

This example shows 3 staining processes in multi-load mode.



At the top, the current time and date are displayed.

SS-30: R1, R2, R3, R4 and R5 are the numbers of the racks.
SS-30H: Racks are numbered R1, R2, R3, R4, R5 ... up to R99. Every day, at 00.00, the numbering resets in order to avoid repetition in the identification of the racks (memory register).

The line of squares (1 to 20) indicate the stations:

Green:	*Loading station*
Yellow:	*Unloading station*
Red:	*Drying station (only SS-30H)*
Highlighted squares:	*Stations containing racks. The rack number is displayed above. In the example, R3, R2 and R1.*

The status of each of the 5 racks is displayed:

Top:	*Time remaining to complete the process in HH:MM:SS.*
H&E, PAP, PST:	*Programmes that are running in each rack.*
S6, S5, S3:	*Station where the rack is located. The colour of the box in the lower left-hand corner shows the contents of the tray in the corresponding station:*
Green:	*Loading station*
Blue:	*Station with water trough*
Pink:	*Station with reagent trough*
Yellow:	*Unloading station*
Red:	*Drying station (only SS-30H)*

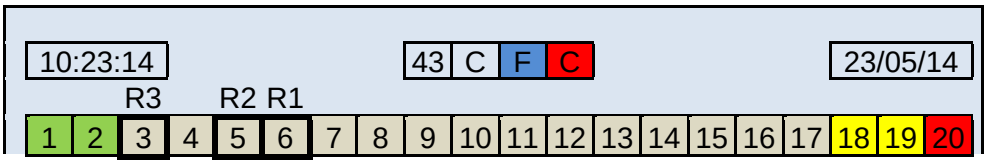
The blue rectangular boxes on the right indicate the percentage of the process completed. In the example, rack 1 is at 60%, rack 2 at 50% and rack 3 at 40% of the processing time.

The **DRAIN** box is enabled/disabled with the **DRAIN** key and indicates the state of activation of the draining operation when the arm has lifted the rack from the station.

The enabling/disabling of this option is only possible when no staining process is underway.

* In the SS-30H, the status of the drying station appears here (if previously activated):

SS-30H



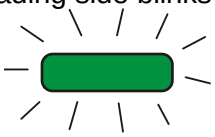
Display differences compared to the SS-30 slide stainer:

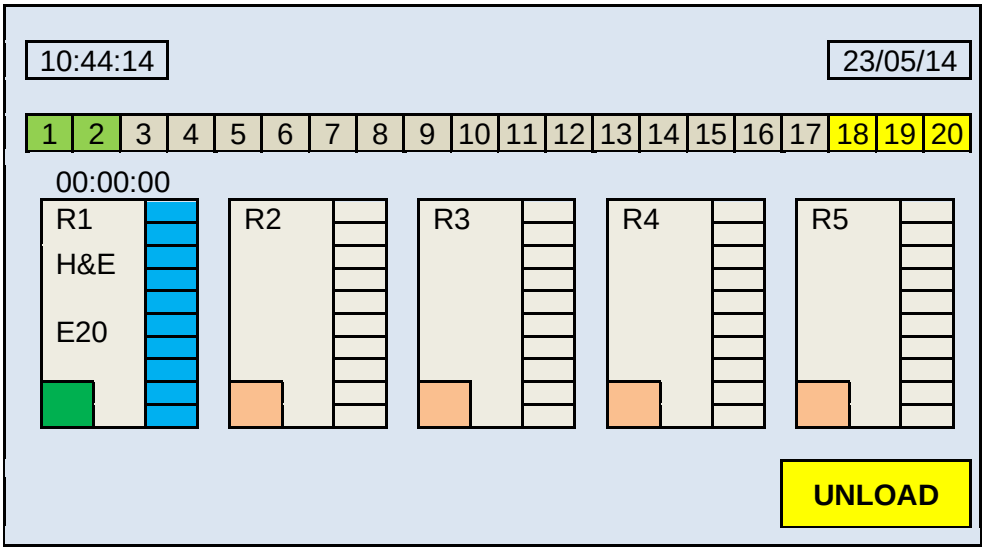
- *The first box of the group in the middle indicates the actual temperature of the drying station (43 in the example).*
- *The second box indicates the temperature scale used (C/F)*
- *The third box, marked with an F, indicates that the heater fan is operating.*
- *The fourth box, marked C with a red background, indicates that the heater's resistors are activated.*
- *Station 20 is shown in red.*

Unloading procedure

On completion of a rack staining process, the device beeps intermittently and the indicator light on the unloading side blinks **GREEN**.

The indicator light on the unloading side blinks





UNLOAD flashes ►

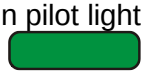
In the example, rack R1, which is located in station S20, has completed 100% of the process and requires unloading.
The **UNLOAD** message **flashes**.

Press the **UNLOAD** key.

Red pilot light

If the indicator light is illuminated **RED**, wait before you lift the door to unload the rack.

Green pilot light



When the **GREEN** indicator light stops blinking, open the unloading door and remove the rack from the trough (station) indicated by the screen.
S18, S19 and S20 refer to stations 18, 19 and 20 respectively.

Once the rack has been removed from the corresponding trough, close the unloading door and press the **UNLOAD** key again **to confirm** that the unloading operation has been performed, otherwise the device will freeze and emit an error message.

The **GREEN** indicator light goes out and the **UNLOAD** message disappears.

Alarm and attention messages

Here is a list of the alarm and attention messages that can appear during the staining process.

Time exceeded in Rack XX St. XX	This indicates that the immersion time (programmed + extra) of the rack (1 ... 5) and in the trough (1 ... 20) has been exceeded. The message disappears by pressing the **ENTER** key. This can occur when the unloading troughs are full and more staining processes are in progress and awaiting completion. Check the immersion time assigned in the programme.
Program abort?	This confirmation message appears after pressing the key to interrupt a staining process. Press **ENTER** to confirm or **ESC** to cancel.
Low battery	This indicates that the battery level is lower than 20% of its full charge. Turn off the instrument with the power switch and complete the staining process manually. Turn on the device and check that it has power. If, even after restoring the main power, the message remains, contact your technical support service.
Communication Error	This message may appear if there is no internal communication between the slide stainer's control circuits. Restart the slide stainer to restore communication. Contact your distributor for technical support.
Station X Load?	This message appears when the stainer detects that loading to a different station to that which has been programmed (1 or 2) would better optimise the time. This message only appears when two loading troughs have been programmed. You can accept the newly-suggested trough if both loading troughs contain the same reagent.
Unload and Enter	This appears when the unloading troughs are full and another process is awaiting unloading. Unload the racks to release the unloading trough(s) and press **ENTER** to continue the current process.
Mechanical Error	This appears when a mechanical problem is detected. Find the problem and try to solve it. If you cannot solve the problem, inform your technical support service.
Valve Security Stop	This appears when the safety sensor detects an excess of water due to a blockage in the drain. The message disappears when the problem has been solved.
Valve Emergency Stop	This appears when the safety sensor in the bottom tray detects the presence of liquid due to trough overfilling or overturning, or a problem with the water supply. The message disappears when the problem has been solved.

Filter time expired	This appears when the machine is switched on and every day at 12:00 when the useful life of the activated carbon filter has expired. The message disappears when the filter has been replaced and the filter usage time reset. (See p. 21)
Drying station	Sensor error Fan error Resistance error

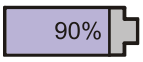
Battery operation

The MYREVA SS-30 Slide Stainer is equipped with a backup battery in case a power failure occurs during operation.

Only batteries approved by the manufacturer are permitted to be used. The use of batteries not approved by the manufacturer renders the warranty invalid.

In the event of a power failure, the illumination of the window located on the lower left-hand side with the Myr logo will go out. The device will continue to operate for a period of about two hours.

SS-30H If you use the **SS-30H** slide stainer with the drying station activated, note that the heating system is switched off during battery operation due to its high energy consumption.



At the bottom of the display screen, a battery symbol will appear indicating its charge percentage.

In the event of a power failure, we recommend waiting for an hour before starting new staining processes.

If you anticipate that the power failure will be prolonged, we recommend that you terminate all processes, turn off the device with the power switch and replace the protective covers to prevent reagent evaporation.

When the power supply is restored, the Stainer will return to normal operation and the battery will automatically start charging.

Maintenance

Routine maintenance

To secure optimum performance of the instrument, it is recommended that a routine maintenance be performed by a trained service technician once a year.

It is highly recommended to replace the troughs every 2 years of standard use.

Cleaning

DANGER
In the event of a major spillage of reagents, switch off and disconnect the unit from the mains supply immediately and dry it carefully. Before starting again, check that no parts of the robotic arm have been in contact with the spilled fluid. In case of doubt, have the unit checked by a service engineer before further use.

CAUTION
Only the listed reagents (see page 22) are suitable for use in the Slide Stainer.

The use of any other reagent will be the responsibility of the user.

- Reagents are to be disposed according to the lab specifications.
- Solvents (reagents) that have been spilled over the instrument should be cleaned immediately. Otherwise, the surface may be affected.
- Coated surfaces and display area are resistant neither to xylol nor to acetone.
- Do not use alcohol, cleaning agents containing alcohol (i. e. glass cleaners), abrasives and solvents with acetone or xylol to clean the unit.
- Hood, display and housing should be cleaned with conventional mild cleaning agents.
- When using cleaning agents, the security advices of the manufacturer and the security regulations of the country where the instrument is operated should be observed.
- When operating or cleaning the instrument, no liquid should contact the electrical connections or the inner part of the instrument.

DO NOT USE Xylene, Toluene, Benzene, chlorinated solvents or other products incompatible with Polysulfone to clean optical level sensors. These products can attack the material of its housing. The use of alcohol-based solvents is highly recommended.

If reagents are accidentally spilled on optical level sensors, they must be dried immediately.

Please observe these instructions when cleaning the instrument:

- Switch off and unplug the unit from the main power before cleaning.
- Open the fume hood and remove all reagents troughs.
- Pour and clean them.
- Reagents and water troughs may be cleaned in the dishwashing machine.

Wash the reagent troughs and water trough in the dishwashing machine at max. +45 ºC.
Neutral washing agents can be used.

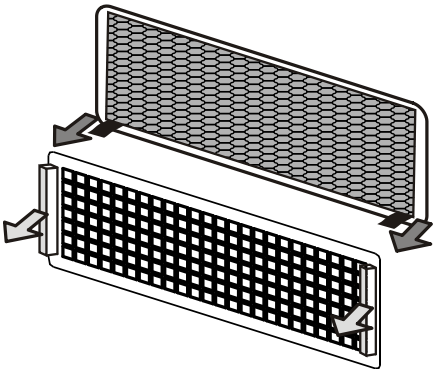
- The stations **should never be washed** at higher temperatures (i.e., using industrial dishwashing machines that work at **+85 ºC**) to avoid deformations.
- The hood and the coated pieces of the housing should be cleaned with a mild cleaning agent.
- Check for the presence of dirt in the drain hose and clean it regularly.

Replacing the filter

When the display screen shows the following message:

Filter time expired

It is necessary to replace the filter and *reset* the Programed Time (see page 21).



The grill that covers the filter is attached with magnets. Pull it away from the magnets by the handles.

Remove the filter by pulling on the two tabs in the bottom corners.

Replace the filter with a new one and discard the used filter following the laboratory's established rules.

Do not throw the filter out with the rubbish!
It contains toxic and flammable products that must be disposed of properly.

It is essential to replace the filter at the end of its useful life because, as well as causing unpleasant odours, a clogged filter can represent a fire hazard.

Disposal of the instrument after final shutdown

Separate taking back of electrical and electronic instruments in the European Union countries:

This is to be applied in the countries of the European Union and other European countries with a separate collecting system within the waste management.
This product, being an electro and/or electronic instrument, must be treated separately within the waste management process (WEEE).

For non-European Union countries, the disposal of the instrument after final shutdown must be done according to local laws in force

Replacement part codes for the SS-30 slide stainer

SS30-032	Power supply
SS30-033	“D” power cable (European)
SS30-034	“C-J” power cable (USA)
SS30-035	“ST-BUF5A” power cable (UK)
SS30-043	Activated carbon filter (5-unit pack)
SS30-049	Trough water inlet fitting (includes 1 m Ø6 mm tube)
SS30-050	Reagent trough
SS30-051	Water trough
SS30-054	Individual reagent trough cover
SS30-055	Stainless steel reagent trough cover set
SS30-056	Water supply hose (1.5 m)
SS30-056A	Water supply hose (2 m)
SS30-057	Corrugated drain hose (3 m)
SS30-058	Stainless steel clip for drain hose
SS30-059	Rack holder
SS30-060	Plastic rack for 30 slides
SS30-102	User manual (includes PC software CD)
SS30-103	Spirit level
SS30-104	Tube cutter for Ø6 mm tube
SS30-105	USB cable for connection to PC

Technical Service

Contact your distributor

Programming form

PROGRAMME NO.: NAME:

STEP	STATION	REAGENT	TIME	EXACT TIME	DIP MODE
1					
2					
3					
4					
5					
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7					
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39					
40					
...					

Reagent map

STATION	REAGENT	REAGENT NO.	Programme			
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

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