SFS8000

Controller for softener and filter plants

The screen shows:

- FLF 0,0 l/h
- PRF 0,0 kPa
- 45% Service (1) — SV1
- 95% Service (2) — SV2
- 100% Standby — SV3
- 100%
- WM 64000,0 l
- 50%
- AP1
- Menu
- Alarm
- Start : Vol: 9,0 m3
- We 09:22

SFS 8000

Operating manual

Software version 1.01

Contents

1. System description

1.1. General

The SFS8000 is applicable for the automatic control and monitoring of softener and filter units. Thanks to the flexible programmable software this controller is suitable for a large number of various water treatment applications.

1.2. Functionality overview

- Menu-driven operating and programming of controller graphic colour TFT display (800x480).
- Operates via touch panel.
- Choice of languages.
- Universally applicable to softener and filter plants.
- Flexibly programmable for specific user requirements.
- Softened water production via manual controls or level switches
- Free programmable service telephone number.
- Programming locally and via web browser
- Schematic diagram via web browser
- Modbus compatible protocol through RS485 and Ethernet.
- Measurement data logging via RS232, RS485 and SD card.
- Alarm logging via RS232, RS485, SD card and E-mail.
- 8 free programmable inputs for potential free switches.
    Available input functions: High-level switch, Low-level switch, Wait, Regeneration Start, alarm reset, water meter, security switches for valves / pumps and Level switch for brine tank
- 14 free programmable relay outputs
    Available relay functions: Multiport valve, Service valve, Single valve, Additional Program, Regeneration, Flush, Alarm, High-pressure pump.
- Optional : relay circuit board with 7 relais outputs for e.g. 3rd filter
- Optional: 2 x print with 3 outputs 0(4)-20mA for writer.
- Optional: 4 prints with :
    3 programmable inputs 0-20mA :
        Available measuring functions: Level of the clean water tank, level of brine tank, Flow measurements, Pressure measurements..
- Alarm history: last 20 alarms are stored with date and time
- Update of software via SD card
- Date and time with battery
- Securing program information in the event of a loss of voltage, the program information is stored without battery.
- Manufactured according to EMC guidelines.
- Casing suitable for wall mount, mounting and _panel_ mounting.
- Available in 24V, 115V, 230V, 240V, 115/24V, 230/24V, 240/24V

1.3. Diagram of the unit

The unit is schematically represented in the following diagram
The diagram features all the components defined in the controller. Only the components that are
connected to the available in- and outputs can be displayed.
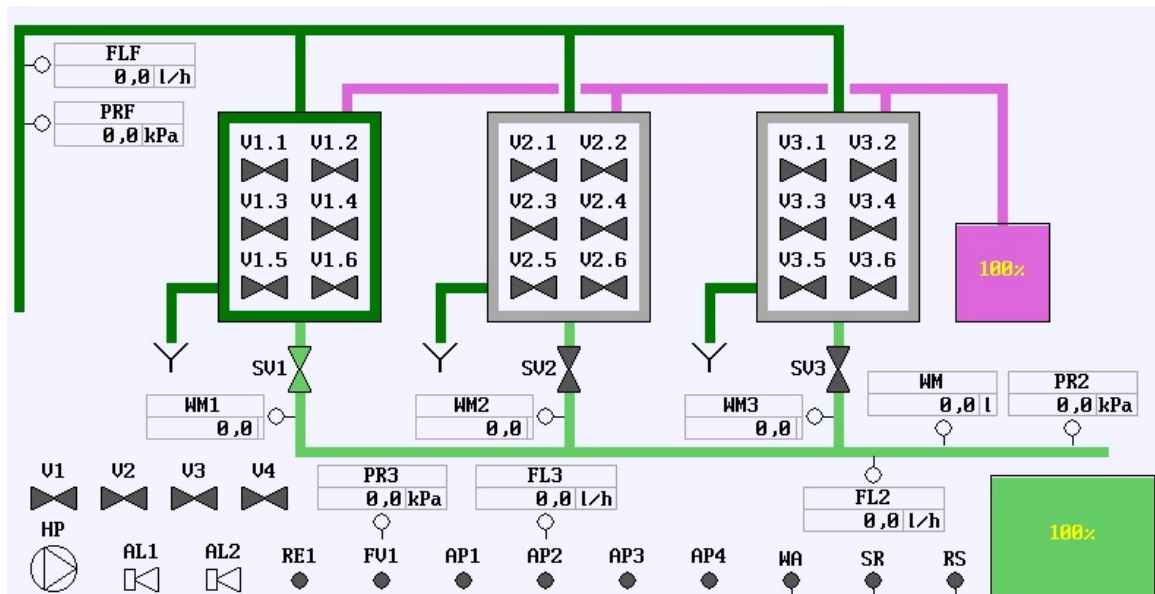
§ 30 "Terminology" on page 99 offers an overview of the meaning of the abbreviations used.
These abbreviations may differ from the picture, because they have been modified by the user.

1.4. Unit configuration

In the controller the unit configuration can be configured via the menu option "Unit" (in the main menu).
First of all, an inventory has to be made of the components that have to be driven by the controller,
and to which pins these components are connected. The inventory is described in § 5 "Unit
Configuration" on page 12

Subsequent to the inventory any delays, limits etc. can be set for the various components under the
"Programming - Components " option. This is described in § 6 "Component" on page 17.
Next the various phases ("Service", "Regeneration" etc.) can be programmed.
The functions that are switched on or switched off can be set for each phase. A time duration may also
be entered. This is described in § 8 "Filter Unit" on page 43.

1.5. Description of the unit

The controller distinguishes different phases:
-    Service   Production of softened / filtered water
-    Service Stop   Installation out of service, service valve closed
-    Regeneration   Regeneration / rinse of a filter
-    Standby   Installation out of service : no production of softened water
-    Alarm   Installation out of service : no production of softened water

The controller is routinely delivered in single filter mode and the "Service" phase.

The production of softened water can start depending on the level switch (es) (HL and LL) or manually. When no tank is present then the production will always be activated.
When one or more water meters are activated so a cumulative water meter will be updated and can be read off under the menu option "Information" (see 11.5 "Counters" on page 54).
Also maintenance-related volume counter will also be maintained, if this is programmed (see § 24.2 "Maintenance" on page 87). This can be read off in the same window.

A regeneration can be initiated in several ways. This will be depending on volume (water meter), interval time, real time clock and on a external switch.

Also a regeneration can be blocked, This is possible through switch functions as low level inside the chemical (brine) tank and wait. Furthermore the regeneration can be prohibited when the start of a regeneration falls within a programmed time zone. The regeneration will be started automatically when the time is outside the time zone again.
Also a minimum regeneration distance can be activated. This timer will be started at the end of a regeneration. When the next regeneration start is within the programmed distance the regeneration start will be prohibited. It is possible to choose between an automatic regeneration start at the end of the distance or to start the regeneration manually.

The controller is suitable for operation of a single, duplex and triplex (when three relay circuit boards are present) plant.
For duplex and triplex pants it is possible to run in alternating (duty-standby) service, parallel service or depending on the flow.
In parallel service you can choose if the filters should regenerate directly one after the other.
Flow depending service means that depending on the demand of softened water there will be filters switched in or out of service.

Depending on the situation there will be manual options shown in the menu "Manual".

2. Picture of front side
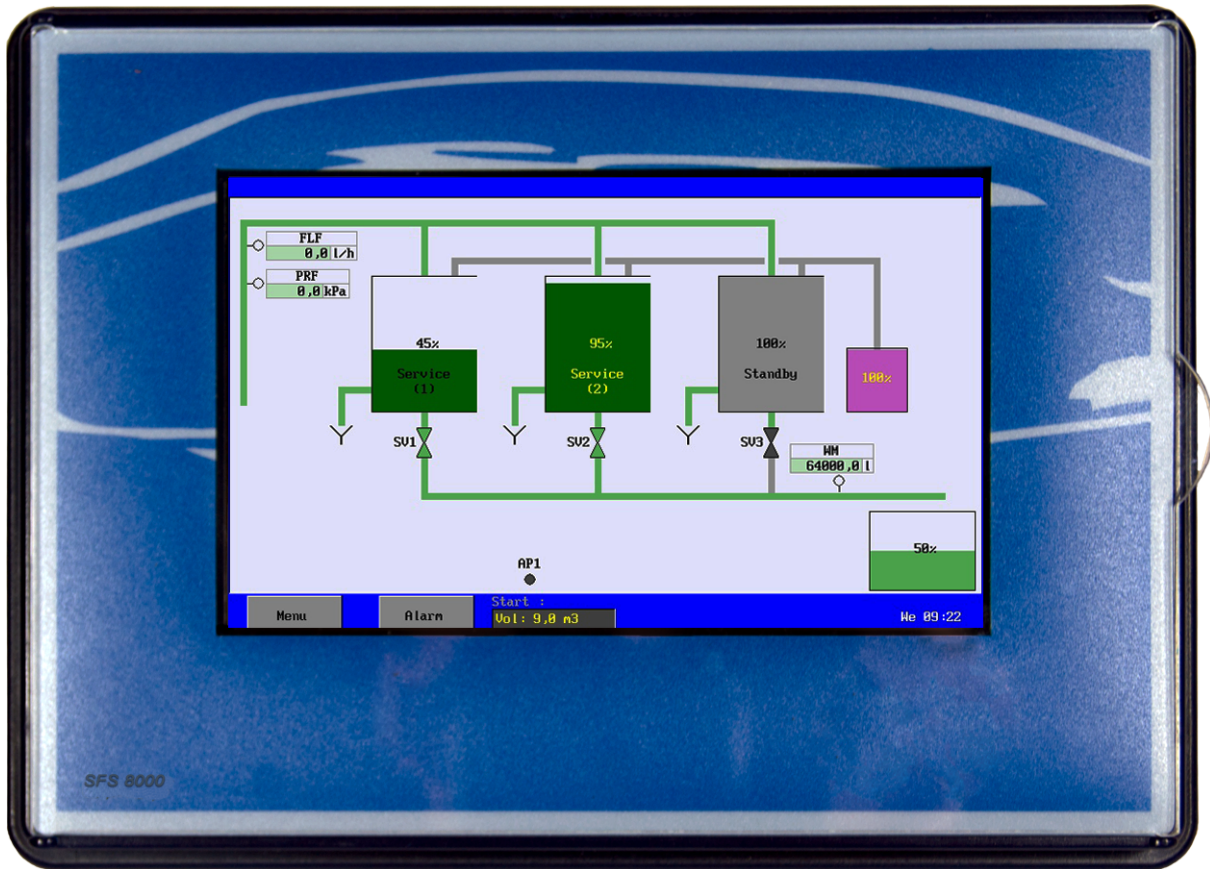
1 LCD display + touch panel

3. Measurement and function display

3.1. LCD display

The LCD display features further information about the active process.
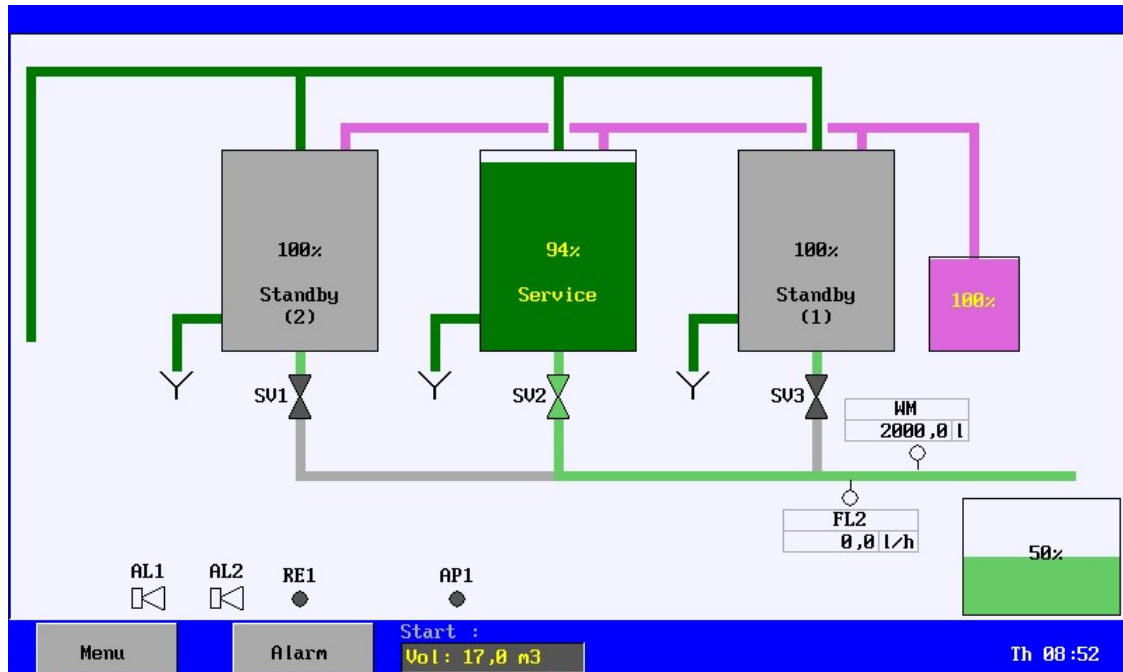
In the display the measurement values or statuses of the connected components will be shown.

Piping
The pipes can have various colours.
These colours have the following meanings:

no medium
unrefined water
permeate
chemicals
air

Measured Values
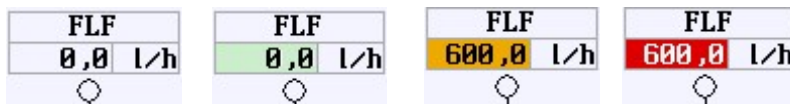
The measured values can be displayed with various background colours.
These colours have the following meanings:

- white   : the measured value is not monitored.
- green   : the measured value is monitored and is in order.
- orange   : the measured value is too high or too low, but the delay time is not over yet.
- red   : the measured value is too high or too low and the delay time is over.

Positions of the inputs:
The (digital) inputs can have the following statuses:

        The input function is not supervised (grey).

        The input function is supervised and inactive (green).

        The input function is supervised and active, but the time delay is not finished yet (yellow).

        The input function is supervised, active and the time delay is finished (red).

Positions of the outputs:
The symbols can be displayed in the following colours.

Pumps:
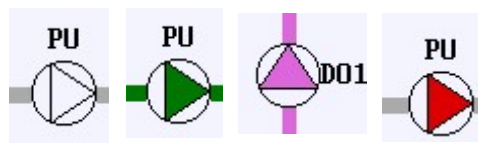
- white   : The pump is turned off.
- dark green   : The pump is turned on and unrefined water is being pumped.
- purple   : The pump is turned on and chemicals are being pumped.
- red   : The pump is turned off. There is a malfunction in the pump.

Shut-off Valves:
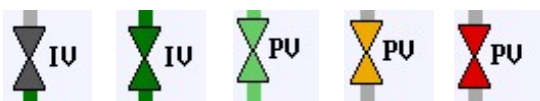
- dark gray   : The valve is closed.
- dark green   : The valve is opened and unrefined water runs through.
- light green   : The valve is opened and softened water runs through.
- orange   : The security of the valve is activated, but the delay time has not yet passed.
- red   : The security of the valve is activated and the delay time is over.

Attention: If the pulse function for the dosing pump output is activated a "|" will also be displayed next to the deactivated relay.
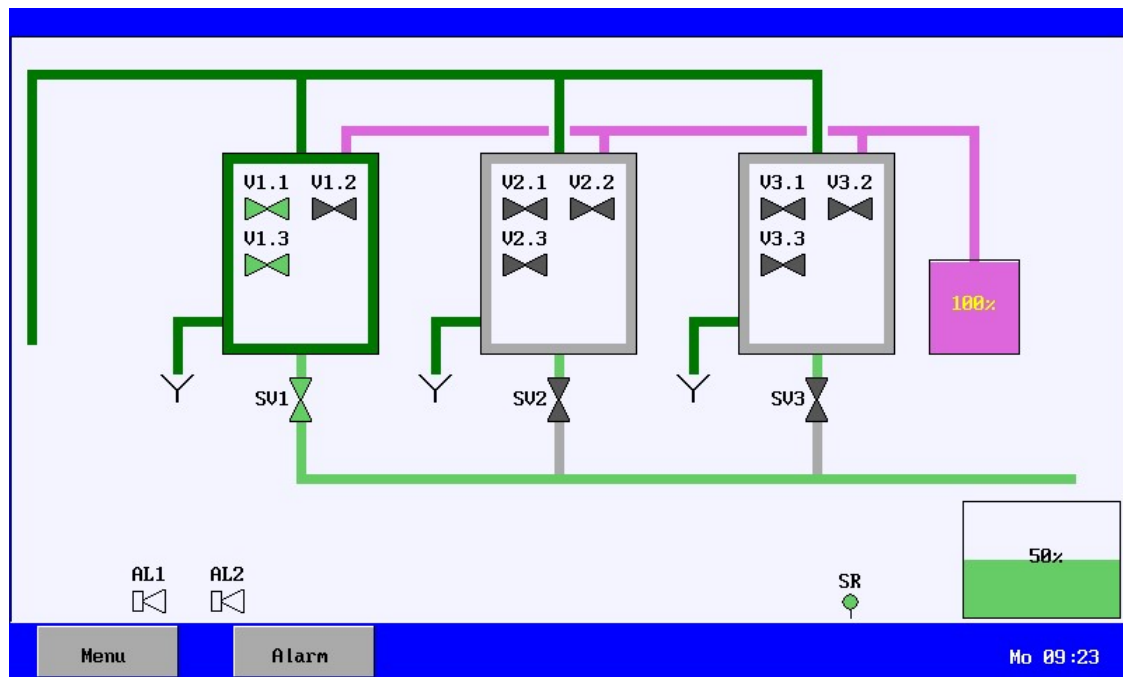
In the "main" window, the single (solenoid) valves, linked to a filter, will not be shown.
They can be made visible by pressing one of the filter.
When pressing one of the filters again, you will go back to the main screen again.

Situation of the softener / filter
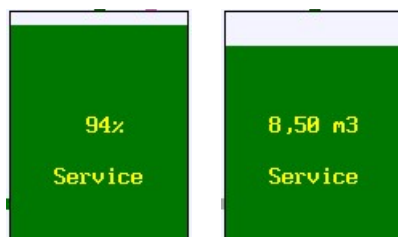
The remaining capacity can be displayed in % or m3. See also § 7.2 Filters on page 39.

Situation of the tank
The tanks can be displayed with different background colours.
These colours have the following meanings:
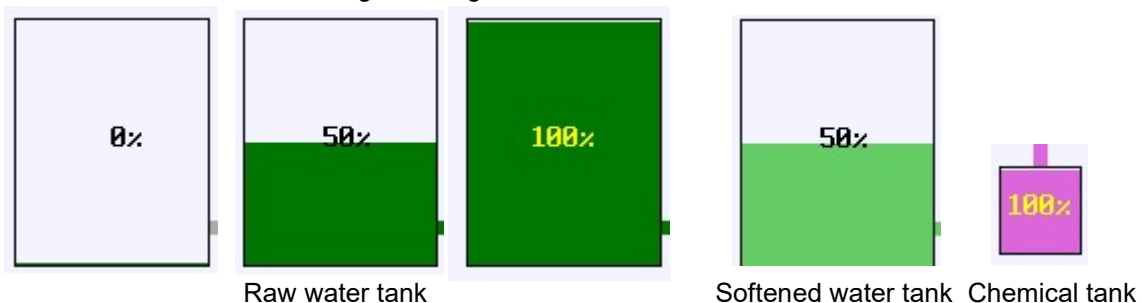
If the tank is equipped with level measuring (0(4)-20mA), the level will be indicated per ratio.

Status bar:

Menu	Alarm	Start : Vol: 10,0 m3		Th 09:10

There are keys on the status indicators that allow you to activate the menu or the alert window. The lower bar is used to display an exceptional situation (such as a manual stop or the remaining volume or interval time until a regeneration) and the current time.

Remaining time until next regeneration :

Menu	Alarm	Start : Int: 7:59h		Fr 10:12

Day and time for next regeneration :

Menu	Alarm	Start : Clk: Fr 22:00		Fr 10:26

Remaining time of the minimum regeneration distance :

Menu	Alarm	Block : MinRg: 4:00h	Fr 10:36

Block zone for regeneration :

Menu	Alarm	Start : Vol: 800,0 l	Blok : 09:17	Ma 09:09

Menu	Alarm	Start : Vol: 900,0 l	Block : We 07:00	Mo 09:18

Menu

In the menu, the windows have been provided with a unique number in the top right-hand corner.

Main menu	1
Manual control
Information
User settings
Installation
Clock
Language
Media
Service
Security
Close

Clock	7001
Time
Date

Hour   11

Minute   44

Notation   24

Close

This can be used to check whether the correct window is selected at all times (in the case of telephone support, for example).

4. General operation

A touch panel is used for the operation and programming of this controller.
Details are provided below about the general arrangement of the screen, the meaning of the various
"keys" and the general display /input windows.

4.1. Main screen
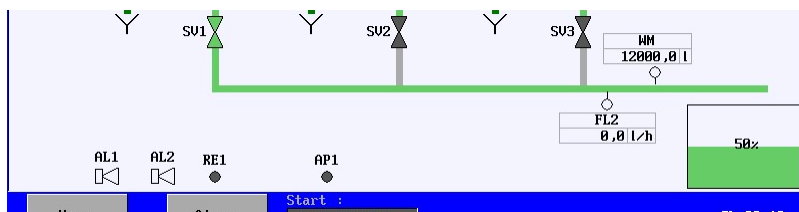
In the main screen the keys have the following functions:

 To the menu.   To the alarm window

4.2. Menu
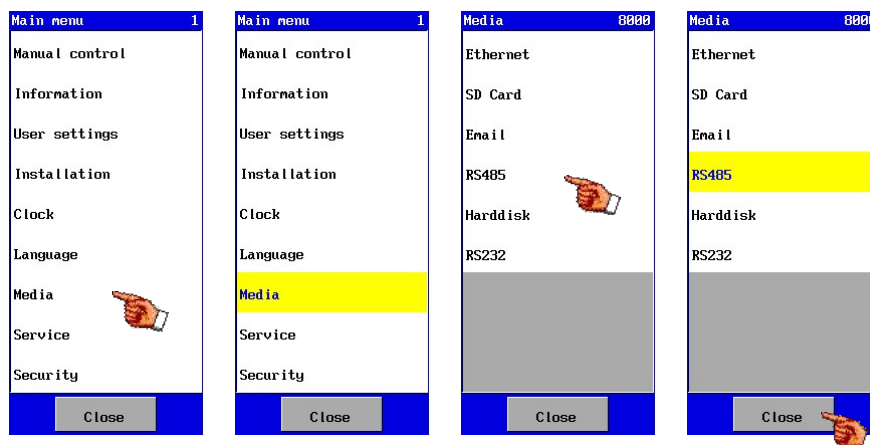
You can select the different items within the menus. The selected item will be displayed in yellow and
the subordinate menus or windows will be displayed.
If the selected menu consists in several submenus, the two last menus will be displayed. The menu
can be closed by pressing the button.
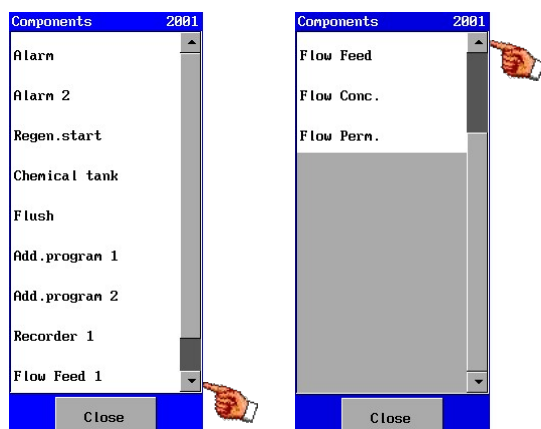
If the number of menus is bigger than the number of available positions, the menu will appear in a
scroll bar. The previous or next (invisible) items are reachable through the up and down arrows.

4.3. Window

The various settings can be made in windows.
The different types of settings are: values, texts and dropdown lists.

4.3.1. Set value or text

The box with the required settings has to be selected to change a value or text and calling up a new window where the value / text can be changed.

This window invariably has three choices with a special meaning:

- ✓ Confirm the (changed) setting. You then quit the window.
- ✗ If you exit a window, the modified values will not be saved.

- BS (Backspace) Erase last character.

The changed setting is stored in the memory after you quit the main menu.

4.3.2. On / off option

The menu features the so-called "on/off" options.

If the "check" mark appears the option is switched on. Other settings can be activated and appear by switching on this option.

4.3.3. Set dropdown list

A dropdown list is identified by a field with an arrow pointing downwards on the right-hand side.

Pressing the dropdown item thus calling up a window with a list of options.

Confirming the choice calls up another window for the final confirmation.

Are You Sure ?
Change to :
yyyy/mm/dd

✓ Confirm the choice again.
✗ Cancel the choice.

The changed setting is stored in the memory after you quit the main menu.

4.3.4. Confirmation

In some cases confirmation is required subsequent to a choice or change. The [✓] key can be used to confirm the choice or change. The [✗] key can be used to cancel the choice or change.

Example:

Are You Sure ?
Installation
to standby ?

4.4. Alarm window

The operation in the alarm window is described in § 9.2 "Alarm window" on page 48.

5. Unit Configuration

This chapter describes how the unit may be configured.

The unit configuration option is featured in the main menu.
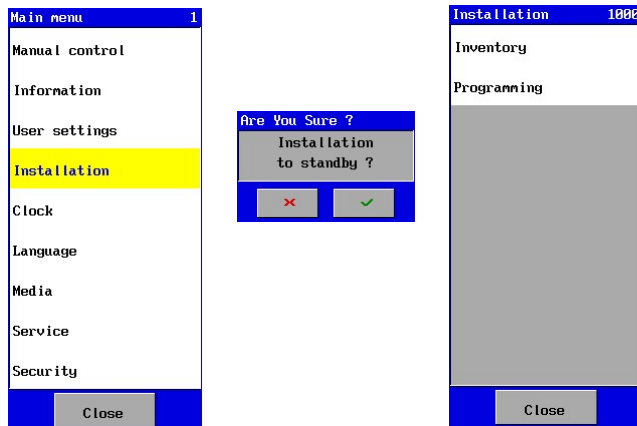
If the unit configuration is selected you will be asked if the unit may be placed in Standby.
The configuration may be accessed only if the unit is in Standby.

If the unit is placed in Standby the following window will appear where a choice is made between the inventory of the connected components and the programming of the components and the phases of the softener / filter unit.

The inventory first of all has to be made after which the inventoried components are programmed and activated during the softener / filter plants various process phases.
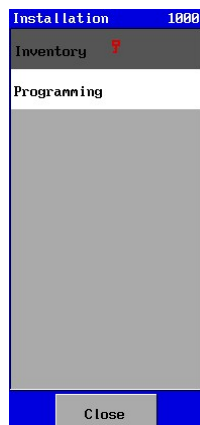
The inventory menu may be secured against unauthorised changes, upon which a key appears after "Inventory" to show the option is secured
(see also § 25.1.2 "Menu" on page 93).

5.1. Inventory

Before the components and process phases can be programmed, an inventory has to be made of the components with the corresponding properties.
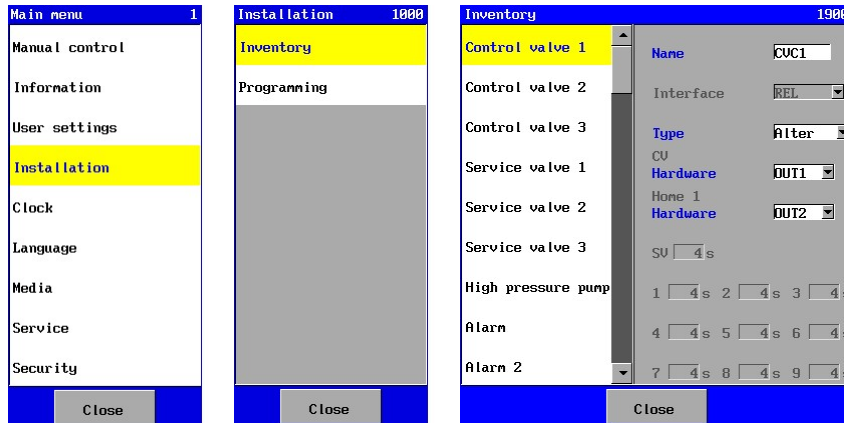
Selecting the item "Inventory" calls up a list of potential components that may be connected. If a specific component from the list is connected to the controller the component's corresponding window can indicate which pins the component is connected to.

The specific properties of a component may also be entered, such as a cell constant or whether a switch is "normally open" or "normally closed".

An own name or code can be set for each component (maximum 6 characters). This name will be displayed in the diagram and in the log data.

When a component is connected to the controller "Hardware" can show which pins the component is connected to.

An overview is provided of the hardware to which the corresponding component can be connected. It also indicates which hardware is already occupied.
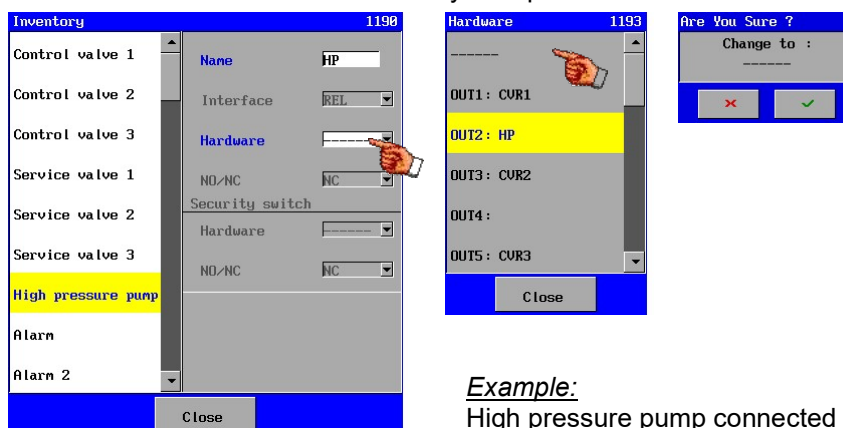
Example:
High pressure pump connected to OUT2.

If a component is not connected, then the "----" option should be chosen. This disconnects hardware and software.
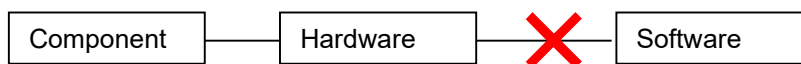
The component will then no longer be listed in the remaining settings, unless the component was connected to another component in the settings for that other component. In that case, the text will be "crossed out".

When a component has to be moved to other terminals, where a component is still connected, an automated process has to be used to release the component that is detached. The component can then be connected to the terminals made available.

If an inventory window for a specific component differs from the windows shown here more information about this can be found in the corresponding component in § 6 "Component" on page 17.

5.1.1. Security switch
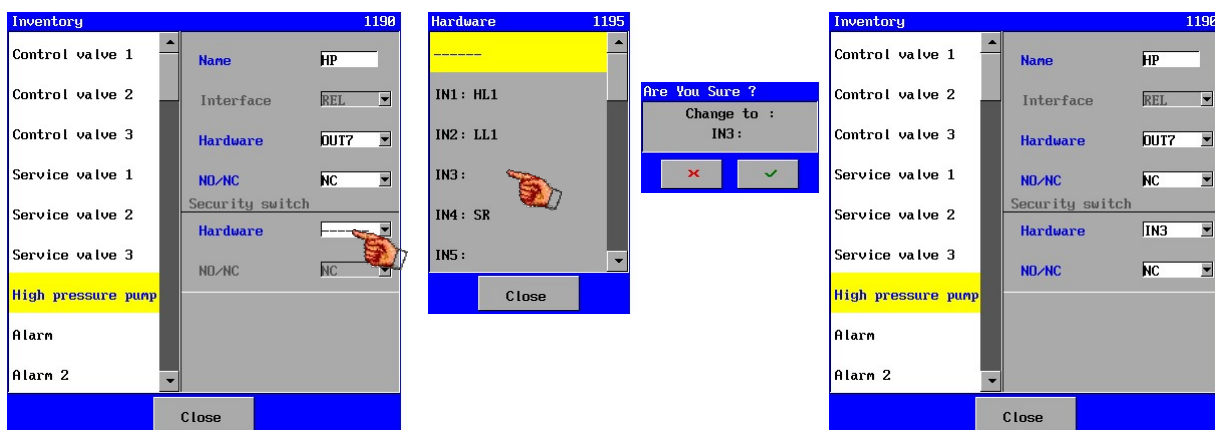
Circuit breakers can be activated in certain components, such as valves and pumps. These can be linked to one of the available inputs and it can be indicated whether the switch is "normally closed" or "normally opened".

The delay on an alarm indication for the valves is fixed at 4 seconds. For the pumps it is 1 second by default.
If a circuit breaker has been defined, it will always be monitored.

If an alarm situation occurs, then the name of the respective valve or pump will be displayed as a notification.

5.2. Programming

Subsequent to the inventory of the components and entering the specific properties of the components, you may enter other properties in the component programming and the various phases of the softener / filter unit can be set.
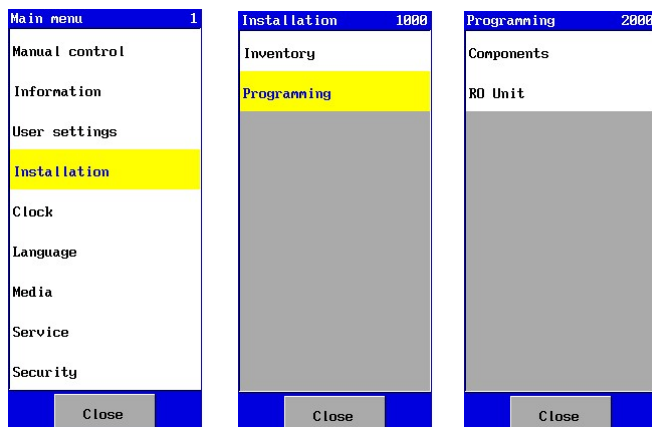
The program menu can be secured against unauthorised changes. A key then appears after "Programming" to show the option is secured (see also § 25.1.2 "Menu" on page 93).
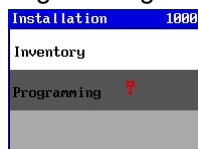
5.2.1. Components

The features of a component can be programmed.
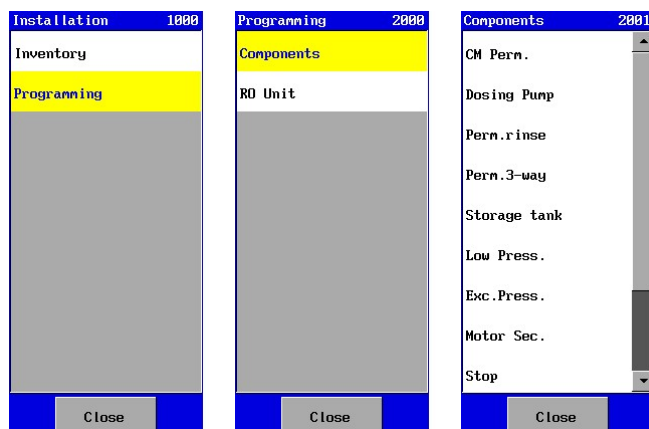
If other settings are required for the component the component is not displayed in the programming list for the components. Nor will a component be displayed in the list if this is not connected (not linked to the hardware)

More information about the programming of a component can be found in § 6 "Component" on page 17.

5.2.2. Units (phases)

Once the components have been inventoried and programmed the various process phases of the softener / filter unit may be programmed.

Installation 1000	Programming 2000	Programming 2002	Filter 1 5000	Service 5110
Inventory	Components	Filter 1	Properties	Phase ☐ High pressure pump
Programming	Installation	Filter 2	Service	☐ Flush
	Filters	Filter 3	Service Stop	☑ Max.Flow Feed 1
			Regeneration	☑ Max.Flow 2
			Standby	☑ Max.Press Feed 1
Close	Close	Close	Close	Close

Only the programmable phases will be displayed.

During a "time" phase the time is entered (0-999) in seconds or minutes. If a time of 0
is entered the corresponding phase is omitted.
It may also be shown in each phase which components are activated.
If a component is not displayed this means it is not connected or the component cannot be set for this phase.

If an analogue output has been activated for the relevant component, then a percentage of the range of the analogue output can be set.
If a percentage of 0% is entered, then the relevant relay output can be switched off; at a different value, the relay output is activated.

More information about the programming of the process phases is featured in
§ 8 "Filter Unit" on page 43.

6. Components

An examination is made in this chapter of the inventory and programming options for the various components that have to be connected.
This component may divided into:

- Valves   - Storage tank
- Pumps   - Flow meter
- Alarm   - Pressure meter
- Switches   - Other
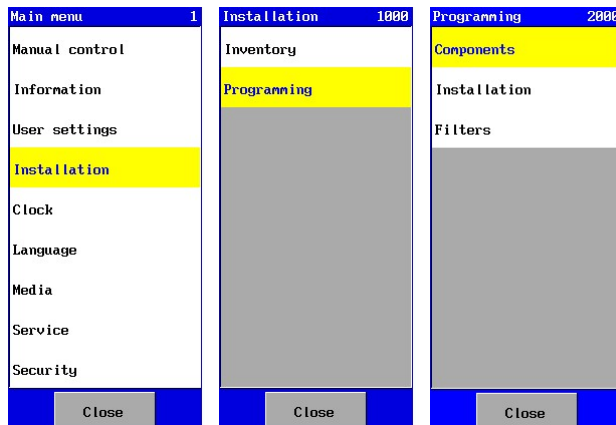
Where a reference is made in this chapter to inventory, this means the window located via the "Installation – Inventory" options. See § 5.1 "Inventory" on page 13 for more information.

Where a reference is made in this chapter to the programming of a component this means the window located via the "Installation – Programming – Components" options.

6.1. Valves

The valves may be connected only to the relay output functions (OUTx). Furthermore, a safety switch can be activated for the respective valve (see § 5.1 "Inventory" on page 12).
Whether a valve is open or closed can also be determined for each process stage.

6.1.1. Service valves
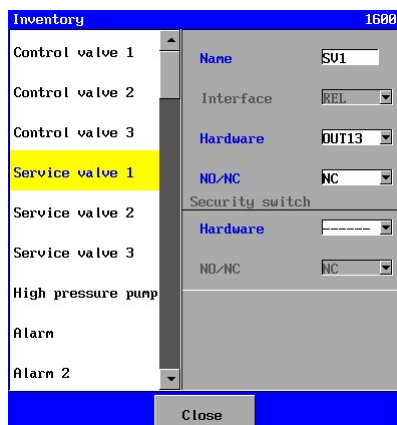
In the case of the "Service valve" all that has to be entered, in the inventory, is the relay output it is connected to.

A security switch can be activated. This can be linked to one if the available inputs, and it can be set if the switch is "normally closed" or "normally opened".

For more information, see § 5.1 "Inventory" on page 13.

A service valve is linked to a filter. This is a fixed link (Service valve 1 linked to filter 1, ...)
The service valve will be opened during the service phase.
There is a possibility to let the service valve stay open in case there is no filter available any more.
This could be the case during the situations capacity exceeded and when a filter is waiting for a regeneration. This is programmable in the corresponding phase.

6.1.2. Solenoid valves
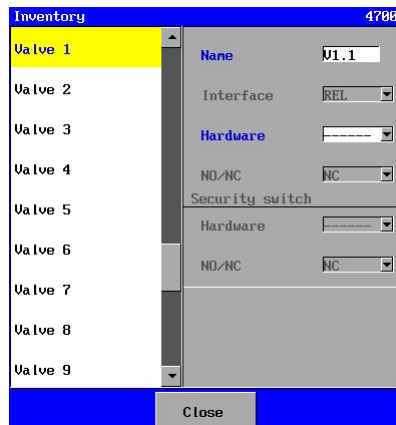
In the case of the "Solenoid valve" all that has to be entered, in the inventory, is the relay output it is connected to.

A security switch can be activated. This can be linked to one if the available inputs, and it can be set if the switch is "normally closed" or "normally opened".

For more information, see § 5.1 "Inventory" on page 13.

In total there are 22 solenoid valves available. For each filter, 6 valves will be available, only for that filter. Each valve will be programmable as activated or deactivated for each phase of that filter. Furthermore there are 4 valves available for all filters

Filter 1 : Valves 1 – 6
Filter 2 : Valves 7 – 12
Filter 3 : Valves 13 – 18

Valves 19 – 22 free to use for all filters.
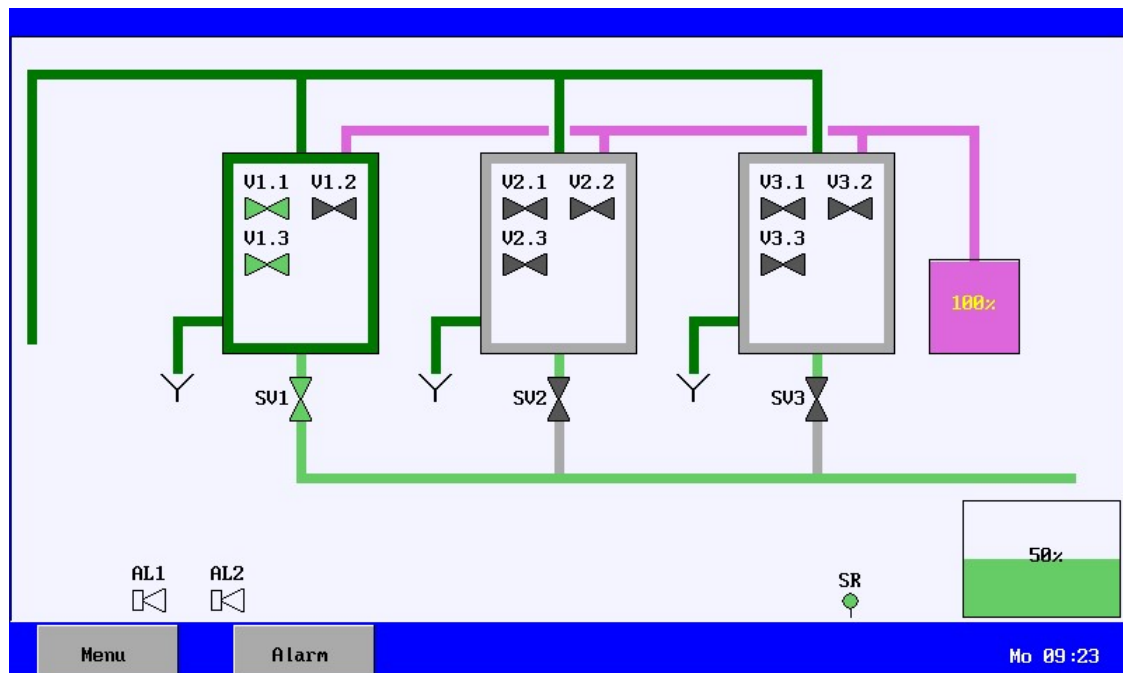
In the "main" window, the single (solenoid) valves, linked to a filter, will not be shown.
They can be made visible by pressing one of the filter.
When pressing one of the filters again, you will go back to the main screen again.

6.2. Multiport valves

In the case of the "Multi port valve" there has to be entered, in the inventory, the relay output the central valve is connected to and when available where the home switch is connected to.
For more information, see § 5.1 "Inventory" on page 13.

You can select the type of multiport valve (Alternating, Pulse control ,…).
A multi port valve is linked to a filter. This is a fixed link (Multi port valve 1 linked to filter 1, ...)
The control of the Multi port valve is depending on the phase of the filter.
There are no further settings available for this valve.

6.2.1. Alternating control

For alternating control, the relay output where the multi port valve is connected to needs to be entered.

When there is a home switch available the relay output where this switch is connected to can to be entered

6.2.2. Pulse control

For alternating control, the relay output where the multi port valve is connected to needs to be entered.

When there is a home switch available the relay output where this switch is connected to can to be entered

Also there has to be entered the pulse length for each phase. For "SV" you have to enter the pulse length to go from the last regeneration phase to the service position.

6.2.3. External control

```
Inventory                    1900
Control valve 1        ▲
Control valve 2           Name          CVC1
Control valve 3           Interface     REL    ▼
Service valve 1           Type          Extern ▼
                          CV
Service valve 2           Hardware      OUT1   ▼
                          Home 1
Service valve 3           Hardware      OUT2   ▼
High pressure pump
Alarm                     1   48 s
Alarm 2               ▼
                   Close
```

For alternating control, the relay output where the multi port valve is connected to needs to be entered.

When there is a home switch available the relay output where this switch is connected to can to be entered

Also there has to be entered one pulse length to start the regeneration. The regeneration steps will be controlled by the multi port valve.

6.2.4. Euro valve

```
Inventory                    1900
Control valve 1        ▲
Control valve 2           Name          CVC1
Control valve 3           Interface     REL    ▼
Service valve 1           Type          EURO   ▼
                          CV
Service valve 2           Hardware      OUT1   ▼
                          Home 1
Service valve 3           Hardware      OUT2   ▼
High pressure pump
Alarm
Alarm 2               ▼
                   Close
```

For controlling an Euro valve both relay outputs needs to be defined.

Relay control :

	CV	Naloop
Service	Off	Off
Regeneration phase 1	On	Off
Regeneration phase 2	On	On
Regeneration phase 3	Off	On

6.3. Pumps

The pumps may be connected only to the relay outputs (OUTx). Furthermore, a circuit breaker can be activated for the particular pump per process step, if a pump is switched on or off.

6.3.1. High pressure pump

Inventory	1190
Control valve 1	Name HP
Control valve 2	Interface REL
Control valve 3	Hardware OUT7
Service valve 1	NO/NC NC
Service valve 2	Security switch
Service valve 3	Hardware ------
High pressure pump	NO/NC NC
Alarm	
Alarm 2	
	Close

In the case of the "High pressure pump" all that has to be entered, in the inventory, is the relay output it is connected to.

A security switch can be activated. This can be linked to one if the available inputs, and it can be set if the switch is "normally closed" or "normally opened".

6.4. Alarm

An alarm output may be connected only to a relay output function (OUTx).
Activation of the relay is completely independent of the phase the unit is in.

In the case of the "Alarm output" all that has to be entered, in the inventory, is the relay output it is connected to.

The situation in which the output is activated can be set in the alarm output-related programming.

If a component is not connected or a monitoring is not activated (such as minimum conductivity monitoring) the monitoring will not appear in this alarm overview list either.

If the monitoring is activated, a check mark ✔ will be shown in front of the corresponding monitoring in the list.

If a monitoring is activated ("Alarm on"), you may choose to switch the alarm output off again automatically ("Automatic reset"), if the alarm situation is removed.
In some cases there is no point in automatically switching off the alarm output nor is there any need to do so. Examples of this are a power failure or maintenance, when the option for an automatic cut-out is not displayed.

The alarm output may also be switched off manually. See § 9 "Alarms" on page 48 or via an external switch where appropriate. See § 6.5.3 "Alarm reset" on page 24.

Attention!
Alarm messages "ROM settings" and "Default settings".
An alarm is always given when there is a fault in the configuration file. This cannot be set.
In that case the controller has to be reset or a back-up has to be loaded via the boot software.
See § 20 "Hard disk" on page 75 and § 28 "Boot software" on page 96.

6.5. Switches

Switches (e.g. level switches) may be connected only to the digital inputs (IN1 to IN8).
Whether the input is monitored or not monitored can also be determined for each process stage.

In the case of the switches, the input this is connected to also has to be entered in the inventory.

Whether the switch "is "normally closed (NC)" or "normally open (NO)" also has to be entered.

Example for a "Wait" switch.

All switches have other settings on top of the inventory settings, such as a delay on the monitoring. An examination is made in following sections of what the function of the switches is, how the controller will react and what settings are available.

If a monitoring on a switch is switched on during a process the process will be controlled during this time and if the switch is still active after a delay (that can be set) the unit is switched off. The exception to this is the "Alarm reset" switch. This does not affect the process but only the alarms.

Attention!
The switches in the storage tank (high and low level) are not covered here. These correspond to the "Storage tank" component.

6.5.1. Wait

The function "Wait" can be used for several purposes (e.g. pressure monitoring).

The input will be monitored at the start of a regeneration and during the regeneration.
When the input is activated at the start of a regeneration, the regeneration will not be started until the input is deactivated again.
When the input is activated during a regeneration so the regeneration time will not decrease any further until the input is deactivated again. The outputs with function "Additional program" will all be deactivated when this input is activated.

For information about the inventory see § 6.5 "Switches" on page 23.

A further delay may be entered (0-9999 seconds) for the monitoring.

6.5.2. Regeneration start

With the switch function "Regeneration Start" you can start a regeneration, remotely.

For information about the inventory see § 6.5 "Switches" on page 23.

A further delay may be entered (0-9999 seconds) for the monitoring.

The ignore time setting (0-999 seconds) determines the number of seconds the "Start" input is blocked after a new regeneration or a filter changeover, for instance to wait for a new analysis by a water hardness meter.

6.5.3. Alarm reset

The "Alarm reset" switch can be used for an alarm output to be switched off remotely.

The switch does not affect the unit's process run.

For information about the inventory see § 6.5 "Switches" on page 23.

A further delay can be entered (0-9999 seconds) for monitoring.

6.6. Tanks

6.6.1. Storage tank

There are two available types of level measuring, namely measurements with level switches (1 or 2) or level measurements with a 0(4)-20mA output that can be connected to a 0-20mA control input (if available).

Level switches

If the level switches are being used, the "Interface Input" will have to be specified.

Two level switches may be placed in a storage tank. A high-level switch (HL) and a low-level switch (LL). For the inventory the level switch that is connected can be indicated.

If both level switches are not connected the unit will always be in automatic service.

If both switches are connected the unit will be switched in the "Service" phase as soon as the low-level switch is active. The unit will quit the "Service" phase again as soon the high-level switch is active.
If both switches are active (owing to a faulty connection, cable cut or defect in one of the switches) the high-level switch has the highest priority and the unit will switch off.

If only a high-level switch is programmed, the storage tank programming can be used to set a delay before the unit is switched on in the "Service" phase. If the high-level switch is active the unit will move directly out of the "Service" phase. In all other cases no delay has to be set while the storage tank does not appear in the list of components with programmable settings.

Level measurements 0(4)-20mA output

If level measuring with power output is active, the "0-20mA Interface" will be selected.

It will subsequently be possible to select a 0-20mA input. And after that, it will be possible to select the range of the measurement cell (0-20mA or 4-20mA).

If no hardware connection is made, it will only be possible to switch the installation on and off manually.

As far as level measuring is concerned, the percentage with empty tank and the percentage with full tank can be specified.

The installation will enter the "Service" phase as soon as the percentage goes below the level of the one specified for an empty tank. It will leave the "Service" phase as soon as the percentage level reaches higher than the level specified for a full tank.

6.6.2. Chemical tank

It is possible to have one level switch in a chemical tank (low level).
Please indicate at which exit the level switch should be connected during the inventory.

You can secure the low-level switch by entering a delay of 0-9999 seconds. Also, it is possible to indicate whether the unit must be switched off when the level in the chemical tank is too low. When the unit is turned off, you can have the unit turn on automatically when the chemical tank is filled up to a sufficient level.

When the chemical tank is empty at the start of a regeneration, the regeneration will be inhibited until the tank is full again. It is possible to force a regeneration start by hand.

6.7. Recorder outputs

Through optional prints (ca-3rec), three or six recorder outputs (0-20mA) can be added. If the print is connected, then the recorder functions will be displayed in the inventory list.(Recorder 1,2,3,4,5 and 6)

Each output can be set separately within a range of 0-20mA or 4-20mA. Which signals are to be transmitted at the output concerned can be specified next.

All the measured values (flow and pressure) can be transmitted to the 0-20mA output.

"Activate" must be checked in order to transmit a signal. Next, a range can be specified by entering a minimum and a maximum value. If the measured value of the measurement concerned is lower than (or equal to) the set minimum value, then a current of 0 mA (if the output is set at a current range of 0-20mA) or of 4 mA (if the output is set at a current range of 4-20mA) will be transmitted. If the measured value is higher than (or equal to) the set maximum value, than the output current is 20 mA. If the measured value is within the set measuring range, then the output current will be calculated. The characteristic has a linear coherence.

If a signal is transmitted, then the signal concerned will be checked in the list of the recorder output concerned.

6.8. Flow meter

The flow meters equipped with a 0(4)-20mA output or paddle wheel potentialfree output can be connected to the control panel.
It is possible to specify thresholds for the upper and lower limits, both with a programmable time delay.
It is also possible to specify whether the installation should be shut down in case of either positive or negative crossing of the specified values.
If the thresholds are activated, it is possible to send an alarm message when, for instance, the upper threshold is exceeded (this can be either through a relay or with an e-mail (only possible with SFS8x1x-xxxx)).

The properties of the flow meters are only visible if the control panel is equipped with prints with 0-20mA inputs (ca-fl-pr-3an) or pulse inputs (ca-pulse).

6.8.1. Flow Feed

This meter indicates the flow for the incoming water.
The way of editing flow measurements is described in § 6.8.4 "Flow meter settings" on page 29.

When monitoring for this measurement has been activated, the limit(s) will be checked during the steps "Service", "Regeneration" and "Pre regen. 1". For the steps "Wait" and "Capacity Exceeded" these checks are programmable, for each filter, at the corresponding step.

6.8.2. Flow 2

This flow measurement is for outgoing water.
The way of editing flow measurements is described in § 6.8.4 "Flow meter settings" on page 29.
With the inventory, the screen number needs to be increased by 20 each time.
With programming the screen number needs to be increase by 80 each time.

When monitoring for this measurement has been activated, the limit(s) will be checked during the steps "Service" and "Pre regen. 1". For the steps "Wait" and "Capacity Exceeded" these checks are programmable, for each filter, at the corresponding step.

6.8.3. Flow 3

This flow measurement is for general use.
The way of editing flow measurements is described in § 6.8.4 "Flow meter settings" on page 29.
With the inventory, the screen number needs to be increased by 25 each time.
With programming the screen number needs to be increase by 100 each time.

When monitoring for this measurement has been activated, this will be ignored during the steps "Stand-by" and "Service Stop". For the remaining steps these checks are programmable, for each filter, at the corresponding step.

6.8.4. Flow meter settings

This description cites the properties of flow measurement in the feed water as an example.
Similar properties apply for other flow measurements.

The 0-20mA input that is connected to the concerned flow meter can be selected for the inventarisation.

The current range of the flow meter also has to be specified (0-20mA or 4-20mA).

6.8.5. Properties flow meter

In this window you can set in which unity the measurement value should be displayed.
Furthermore, the measuring range of the measuring cell can be specified. Measured flow with minimal current ("Range Min." between 0,0 and 10.000,0) and measured flow with maximal current ("Range Max." between 0,0 and 10.000,0). We consider that there is a linear characteristic between the current and the measured flow for these measurements.

6.8.6. Monitoring minimum flow

For monitoring purposes the minimum limit of 0,1 to 10.000,0 can be entered.

A delay can also entered (1-9999 sec). During the delay the measured value has to be under the limit so an alarm is given if the unit is switched off.

You can set if the unit actually is switched off ("Switch off").

If the monitoring is not switched on ("Monitor") the monitoring will not appear in the programming list of phases.

6.8.7. Monitoring maximum flow

For monitoring purposes the maximum limit of 0,1 to 10.000,0 can be entered.

A delay may also be entered (1-9999 sec). During the delay the measured value has to be under the limit so an alarm is given if the unit is switched off.

You can set if the unit is actually switched off ("Switch off").

If the monitoring is not switched on ("Monitor") the monitoring will not appear in the programming list of phases.

6.9. Pressure meter

The pressure meters equipped with a 0(4)-20mA output can be connected to the control panel.
It is possible to specify thresholds for the upper and lower limits, both with a programmable time delay.
It is also possible to specify whether the installation should be shut down in case of either positive or negative crossing of the specified values.
If the thresholds are activated, it is possible to send an alarm message when, for instance, the upper threshold is exceeded (this can be either through a relay or with an e-mail (only possible with SFS8x1x-xxxx)).

The properties of the pressure meters are only visible if the control panel is equipped with prints with 0-20mA inputs (ca-fl-pr-3an).

6.9.1. Pressure Feed

This meter indicates the pressure in the feed pipe.
The way of editing flow measurements is described in § 6.9.4 "Pressure meter settings" on page 32.

When monitoring for this measurement has been activated, the limit(s) will be checked during the steps "Service", "Regeneration" and "Pre regen. 1". For the steps "Wait" and "Capacity Exceeded" these checks are programmable, for each filter, at the corresponding step.

6.9.2. Pressure 2

This pressure measurement is for outgoing water.
The way of editing flow measurements is described in § 6.9.4 "Pressure meter settings" on page 32.
With the inventory, the screen number needs to be increased by 15 each time.
With programming the screen number needs to be increase by 60 each time.

When monitoring for this measurement has been activated, the limit(s) will be checked during the steps "Service" and "Pre regen. 1". For the steps "Wait" and "Capacity Exceeded" these checks are programmable, for each filter, at the corresponding step.

6.9.3. Pressure 3

This pressure measurement is for general use.
The way of editing flow measurements is described in § 6.9.4 "Pressure meter settings" on page 32.
With the inventory, the screen number needs to be increased by 20 each time.
With programming the screen number needs to be increase by 80 each time.

When monitoring for this measurement has been activated, this will be ignored during the steps "Stand-by" and "Service Stop". For the remaining steps these checks are programmable, for each filter, at the corresponding step.

6.9.4. Pressure meter settings

This description cites the properties of pressure measurement in the feed water as an example. Similar properties apply for other pressure measurements.

The 0-20mA input that is connected to the concerned pressure meter can be selected for the inventarisation.

The current range of the pressure meter also has to be specified (0-20mA or 4-20mA).

6.9.5. Properties pressure meter

In this window you can set in which unity the measurement value should be displayed. Furthermore, the measuring range of the measuring cell can be specified. Measured pressure with minimal current ("Range Min." between 0,0 and 10.000,0) and measured pressure with maximal current ("Range Max." between 0,0 and 10.000,0). We consider that there is a linear characteristic between the current and the measured pressure for these measurements.

6.9.6. Monitoring minimum pressure

For monitoring purposes the minimum limit of 0.1 to 10.000,0 can be entered.

Pressure Feed	3210		Pressure Feed	3210
Properties	☐ Monitor		Properties	☑ Monitor
Monitor Min.	Limit 1,0 kPa		Monitor Min.	Limit 1,0 kPa
Monitor Max.	Delay 10 s		Monitor Max.	Delay 10 s
	☐ Switch off			☐ Switch off
	Close			Close

A delay can also entered (1-9999 sec). During the delay the measured value has to be under the limit so an alarm is given if the unit is switched off.

You can set if the unit actually is switched off ("Switch off").

If the monitoring is not switched on ("Monitor") the monitoring will not appear in the programming list of phases.

6.9.7. Monitoring minimum pressure

For monitoring purposes the maximum limit of 0.1 to 10.000,0 can be entered.

Pressure Feed	3215		Pressure Feed	3215
Properties	☐ Monitor		Properties	☑ Monitor
Monitor Min.	Limit 10,0 kPa		Monitor Min.	Limit 10,0 kPa
Monitor Max.	Delay 1 s		Monitor Max.	Delay 1 s
	☑ Switch off			☑ Switch off
	Close			Close

A delay may also be entered (1-9999 sec). During the delay the measured value has to be under the limit so an alarm is given if the unit is switched off.

You can set if the unit is actually switched off ("Switch off").

If the monitoring is not switched on ("Monitor") the monitoring will not appear in the programming list of phases.

6.10. Water meters

Water meters may be connected only to the digital inputs (IN1 to IN8).
The input will be monitored all the time.

At the settings for the installation (§ 7.4 "Water meter start" on page 40), there can be progammed if a regeneration should be started depending on a water meter and if so, depending on the general water meter or on the water meter that is linked to the corresponding filter.

6.10.1. Water meter

This is the general water meter counting the volume of softened water produced by all filters together.

Inventory	1220
Storage tank	Name: WM
Water meter	Interface: Input
Water meter 1	Hardware: IN1
Water meter 2	
Water meter 3	100,0 l/p
Alarm Reset	
Regen.start	
Wait	
Chemical tank	
	Close

In the case of the switches, the input this is connected to also has to be entered in the inventory.

Furthermore you should enter the water volume per pulse.

No further parameters are to be set for the water meter function.
In the program steps for the processes, it is possible to set the volume intervals.

6.10.2. Water meter 1

This water meter is linked to filter 1.
See also § 6.10.1 "Water meter" on this page.
With the inventory, the screen number needs to be increased by 10 each time.

6.10.3. Water meter 2

This water meter is linked to filter 2.
See also § 6.10.1 "Water meter" on this page.
With the inventory, the screen number needs to be increased by 20 each time.

6.10.4. Water meter 3

This water meter is linked to filter 3.
See also § 6.10.1 "Water meter" on this page.
With the inventory, the screen number needs to be increased by 30 each time.

6.11. Additional

6.11.1. Additional program

In the case of the "Additional program" the inventory has to specify the relay output this is connected to.

During the subsequent programming of the additional program a time duration can be set between between 0 and 9999 (seconds or minutes). If a time of 0 is entered the additional program will be switched on until the end of the phase.

The additional program can switched on with a delay, after the start of the phase. A delay of 0 to 9999 seconds can be entered.

Attention!
If the additional program is activated in successive phases (such as phase 1 to phase), the switch-on delay and dosing time will not be reset during the start of the next phase.
See § 8 "Filter Unit" on page 43 for activating the additional program during the phases.

6.11.2. Additional program 2

See also § 6.116.11.1 "Additional program" on page 35.
With the inventory, the screen number needs to be increased by 5 each time.
With programming the screen number needs to be increase by 5 each time.

6.11.3. Additional program 3

See also § 6.116.11.1 "Additional program" on page 35.
With the inventory, the screen number needs to be increased by 10 each time.
With programming the screen number needs to be increase by 10 each time.

6.11.4. Regeneration

In the case of the "Regeneration" the inventory has to specify the relay output this is connected to.

There are no further settings for this function.

The output will be activated automatically when a filter is In regeneration.

6.11.5. Flush

In the case of the "Flush" output all that has to be entered, in the inventory, is the relay output it is connected to.

For more information, see § 5.1 "Inventory" on page 13.

The flush output can be activated or deactivated for each phase. When no water meter is linked to this function and the function is activated for a phase then during this phase the output will be activated continuously.

When the function is linked to a water meter, there can be programmed a limit value for volume after which a pulse with a programmable length ("pulse on") will be generated. Between the pulses there will be a minimum time as programmed ("pulse off").

7. Installation

This chapter will examine the various phases of the installation.
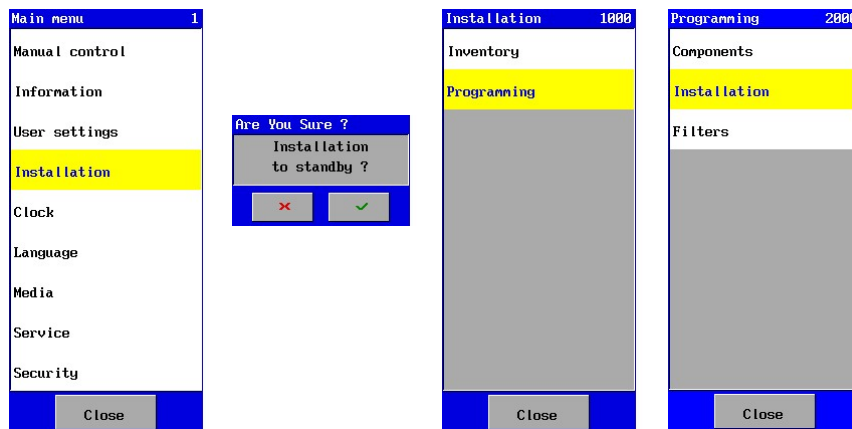
The manual control opportunities are explained in § 10 "Manual operation of the unit" on page 51.

7.1. Properties
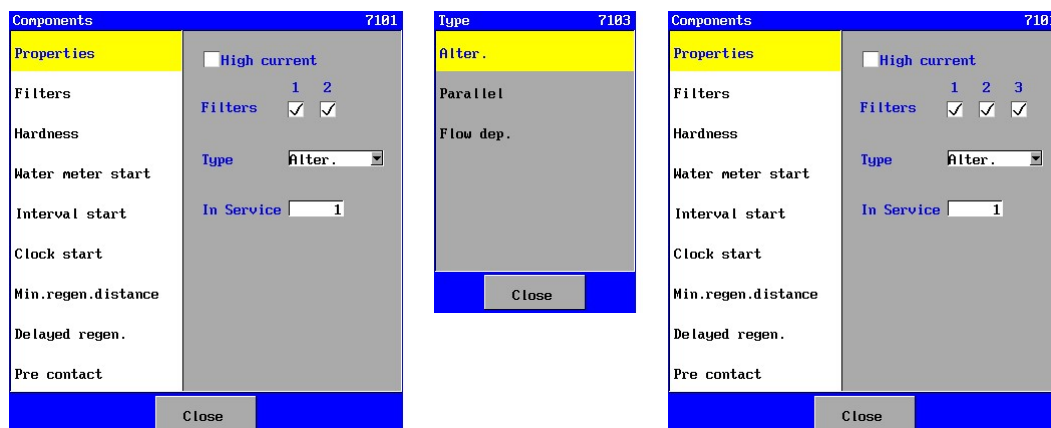
Here you can enter the general settings for the installation concerning single filter, duplex and triplex (when 3 relais circuit boards are available) filter settings.

7.1.1. High current
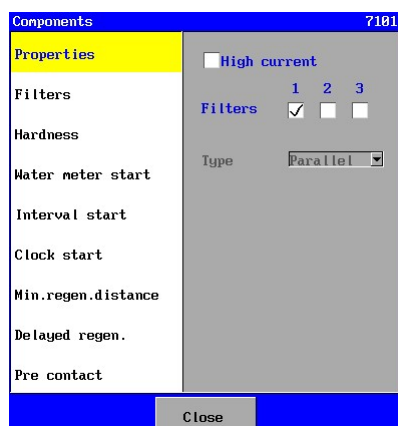
When valve systems operate at 24 V, current loading may be very high especially if the regeneration valve and several service valves are actuated simultaneously.

It is possible to switch on the motor(s) and valve(s) with a time delay of 30 seconds, one after the other. Opening service valves have the highest priority, then closing service valve and lowest priority will have the multi port valve motors.

7.1.2. Single filter

If only one filter has been activated then single filter service will be switched on automatically.

No further settings are necessary.

7.1.3. Alternating service

If multiple filters have been activated you can select for example alternating service.

There will be a minimum of one filter in service and one in standby.
For triplex installations you can enter if there should be one or two filters in service.

7.1.4. Parallel service

If multiple filters have been activated you can select for example parallel service.

All activated filters will be in service.

By "Regen. all filters" you can select if all filters will be regenerated directly one after the other.

7.1.5. Flow depending service

If multiple filters have been activated you can select for example flow depending service.

Er zal worden gestart met één filter in bedrijf. Indien er meer onthard water gevraagd wordt dan kan een filter worden bij geschakeld. Neemt de vraag af dan kan een filter weer worden
uitgeschakeld.

You can program the limit for switching on filter 2.
Filter 3 will go into service when the measured flow rate is above this limit * 2.
A filter will be switch off after the measured flow rate is below the limit value minus the hysteresis.
For filter 3 this value is : limit * 2 – hysteresis * 2
You can program a delay for switching on and off the filters after a measured value above or below the calculated limits

Attention !
This option will only function in combination with flow meter 2. This should be connected and activated.

7.2. Filters

The controller assumes that all filter will be able to deliver the same amount of softened water.
The exchange capacity as entered here, will be valid for all filters.
The remaining capacity of the filter(s) can be displayed in % or m3.

With the option "Data copy" you can determine if the regeneration program is the same for each filter.
If this option is activated, you can define all steps and times for the regeneration. These steps and times will be adopted by all filters.
Also you can enter the number of regeneration steps.

If the option is not activated, you will have to enter the regeneration program for the concerning filter.
See also § 8.4 "Regeneration" on page 45.

7.3. Hardness

The hardness of the incoming water can be entered here.

The volume of softened water that can be delivered by a filter can be calculated according to the formula :

$$\frac{\text{Exchange capacity (°D m}^3)}{\text{Water hardness (°D)}} = \text{Softened water (m}^3)$$

When there is no hardness parameter needed the volume of softened water that can be supplied is the same as the exchange capacity entered.

7.4. Water meter start
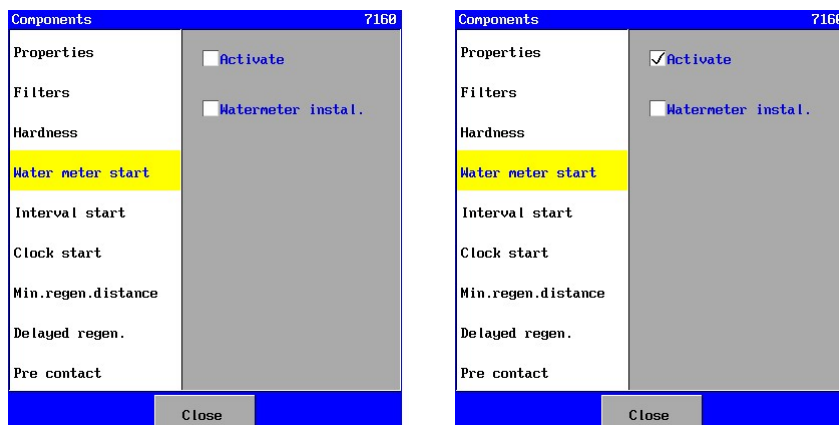
Here you can activate the water meter(s) for initiating a regeneration.
In case of activation, there must de defined which water meter will initiate a regeneration.
Will this be the general water meter ("Watermeter instal." -> hooked) or the water meters that are linked to a filter.
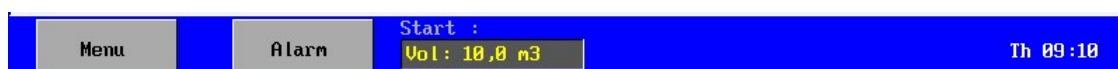
When a regeneration starts (depending on the volume) is activated, you will find in the lower bar of the main screen the information about the remaining capacity, that can be delivered by the filters, until the next regeneration.

7.5. Interval start
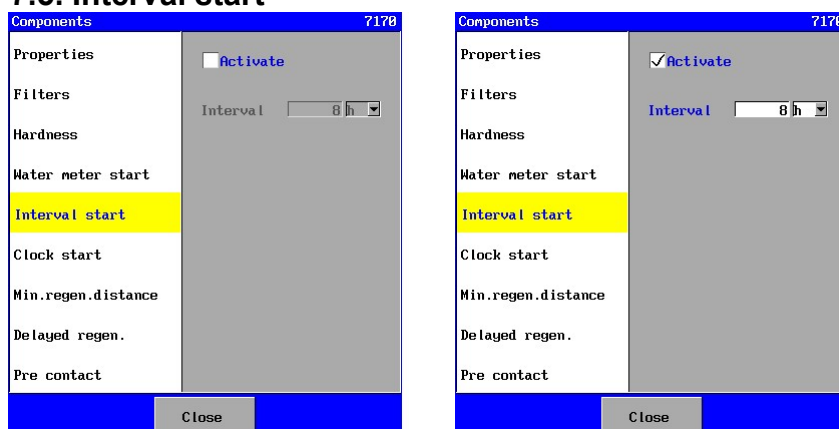
Regeneration can be initiated at fixed time intervals. This operating mode is selected if a water meter is not desired either because the water usage is regular and predictable or for operational reasons.

Sometimes this mode of operation is selected where there is a danger of micro organism formation within the unit due to a prolonged standby period. The facility is used to override volume dependant or quality dependant initiation.

When a regeneration starts depending on an interval time is activated, you will find in the lower bar of the main screen the information about the remaining time until the next regeneration.

Attention !
With installations utilising brine tanks it may be necessary to await the availability of full strength brine, the actual time will depend upon the type of brine system used but could exceed 4 hours.

7.6. Clock start

A regeneration can be started depending of the real time clock.
There is the possibility for programming three starting times at one day

When a regeneration starts, depending on the clock, is activated, you will find in the lower bar of the main screen the information about the next day and time the regeneration will start.

7.7. Minimum regeneration distance

Based on the capacity of the installation, the incoming water hardness and flow rate, the minimum time between two regeneration cycles can be calculated.

With installations utilising brine tanks it may be necessary to allow time for full strength brine to be produced, the actual time will depend upon the type of brine system used but could exceed 4 hours.

When there are very large requirements of water, for instance when filling a large tank, if this minimum time requirement if not taken into account and the plant may be insufficiently regenerated because of unsaturated brine.

If a water softener installation is also equipped with water hardness monitoring equipment, the minimum time period between regeneration's must be programmed. Otherwise, should there be a defect e.g. with the monitoring equipment the unit will continuously regenerate

You can determine whether the regeneration is to be carried out immediately
after the end of the 'minimum regeneration distance' ("Make up reg.") or whether the next regeneration has to be started manually.

When a minimum regeneration distance is activated, you will find in the lower bar of the main screen the information about the remaining time of this regeneration distance.

7.8. Delayed regeneration

Components	7200		Components	7200		Components	7200

Properties / Filters / Hardness / Water meter start / Interval start / Clock start / Min.regen.distance / **Delayed regen.** / Pre contact

Screen 1: Activate (unchecked), ☑Blocking, Mo Tu We Th Fr Sa Su (Mo ☑, We ☑), Time 7 0, Time 9 17, Close

Screen 2: ☑Activate, ☑Blocking, Mo Tu We Th Fr Sa Su (Mo ☑, We ☑), Time 7 0, Time 9 17, Close

Screen 3: ☑Activate, Blocking (unchecked), Mo Tu We Th Fr Sa Su (Mo ☑, We ☑), Time 7 0, Time 9 17, Close

A regeneration may be started at any time of the day but, for operational reasons, there may be times when regeneration would be undesirable e.g. the water pressure may be too low or demand may be high. In standby duplex mode, the standby unit will be brought into service and the exhausted unit will regenerate at the end of the prohibited period.

With "Blocking" you can determine whether the regeneration is inhibited within the day and time settings (blocking on) or a regeneration is allowed within the day and time settings (blocking off).

Blocking on :

Menu	Alarm	Start : Vol: 800,0 l	Blok : 09:17	Ma 09:09

Blocking off :

Menu	Alarm	Start : Vol: 900,0 l	Block : We 07:00	Mo 09:18

When a delayed regeneration is activated, you will find in the lower bar of the main screen the information about the blocking zone of the delayed regeneration.

7.9. Pre contact

Components	7210		Components	7210

Properties / Filters / Hardness / Water meter start / Interval start / Clock start / Min.regen.distance / Delayed regen. / **Pre contact**

Screen 1: Activate (unchecked), Percentage 80 %, Regen.start (unchecked), Close

Screen 2: ☑Activate, Percentage 80 %, Regen.start (unchecked), Close

It is sometimes necessary to give a warning or to signal to another unit before the duty water softener is exhausted.

This facility may be used to initiate regeneration of a simplex plant, and is used in conjunction with a prohibited regeneration period. Regeneration will start at a fixed time, the end of the regeneration prohibited time, but only after a predetermined volume of water has been treated.

This allows a quantity of treated water to be held in reserve for use the following day. For example with a capacity of 180 m³ and pre contact at 80% there would be a treated water reserve capacity of 36 m³. When less than 36 m³ of treated water capacity remains a regeneration will take place when the next permitted regeneration time is reached.

Attention !

Untreated water must not be allowed to reach the user, it is important that there be sufficient reserve capacity to provide water during the time between the pre contact and the delayed regeneration cycle.

8. Filter Unit

This chapter will examine the various phases of the filter unit.
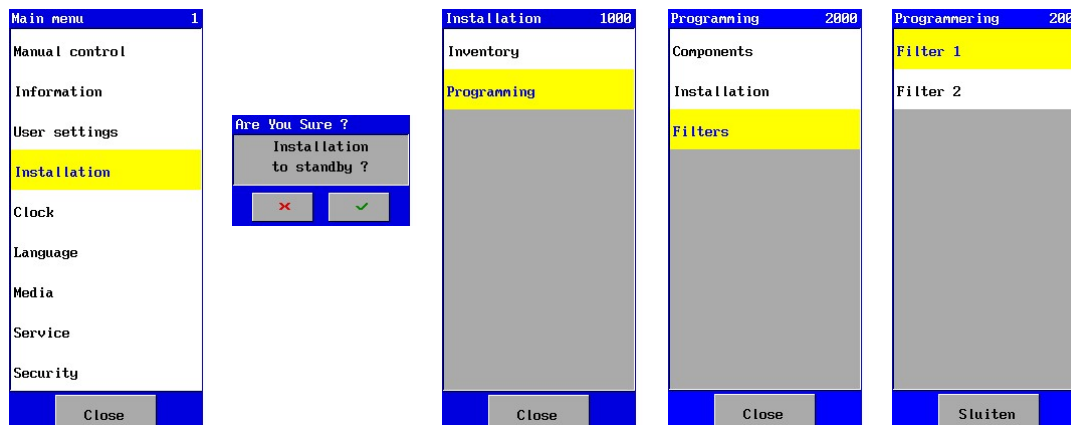
The manual control opportunities are explained in § 10 "Manual operation of the unit" on page 51.
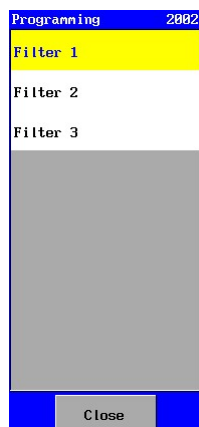
If there is a 3rd relay circuit board present the 3rd filter will be available.

8.1. Properties

The general characteristics with regards to the filter can be set in this window.

The exchange capacity will be shown here.
This setting is only programmable through the general installation settings. (see § 7.2 "Filters" on page 39)

8.2. Service

The service valve will be opened automatically when the filter is in the phase "Service" and it will deliver softened water to the system.

The production of softened water can be launched depending on the level switch (s) (HL and LL) or is switched on automatically when no level switch are available.

A rinse cycle can be activated (Time > 0) and you can enter what inputs or limits have to be monitored and what outputs have to be activated during this rinse phase. When controlling a filter with a EURO valve, the 2nd coil will be energized.

For each stage you can enter what inputs or limits have to be monitored and what outputs have to be activated. Not all functions will be shown as for example the service valve during the "steady" phase. These functions have a fixed settings (switch on or switched off) during the phase "Service" or "Service Rinse".

When a filter is exhausted it will be set to the phase "Regeneration".

Through manual options it is possible to switch the filter into "Regeneration" or into "Standby".
(see also § 10 "Manual operation of the unit" on page 51).

8.3. Service Stop

The service valve will be closed automatically when the filter is in the phase "Service Stop" and it will not deliver softened water to the system.

This phase will be switched depending on the level switch (s) (HL and LL) or is not available when no level switches are available.

For each stage you can enter what inputs or limits have to be monitored and what outputs have to be Activated. Not all functions will be shown as for example the service valve. These functions have a fixed settings (switch on or switched off) during the phase "Service Stop".

8.4. Regeneration

The regeneration fase consists of several parts. Those parts will be described in this chapter.
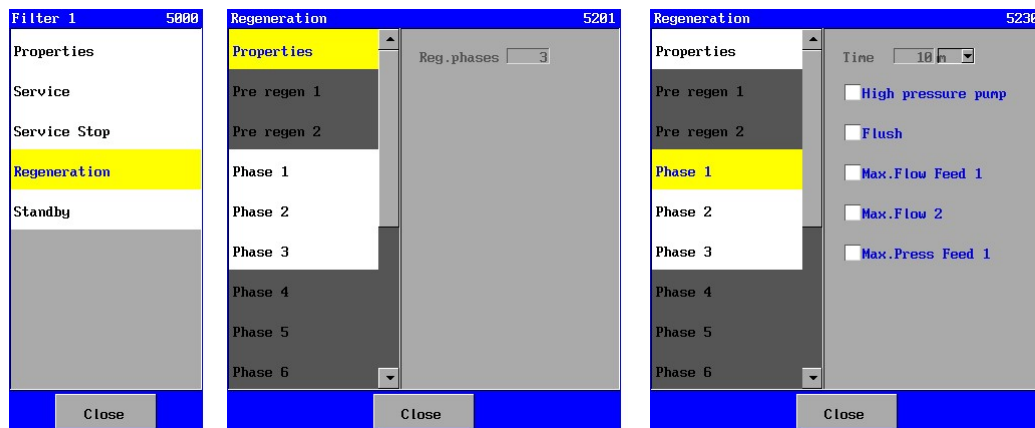
When all regeneration steps (number and duration) are the same for all filter, we advise you to enter these settings at the Installation settings (see § 7.2 "Filters" on page 39).
These settings are valid for all filters. The settings concerning activation of monitoring and outputs you will have to do in the following steps.

If you have set the time of a phase at zero then the functions are not programmable and the phase will also not be activated.

For each stage you can enter what inputs or limits have to be monitored and what outputs have to be Activated. Not all functions will be shown as for example the multi port valve. These functions have a fixed settings (switch on or switched off) during that phase.

Through manual options it is possible to fasten the regeneration or to directly stop the regeneration.
 (see also § 10 "Manual operation of the unit" on page 51).

8.4.1. Properties

Here you can enter the general settings of the filter.
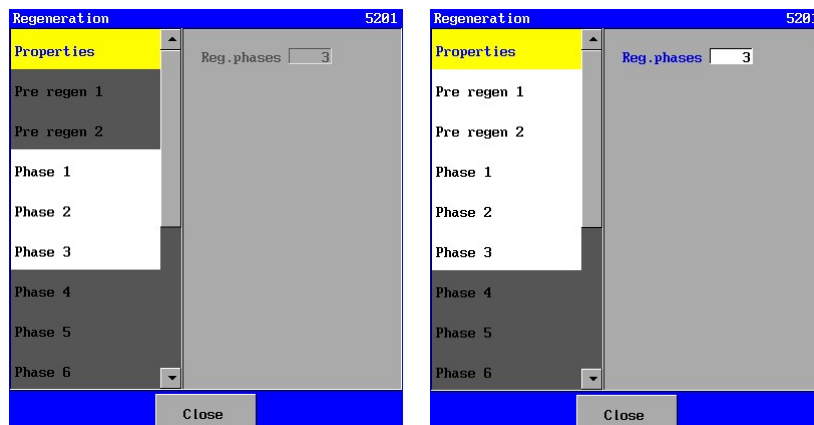
You can enter the number of regeneration steps here. When the regeneration is the same for each filter so you can enter these settings at the Installation settings (see § 7.2 "Filters" on page 39).

8.4.2. Pre regeneration 1

During this phase, the multi port valve will still be in the service position. The service valve will also still be opened.
If the installation is in alternating service, the standby filter will not be switched into service.
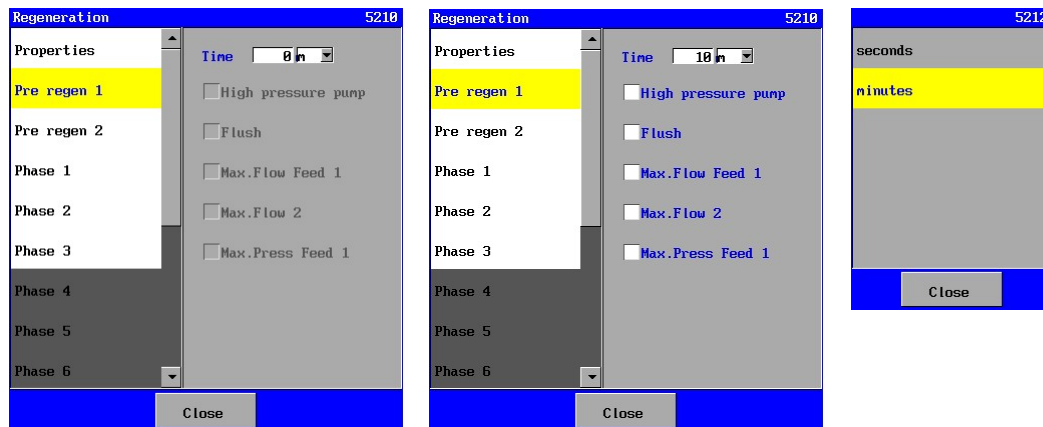
At the start of this phase there will be a check if there is already a filter in regeneration. If so,then this filter will switch to the step "Capacity exceeded".
There will be no check on the blocking options at this stage.

8.4.3. Pre regeneration 2

During this phase, the multi port valve will still be in the service position. The service valve will be closed.
If the installation is in alternating service, the standby filter will be switched into service.

At the start of this phase the blocking options will be checked (e.g. input Wait).

8.4.4. Regeneration
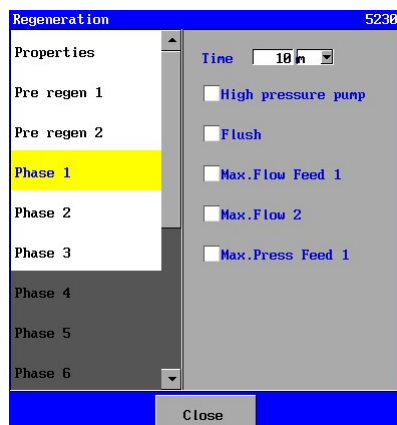
In total, 9 regeneration steps can be activated. Depending on the number of steps, these steps will be programmable.

When the phases "Pre regeneration 1" and "Pre regeneration 2" are not activated, the check on the blocking options and capacity exceeded will be done at the start of regeneration phase 1.

8.4.5. Post regeneration

The phase "Post regeneration" is, for example, meant for refilling the brine tank.

8.4.6. Home

The "Home" phase is meant for giving time to the motor of a Multi port valve to run to the service position.

8.4.7. Wait

If, at the start of the regeneration the blocking options are checked and the regeneration is prohibited so this filter will be switched into the wait position.

You can program if the service valve should be open or closed during this phase.
If the service valve was closed during a previous phase or when there is still a filter available to deliver softened water, the service valve will stay closed, whether or not the valve was programmed to be open during this phase.

This phase will be left automatically when all blocking option are not present any more or when the regeneration is, manually, forced to start or stopped directly.

8.4.8. Capacity exceeded

If, at the start of the regeneration, there was already an other filter in regeneration, so this filter will be switched into the position "capacity exceeded"..

You can program if the service valve should be open or closed during this phase.
The service valve will be closed when there is still a filter available to deliver softened water.

This phase will be left automatically when the other filter has ended its regeneration.

8.5. Standby

The service valve will be closed automatically when the filter is in the phase "Standby" and it will not deliver softened water to the system.
The filter will be switch into service when it has the highest priority (when two filters are in standby) and an other filter is switched into regeneration.

For each stage you can enter what inputs or limits have to be monitored and what outputs have to be Activated. Not all functions will be shown as for example the service valve. These functions have a fixed settings (switch on or switched off) during the phase "Standby".

Through manual options it is possible to switch the filter into "Regeneration" or into "Service".
(see also § 10 "Manual operation of the unit" on page 51).

9. Alarms

The controller features various monitorings of both the operation of the softener / filter unit and the operation of other functions in the controller (such as the SD card function).

9.1. General overview

The alarms can be recorded via an SD card, via e-mail or via an RS232 or RS485 connection.
The way the recording operates and can be set is described in
§ 16.4.1 "Alarm log function" on page 68 and later on in the chapter for the corresponding medium:

SD Card   : § 16.4 "Log functions" on page 67.
E-mail   : § 17.2 "Log functions" on page 71.
RS485   : § 18.2 "Log functions" on page 72.
RS232   : § 18.2 "Log functions" on page 72.

An alarm output can also be used to provide a warning. A lamp or a buzzer may be activated, for example. § 6.4 "Alarm" on page 22 features a description of the alarm output options and settings.

The "Information" option in the menu can be used to view the last 20 alarms. In this case the date and time are recorded as well as a short description of the alarm, while it is shown whether the alarm situation is active at that time or has been removed. See § 11.6 "Alarm history" on page 54 for more information.

Attention!
In the event of a fault in the configuration file with programming an alarm is invariably given. This cannot be set. In this case the controller has to be reset or a back-up may be uploaded via the boot software, if need be.

9.2. Alarm window

An alarm is given in the alarm window, showing the date and time.

When an alarm output is programmed and activated, this output can be switched off with key "Reset".

The warning can be deleted from the overview, if the cause of the alarm situation has been removed, by proceeding to the corresponding warning and pressing the key "Reset" again.

The warning remains in the overview when the corresponding monitoring is programmed so that the alarm output automatically switches off when the alarm situation is removed.

An alarm, in the alarm window takes the following form:

```
 Alarm messages                    2          Alarm messages                    2
 Wait              08-03-2018 13:25 Al.        Wait              08-03-2018 13:25 Al.
                   ***       ***    Ok                           08-03-2018 13:25 Ok




      Close               Reset                    Close               Reset
```

The window provides the following information:
- line 1 : - brief description of the alarm situation given.
            - date and time when the alarm occurs
              if "uu-uu-uuuu" and/or "uu:uu" is displayed here, then the clock did not get a valid value at
              the moment.
- line 2 : - date and time when the alarm is removed
               If the alarm has not yet been removed this is shown by "***".

```
 Alarm messages                    2
 Power failure     02-11-2009 12:00 Al.
                   20-09-2011 11:29 Ok




      Close               Reset
```

For example, it is possible to read off in the window the date and time the controller is switched off
(line 3) and when it is switched on again (line 4).

9.3. Overview alarms

Shortened display	Description
Backup settings	The last programming changes are not stored. The previous programming is loaded. Check the parameters or load an back-up through a SD Card.
Chem.tank empty	The chemical tank (brine tank) is empty.
Default settings	The configuration files on the hard disk are disabled or unavailable The controller has to be configured again or a back-up loaded.
Language file	The language file cannot be read. The English language will be loaded. You can load a backup through a SD Card.
Font file	The font file cannot be read. The standard font will be loaded. You can load a backup through a SD Card.
Multiple files	Multiple files can not be read. You can load a backup through a SD Card.
Email	A fault occurred when sending an e-mail.
Max. Flow	Maximum flow limit of measurement ...... exceeded.
Max. Pressure	Maximum pressure limit of measurement exceeded.
Min. Flow	Minimum flow limit of measurement undershot.
Min. Pressure	Minimum pressure limit permeate undershot.
Min.regen distance	Regeneration start within programmed distance from last regeneration
Delayed regen.	Regeneration start within programmed blockzone
Capacity exceeded	Regeneration start wanted while other filter already in regeneration
Pre contact	Programmed percentage of rest capacity reached
Maintenance	Maintenance has to be undertaken on the unit.
Wait	The wait switch is active after the set delay.
ROM settings	The configuration files on the hard disk are disabled or unavailable. The controller has to be configured again or a back-up loaded.
SD: Software Card	The SD card is not appropriate for the data logging or a back-up. The SD card contains original software or "OEM" software.
SD: Card full	Not enough disk space on the SD card
SD: Not present	No SD card available or this does not comply with the specifications.
Power failure	The controller has been switched off.
Set clock	The clock must be set at a valid date/time.
High pressure pump	Security switch of high pressure pump is activated.

10. Manual operation of the unit

```
Main menu        1
Manual control
Information
User settings
Installation
Clock
Language
```

The unit can be controlled manually.

The main menu's "Manual control" features an overview of the manual operations possible at that time.

The options for each phase are shown below.

10.1. Start regeneration

```
Manual control    100
Start regeneration
Start regen.standby
Reg.without reset
Filter change
```
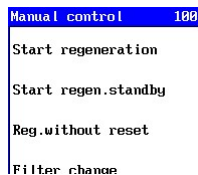
The filter in service (highest priority) will start a regeneration cycle.
This option will not be available when a filter is already in regeneration or waiting for a regeneration.

10.2. Start regeneration standby filter
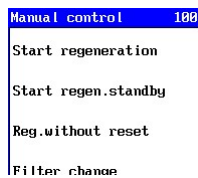
```
Manual control    100
Start regeneration
Start regen.standby
Reg.without reset
Filter change
```

The filter in standby (highest priority) will start a regeneration cycle.
This option will not be available when a filter is already in regeneration, waiting for a regeneration or when no filter is in standby.

10.3. Start regeneration without reset

```
Manual control    100
Start regeneration
Start regen.standby
Reg.without reset
Filter change
```
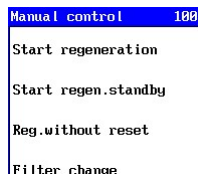
The filter in standby (highest priority) will start a regeneration cycle but the volume counter will not be reset after completing the regeneration.
This option will not be available when a filter is already in regeneration, waiting for a regeneration or when no filter is in standby.

10.4. Force regeneration

```
Manual control    100
Stop regeneration
Fast regeneration
Force regeneration
Filter change
```
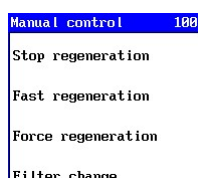
With a forced regeneration you will be able to start a regeneration while the filter is waiting for an automatic regeneration. For example when the input "Wait" is activated or during an other blocking situation.
When the regeneration was forced the inputs "Wait" and "Chemical tank level" will not be monitored anymore until the next regeneration.
This option will not be available when a filter is waiting for a regeneration.

10.5. Stop regeneration

```
Manual control      100
Stop regeneration

Fast regeneration

Force regeneration

Filter change
```

If a filter is in regeneration, you can stop the regeneration immediately by this option.
This option will only be available when a filter is already in regeneration.

10.6. Fast regeneration

```
Manual control      100
Stop regeneration

Fast regeneration

Force regeneration

Filter change
```

If a filter is in regeneration and you want to accelerate the regeneration time, you can start a fast regeneration. Every second the remaining time will be decreased by 60 seconds.
This option will only be available when a filter is already in regeneration.

10.7. Filter change

```
Manual control      100
Stop regeneration

Fast regeneration

Force regeneration

Filter change
```

With this option you can change over two filters from standby into service and vice versa.
This option will only be available when there is a minimum of one filter in service and one filter in standby.

11. Retrieve information
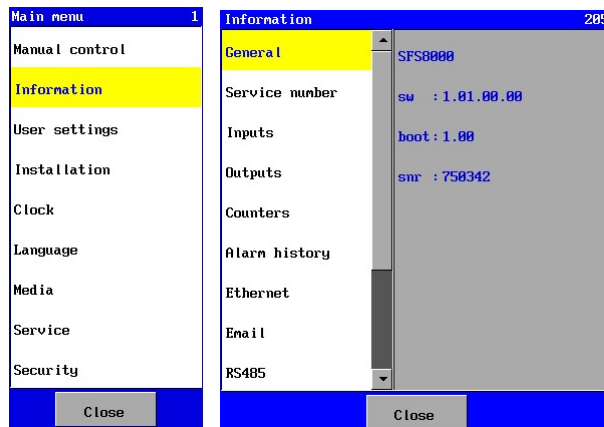
Various types of data can be retrieved from the information menu, such as: the Software version, the service telephone number, the number of service hours, the status of the inputs and outputs, the alarm history, the maintenance interval (if programmed).

The information menu is located in the main menu.

The various information windows are discussed in the following sections.

11.1. General
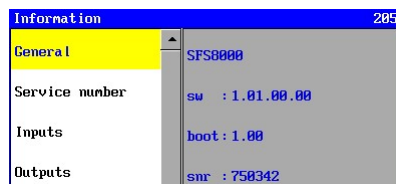
This window shows the Software version and the serial number.

The software is a combined package of various files (including language files) and the application software
- sw: software version of the complete software package
- ap: software version of the application software
- sn: serial number of the controller

The serial number is important for making a back-up on the SD card and for identification during communication (RS232, RS485, Ethernet).

11.2. Service number
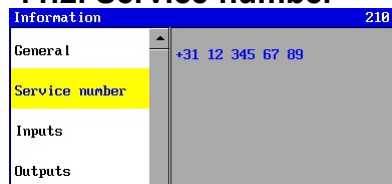
The window provides information about the service telephone number, which is programmable as described in § 24.1 "Service number" on page 87.

11.3. Inputs
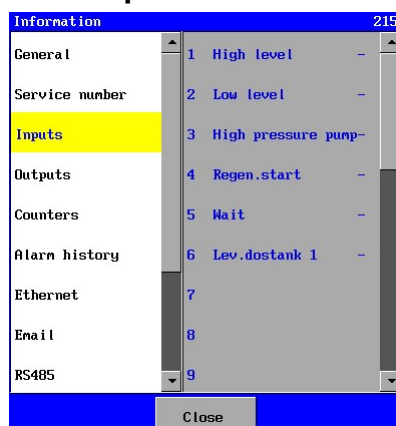
The window shows the status of the inputs.
A line is established as follows:
<number> <description > <status>

<number >	: indication of input on the print (1="IN 1")
<description >	: brief description of the function
<status>	: input status ("-" input is non-active, "|" input is active)

11.4. Outputs

```
Information                          220
General              1   CV 1              -
Service number       2   High pressure pump-
Inputs               3   CV 2              -
Outputs              4
Counters             5   CV 3              -
Alarm history        6   Service valve 3   -
Ethernet             7   Alarm 2           -
Email                8   Add.program 1     -
RS485                9   Add.program 2     -
                    Close
```
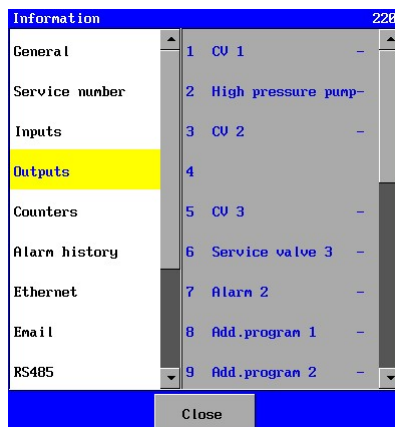
The window shows the status of the relay outputs.
A line is established as follows:
<number > <description > <status>

<number >   : indication of relay output on the print
                  (1="OUT 1")
<description >   : brief description of the function
<status>   : output status ("-" relay not activated, "|"
                  relay activated)

11.5. Counters

```
Information                          225
General              Water meter      0 m3
Service number       Maintenance      0 m3
Inputs
Outputs
Counters
Alarm history
Ethernet
Email
RS485
                    Close
```
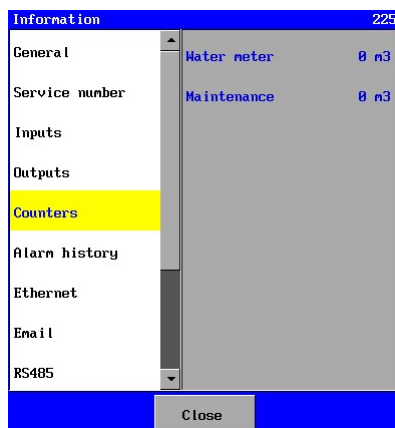
The window provides information about the number of counters.
The counters that will be shown are:

Water meter
This is a cumulative water meter showing the total number of m3 of softened water that is produced by the installation.

Maintenance
This counter indicates the total number of m3 of softened water that is produced by the installation since the last maintenance. If the counter is not activated it will not be visible.
See also § 24.2 "Maintenance" on page 87.

11.6. Alarm history

```
Information                          230
General              1  Max. CM Perm.
                        Aan
                        19-09-2011 13:56
Service number       2  Max.Flow Feed
                        Aan
Inputs                  19-09-2011 13:54
                     3  Panne courant
Outputs                 Arr.
                        19-09-2011 12:30
Counters             4  Panne courant
                        Mar.
                        02-11-2009 12:00
Alarm history        5  Panne courant
                        Arr.
Ethernet                19-09-2011 12:29
                     6  Panne courant
Email                   Mar.
                        02-11-2009 12:00
RS485
                    Close
```
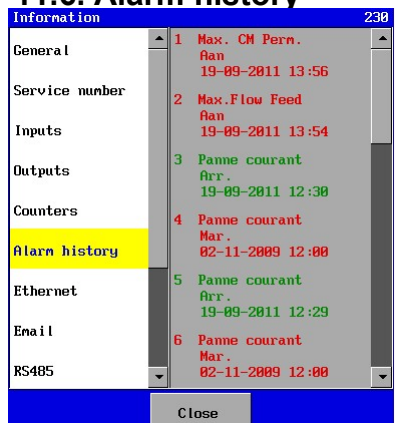
The window gives an overview of the last 20 changes in alarm situations. This means a warning will be provided about the occurrence and the removal of the alarm situation.

A warning is established as follows:

<number ><description >   : number   number of the alarm without any further meaning
                            description   brief description of the alarm situation
     <status>   : status   indicates whether the alarm that occurred at that time
                                          ("On") or was removed ("Off").
     <date > <time >   : date   date when the change occurred
                                      time   time when the change occurred

11.7. Ethernet

Information	235
General	IP: 0.0.0.0
Service number	NM: 0.0.0.0
Inputs	GW: 0.0.0.0
Outputs	HN: RCS8000
	MAC 00.00.00.00.00.00
Counters	Server
Alarm history	Port 80
Ethernet	Modbus
Email	Port 502
	Protocol TCP
RS485	
	Close

This item shows Ethernet settings that are relevant for internet and e-mail communications (see also § 15 "Ethernet" on page 61).

The windows show the following settings:

IP:	controller IP address.	HN:	Hostname
NM:	Net mask	PO:	Port number
GW:	Default gateway	MAC:	MAC address

Further the settings for the port number and protocol of the Modbus compatible function will be shown.

11.8. E-mail

Information	240
General	This option is not
Service number	activated or not
Inputs	present
Outputs	
Counters	
Alarm history	
Ethernet	
Email	
RS485	
	Close

It is possible in the controller to send an e-mail in the event of a specific (alarm) situation or when the situation is removed. An e-mail can be sent switched on or switched off (see § 17.1.1 "Switch on / off e-mail function " on page 70).

When switched off the following window is shown.

Information	240
General	Email :
	dummy@dummy.com
Service number	
	SMTP 213.75.63.13
Inputs	
Outputs	
Counters	

When switched on, the recipient address to which the e-mail warnings will be sent is shown. The SMTP address is also shown.
Further details about e-mail messages are featured in § 17 "E-mail" on page 70.

11.9. RS485

Information	245
General	Ser.nr. : 750342
Service number	Protocol : Modbus
Inputs	Baudrate : 9600
Outputs	Databits : 8
Counters	Parity : No
Alarm history	Stopbits : 1
Ethernet	Modbus
Email	Protocol : RTU
	Address : 1
RS485	
	Close

The controller type SFS8x1x-xxx routinely has a RS485 port.

Using this port, information can be sent to a PC, for example, by means of an RS232 / RS485 converter, which is not included in the delivery. The serial number is also displayed as this number is also used for identification for messages about the RS485 line.

The RS485 port-related setting can be programmed in this controller.

When the Modbus compatible function is activated so the programmed protocol and device address in the network will be shown.

11.10. RS232

The control type SFS8x1x-xxx has a RS232 port by default. Using this port, information can be sent to a PC, for example. This window displays the settings for the RS232 connection. The serial number is also displayed to identify messages across the RS232 line.

The settings regarding the RS232 port cannot be programmed freely in this control unit.

11.11. Recorder outputs

The currently transmitted current can be read on a recorder in this window. This option is only available if the corresponding optional print ca-3rec is present. If no window function is connected, then no text will be displayed and no current will be transmitted.

11.12. Inputs 0-20mA

This window allows reading the current incoming power supply on a 0-20mA input.

This option is only available when the accompanying optional print ca-fl-pr-3an is present. If there is no function connected to an input, no accompanying text will appear.

11.13. Print composition in the controller
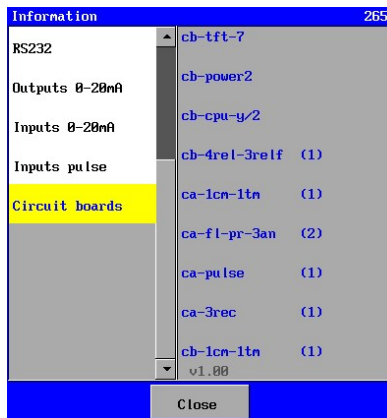
The controller comprises multiple PCBs (Printed circuit board).

The window shows what PCBs the controller consists of. This allows you to check if the PCBs are also actually being detected by the software.

The following PCBs may be displayed:
- cb-tft-7 : front circuit board for LCD display and touch panel
- cb-power2 : power supply circuit board
- cb-cpu-y/1 : cpu circuit board (SD kaart en 8 digitale ingangen)
- cb-cpu-y/2 : cpu circuit board (RS232, RS485, Ethernet, SD kaart and 8 digital inputs)
- cb-4relp-3relf(1): relay circuit board no.1 (4x relay output, 3x relay output)
- cb-4relp-3relf(2): relay circuit board no.2 (4x relay output, 3x relay output)
- cb-4relp-3relf(3): relay circuit board no.3 (4x relay output, 3x relay output)
- cb-8in (1) : basic measuring circuit board no.1 (8 digital inputs))
- ca-fl-pr-3an(1) : optional circuit board with 3 additional inputs (0-20mA)
- ca-fl-pr-3an(2) : 2nd optional circuit board with 3 additional inputs (0-20mA)
- ca-3rec (1) : optional print with 3 outputs (0-20mA)
- cb-4relp-3relf(2): relay circuit board no.2 (4x relay output, 3x relay output)
- cb-8in (2) : basic measuring circuit board no.2 (8 digital inputs))
- ca-fl-pr-3an(3) : optional circuit board on 2nd basic measuring board with with 3 additional inputs (0-20mA)
- ca-fl-pr-3an(4) : 2nd optional circuit board on 2nd basic measuring board with with 3 additional inputs (0-20mA)
- ca-3rec (2) : optional circuit board on 2nd basic measuring board with with 3 additional outputs (0-20mA)

.

12. User settings

12.1. LCD Display

The control unit has lighting in the LCD Display.
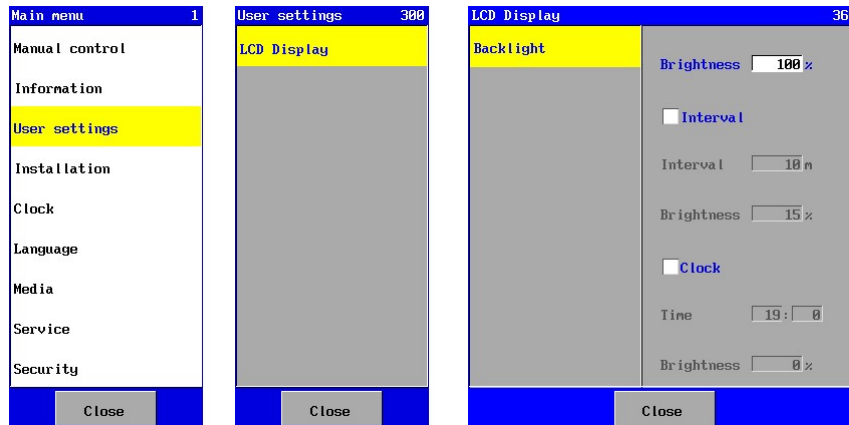
In this window you can specify the brightness of the lightning.
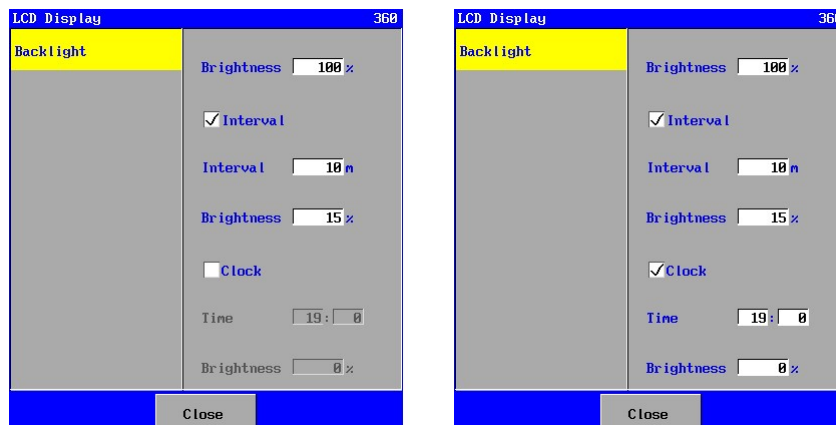
Furthermore you can specify in this window whether the lighting should be dimmed or switched off (=0%) when the touch panel is not used for longer than a certain period of time.

Also you can specify whether the whether the lighting should be dimmed or switched off (=0%) after a programmed time.
When the touch panel is used after this time, the lightning will be switched on for the selected interval time (when interval time activated). After this time, the dim level as programmed for the interval time will be activated.

13. Clock

13.1. General

The time and date can be set in the controller.
The time and date are used in various functions, such as data "logging".

The clock setting option is located in the main menu.

The controller has a battery so the time and date can be kept. If
the controller is switched on again the time and date have to be reset. In the case of summer time and winter time, the time and date have to be adjusted manually.

13.2. Time setting

The time setting window can be used to change the hours, minutes and time format. The general operation for entering a value (see § 4.3.1 "Set value or text" on page 10) is used to change the hours and minutes.

The general operation for making a choice from a list (see § 4.3.3 "Set dropdown list" on page 10) is used to change the time format.
There is a choice between a "12-hours" ("03:34 AM") and a "24-hours" format ("16: 54").

The changed time is directly up-to-date.
The time format will also apply directly. However, this is not stored when you quit the main menu.

13.3. Date setting

The date setting window can be used to change the years, months, days and the date format.
The general operation for entering a value (see § 4.3.1 "Set value or text" on page 10) is used to change the years, months and days.

The general operation for making a choice from a list (see § 4.3.3 "Set dropdown list" on page 10) is used to change the date format.

There are three formats to choose from.

The changed date is directly up-to-date. The data format will also apply directly. However, this is not stored when you quit the main menu.

The control unit also checks whether the date is correct (year> 2009).
If this is not the case, then a message will be displayed in the alarm window that the clock must be set.

14. Language setting
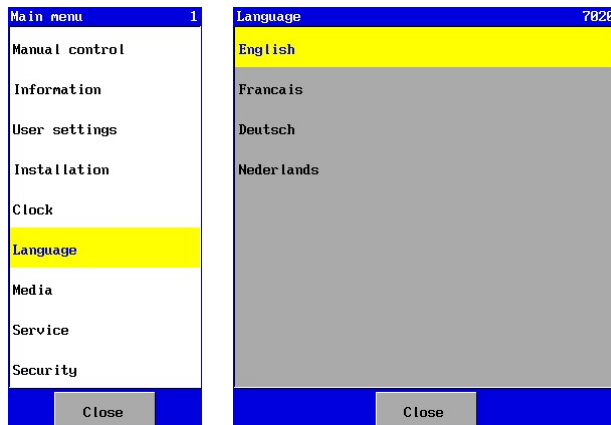
The controller offers you the opportunity to choose from different languages.

The language setting option is located in the main menu.

14.1. Change language setting
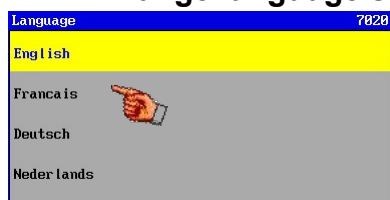
Select the required language.

You will then be asked to confirm your choice.

The texts in the menu are immediately changed in the changed language.
The language setting is not, however, stored after you quit the main menu.

15. Ethernet

Attention ! This chapter only applies to control unit type SFS8x1x-xxxx.

The controller is suitable for communicating via Ethernet. The web server on the controller allows information to be exchanged with the controller via a web browser (such as Internet Explorer) (see also § 23 "Internet" on page 83).
In order to adapt the controller the Ethernet connection has to be set correctly.

Main menu	1
Manual control	
Information	
User settings	
Installation	
Clock	
Language	
Media	
Service	
Security	
Close	

Media	8000
Ethernet	
SD Card	
Email	
RS485	
Harddisk	
RS232	
Close	

Ethernet	8100
Properties	
Server	
Modbus	
Close	
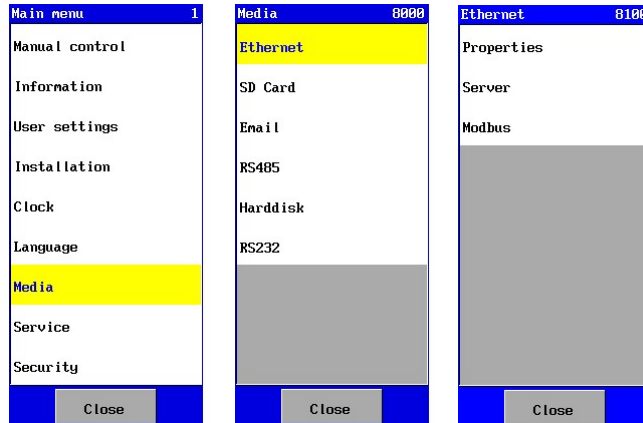
This chapter will explain how the Ethernet connection can be set.

The Ethernet menu is located in the main menu.

15.1. Configuration

15.1.1. DHCP function

Ethernet	8100
Properties	
Server	
Modbus	

Ethernet	8100
☑ Autom.IP (DHCP)	
IP	192 168 1 5
NM	255 255 255 0
GW	192 168 1 254

Ethernet	8100
☐ Autom.IP (DHCP)	
IP	192 168 1 5
NM	255 255 255 0
GW	192 168 1 254
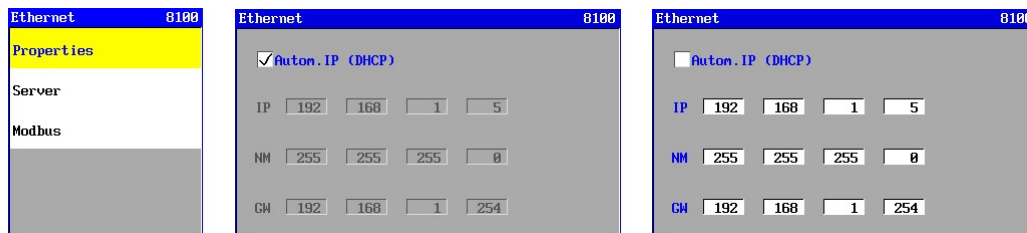
The controller has a "DHCP" function. This function is enabled when option "Autom.IP (DHCP)" has been activated. When the controller starts up, a check is made for roughly 5 seconds to see if a DHCP server is available on the network and if an IP address is automatically assigned. If there is no DHCP server the set IP address is used (see § 15.1.2 "IP address" on page 61). In that case the "Autom.IP (DHCP)" option should be turned off.
If the IP address is automatically assigned via an DHCP server, the IP address is read off via the information menu (see § 11.7 "Ethernet" on page 55).

15.1.2. IP address

The IP address is the controller's address within the network to which the controller is connected.
The first 3 numbers are normally the same for all connected components on the network.
The final number has to be unique within the network.

Ethernet	8100
☐ Autom.IP (DHCP)	
IP	192 168 1 5
NM	255 255 255 0
GW	192 168 1 254
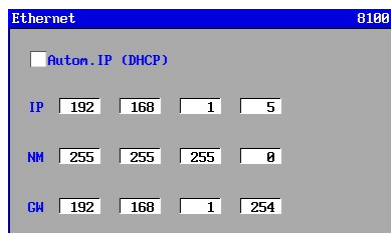
In the window the IP address is entered after "IP".

The controller also has a DHCP function (see § 15.1.1 "DHCP function" on page 61) to check if the controller is automatically assigned an IP address from a DHCP-server (in a router, for example).

If this is the case, the IP address set here is not used. The automatically assigned number can be read off in the information menu (see § 11.7 "Ethernet" on page 55).

15.1.3. Subnetmask

In the window the subnetmasker is entered after "NM".

This generally has to be set as 255.255.255.0, showing that the first 3 numbers of an IPaddress, within the network, have to be the same and the final number has to be unique.

15.1.4. Default gate-way

In the window the address of the standard gateway is entered after "GW".
The address has to be set in the IP address of the appliance (router or modem, for example) connecting the network with another network (such as the internet).

15.1.5. HTTP port number

The port number 80 is routinely used for the internet (World Wide Web).
The port numbers 1 to 1023 are officially reserved but may be set, if necessary.

The port number may have to be changed if, for example, 2 controllers are placed behind a modem or router that both have to be accessible via the internet. In the router or modem another port has to be earmarked for both controllers.
A corresponding port number then has to be entered in the window.

If a port number other than port 80 is used then a colon and port number have to be entered in the browser's URL bar, after the IP address or domain name. For example: 198.162.0.10:1024 for the use of port number 1024.

Attention!
The changed port number becomes active only if the controller is switched off and switched on.

15.1.6. Modbus

On the Ethernet port there is a Modbus compatible function available.
Here you can set the Modbus protocol, portnumber and de device address for the Modbus function in the network. See § 22 "Modbus" at page 80 for more information.

15.2. Access via internet (WAN)

Here it is indicated how the modem can be set to be granted access to the controls via the internet (WAN). It further describes how the IP address of the modem can be traced on the internet.
.

The modem is connected to two networks, namely the internet (WAN = Wide Area Network) and the local network (LAN = Local Area Network). The modem has an IP address in both networks. To gain access via the internet to the control, a so-called "NAPT entry" (Network Address Translation) must be created in the modem.

Thus the modem will know to which IP address in the local network the incoming messages are to be transmitted.

If the DHCP (DHCP = Dynamic Host Configuration Protocol) server is activated in the modem, the IP address of the controller (which is accessible via the internet) must be reserved ("DHCP lease"). The controls are then always assigned the same IP address. This is necessary because only a fixed IP address can be specified in the "NAPT entry" to control the internet access.

Below is a schematic example of a configuration. Here the "PC-1" and "modem-1", for example, are placed in the office of the supplier of the installation.

PC-2

SFS8000-1
IP : 10.0.0.4
Port : 80
GW : 10.0.0.138
MAC: 00.04.a3.20.73.aa

SFS8000-2
IP : 10.0.0.7
Port : 80
GW : 10.0.0.138
MAC: 00.04.f4.66.d3.bb

PC-1   Modem-1

Modem-2

WAN
IP : 84.86.9.96

LAN
IP : 10.0.0.138

NAPT
Entry 1 (SFS8000-1)
Inside IP : 10.0.0.4
Inside port : 80
Outside IP : .0.0.0.0
Outside port : 80

Entry 2 (SFS8000-2)
Inside IP : 10.0.0.7
Inside port : 80
Outside IP : .0.0.0.0
Outside port : 81

DHCP Lease
Entry 1 (SFS8000-1)
ID : 01:00:04:a3:20:73:aa
IP : 10.0.0.4

Entry 2 (SFS8000-2)
ID : 01:00:04:f4:66:d3:bb
IP : 10.0.0.7

Modem-3   SFS8000-3

WAN
IP : 55.0.152.23

LAN
IP : 10.10.10.254

NAPT
Entry 1 (SFS8000-1)
Inside IP : 10.10.10.141
Inside port : 80
Outside IP : .0.0.0.0
Outside port : 80

DHCP Lease
Entry 1 (SFS8000-3)
ID : 01:00:04:bb:43:a2:cd
IP : 10.10.10.141

SFS8000-3
IP : 10.10.10.141
Port : 80
GW : 10.10.10.254
MAC: 00.04.bb.43.a2.cd

Figure 14.1

Examples:

1) If you want to connect from your PC (PC-1) with control SFS8000-1 then you must enter the following in the URL bar of the internet browser:

84.86.9.96

2) If you want to connect from your PC (PC-1) with control SFS8000-2 then you must enter the following in the URL bar of the internet browser:

84.86.9.96:81
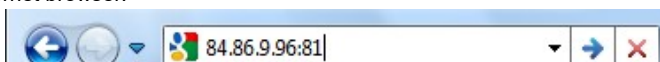
3) If you want to connect from your PC (PC-1) with control SFS8000-3 then you must enter the following in the URL bar of the internet browser:

55.0.152.23
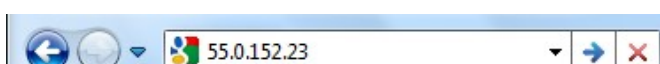
15.2.1. IP address of the modem (WAN)

The IP address of the particular modem on the internet can be obtained by inserting http://www.whatismyip.com in the URL bar of the browser on a computer that is connected to the local network "behind" the particular modem. A web page will appear with the IP address of the modem. This address must be used to access the control via the internet. If this is done on, for example, PC-2 (see Figure 14.1), then the IP address "84.86.9.96" will be displayed. This IP address is not adjustable.

15.2.2. IP address of the modem (LAN)

The modem is equipped with a specific IP address in the local network. This IP address can eventually be modified, but this is not really common. This IP address can be found in the instruction manual of the modem. The modem can subsequently be connected to a PC.
The IP address of the PC should be set so that it can communicate with the modem. To connect to the modem, the IP address of the modem must be entered in the URL bar of the browser (for example, Internet Explorer).

15.2.3. NAPT

A "NAPT Entry" ("Network address port translation") is to be set in the modem. This will give access to the control of the internet. The IP and port number of the control are specified in the "NAPT entry". See § 15.2.2 "IP address of the modem (LAN)" on page 64, how to make a connection between a PC and the modem.

If you have two controls in the local network that should be accessible via the internet, they must communicate via the internet through different ports. Standard communication is via port 80.
The modem will transmit the incoming messages (from the internet) directly to the control with a specific IP address and port number in the local network.

Example with a Speedtouch 520i modem:
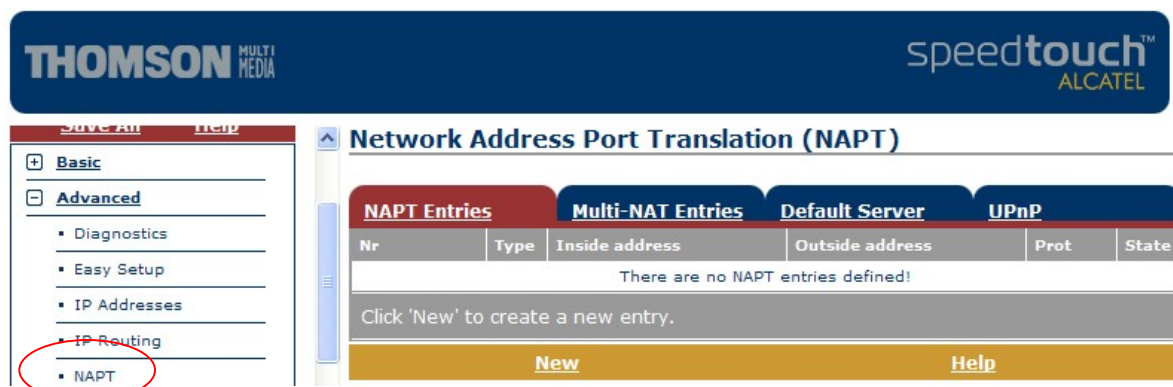
Open "Advanced" in the menu and click subsequently on "NAPT". Make a "NAPT Entry" by clicking on "New".

Enter the IP address (in this example: 10.0.0.4) and port number (in this example: 80) of the control that should be accessible via the internet.

If several controls should be accessible via the internet, then one should make use of the ports. The setting "Outside Port" should be set differently for each control. This port number should then be used in the URL bar of the browser of the PC (also see the examples given in Figure 14.1).

Save the settings by clicking on "Save All".

15.2.4. DHCP Lease

If the DHCP server in the modem is activated (see also § 15.1.1 "DHCP function" on page 61), a so-called "DHCP Lease" must be created. This establishes that the modem always assigns a fixed IP address to a particular device (in this case the control) in the local network. The IP address should be equal to the IP address (Inside IP) that is set in the "NAPT entry". See § 15.2.2 "IP address of the modem (LAN)" on page 64, how to connect a PC to the modem.

Example with a Speedtouch 520i modem:

Open "Advanced" in the menu and then click on DHCP. It is subsequently indicated in the "Server Config" window whether the DHCP server is enabled. If so, then the following steps must be performed.

Click on "Server Leases" and an overview of the set "Leases" will be displayed. Click on "New" to create a new "Lease".

Enter "01" in "Client ID" then and thereafter the MAC address (see § 10.7 "Ethernet" on page 35) of the control and enter the IP address of the control in the "Client IP Address". Then on "Apply".

The adjacent represented overview will now be displayed.

Save the settings by clicking on "Save All".

16. SD card

The SD card function can be used for various purposes such as changing application software, making "OEM" software, storing alarms, measurement data and process data.

This chapter will explain how this can be set and how the cards are organised in relation to the directory structure.

For the specifications of the SD cards see § 38 "Technical specifications" on page 109.

16.1. Arrangement of the cards

A separate card has to be created for each SD card application.
The following types of cards may be distinguished:
- cards with original software
- cards with "OEM" software
- cards with software back-ups and log files

One card type may display data about different types of controllers.
For example, one card with original software may feature the original software of both type SFS8000 and for example type RGS8000 controllers, etc….

The distinction is made to keep the cards of the installer (OEM) and end user separate. A SD card can also be kept in which only original software is placed.

16.2. Directories

Below is a description of where the files are stored on a SD card.
The files are invariably stored in pre-defined directories.

The directory structure is as follows:

Original software   : X:\ <controller type > \ software \ original \ Vxxxxxx_xx
OEM software   : X:\ <controller type > \ software \ oem \ Vxxxxxx_xx
Back-up software   : X:\ <controller type > \ software \ back-up \ Vxxxxxx_xx_jjmmdd
Alarm log files   : X:\ <controller type > \ log \ <ssssss> \ alarm
Data log files   : X:\ <controller type > \ log \ <ssssss> \ data
Process log files   : X:\ <controller type > \ log \ <ssssss> \ process

Explanation:
X:\   = Main directory of the SD card
Vxxxxxx_xx   = Software version number
Vxxxxxx_xx_jjmmdd   = Software version number with date of the back-up
<controller type >   = for example SFS8000, RGS8000, etc…
<ssssss>   = The controller's serial number. Each serial number consists of 6 digits

Attention!
Any departure from this directory structure could result in the software failing to identify the card so the card's data cannot be read.

16.3. Software files

The controller is routinely delivered with the latest Software version (at that time).
If further changes are subsequently made in the software the software may be adapted by copying the original software to a SD card and loading via the Boot program in the controller (see § 28 "Boot software" on page 96). Get in touch with your supplier to obtain the latest version.

Once the original software is loaded, the controller will be reset to the factory settings.
You need to reset the controller with the settings you require.

After the settings have been changed, these settings may be stored together with the software as a back-up. The back-up may be used, for example, to secure the settings of a, normally, properly functioning unit, prior to making settings or software-related changes.

To make a back-up see § 20.2 "Back-up by the end user " on page 75.
If the back-up made has to be replaced you may use the
boot program again (see § 28 "Boot software" on page 96).

16.4. Log functions

There are three types of log functions: alarm logging, data logging (status / measurements) and process information logging. As for how these can be set, first of all the SD card function has to be switched on to access the log functions. See the windows below.
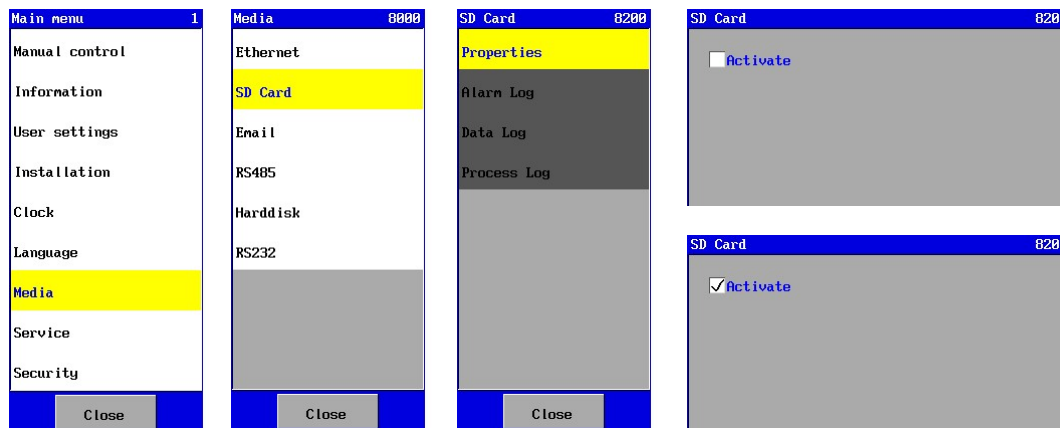
Attention!
The SD card function has to be switched off before the SD card can be removed from the controller.

This is to prevent the files from becoming unreadable.
Files in XML format are therefore correctly closed.

16.4.1. Alarm log function

If an (alarm) warning has occurred in the system, the warning may be
stored in the SD card. The "Alarm Log" option then has to be chosen in the "Log" menu.
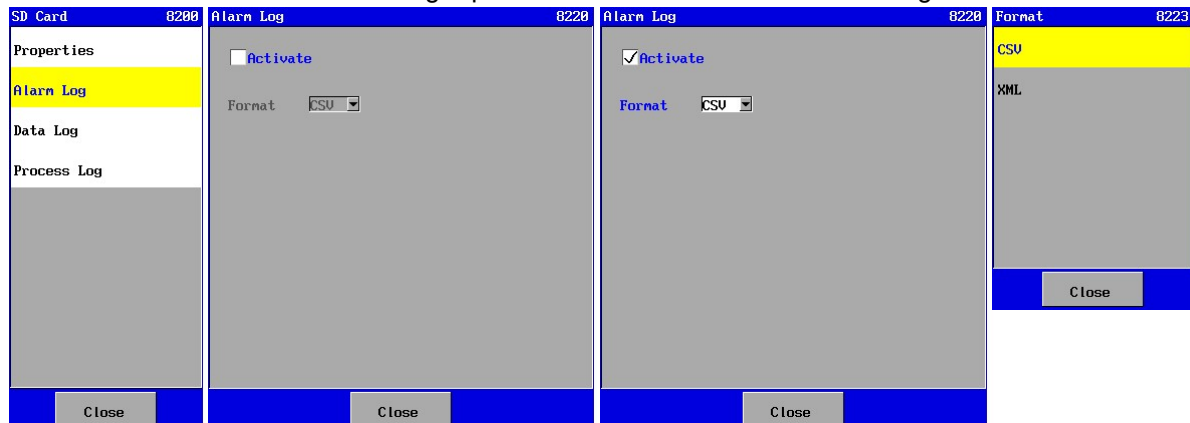
The alarm log function can be activated via this window and the "format" of the information sent can
be specified. The information can be stored in CSV format and in XML format .

The size of the file may vary somewhat. About 100 bytes can be counted for each alarm.

For more information about the log function, see § 21.1 "Alarm " on page 76.

16.4.2. Data log function

In order to check the quality of the water at a later time, for example, the measurement value can be
logged.
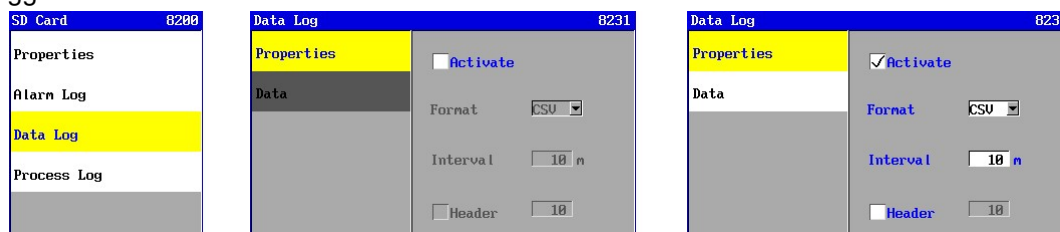
Towards this end, the data log function has to be activated (in "Properties" option).
CSV: For all data logging roughly 100 kB a day.
XML: For all data logging roughly 200 kB a day.

Properties
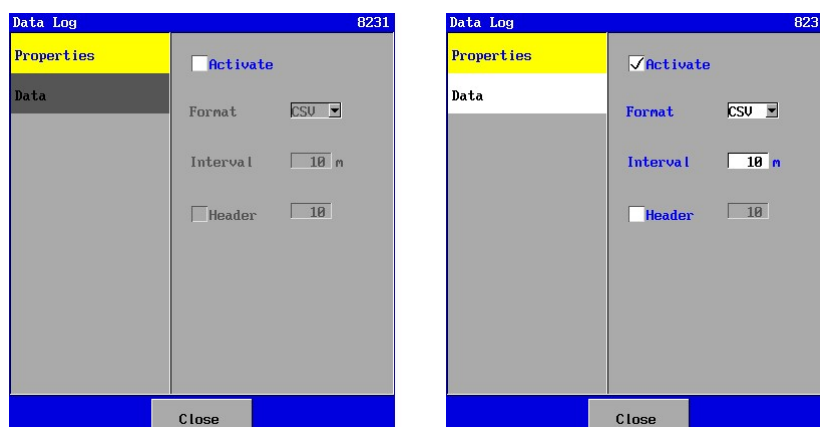
The "Properties" option is used to activate the data log function and to specify the "format" of the
stored information. The information can be stored in CSV format and in XML format .
An interval time of between 1 and 9999 minutes may be specified for logging.
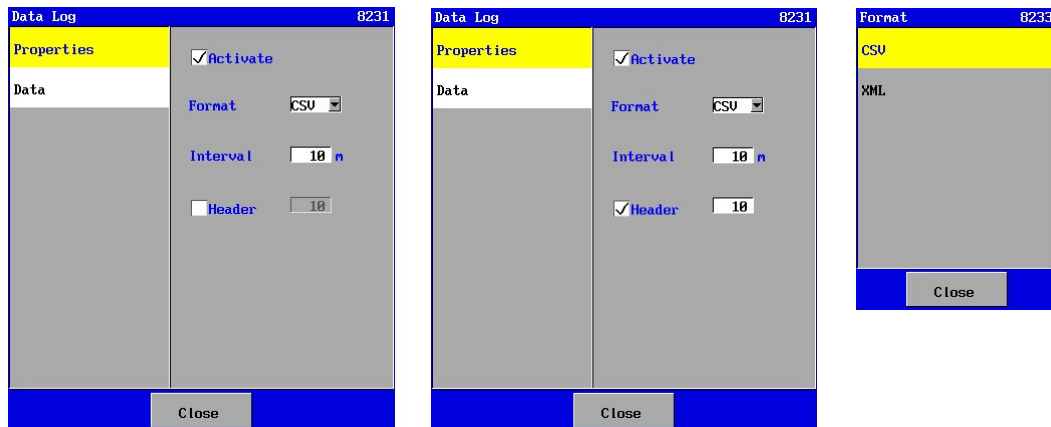
The "Header" field (appears only if the CSV format is set) can be used to indicate if an information line has to be added after a specific number of lines with status / measurement information (in the above example after 10 lines). An interval of between 1 and 999 lines may be specified. The data is separated by a comma.
For more details about the log functions and the format type see § 21.2 "Data information" on page 77.

Data

The "Data" option is for setting which data is logged.

For this the field of the corresponding function has to be "checked". The status of the measurement value of the corresponding function will then be featured in the information line.

16.4.3. Process log function
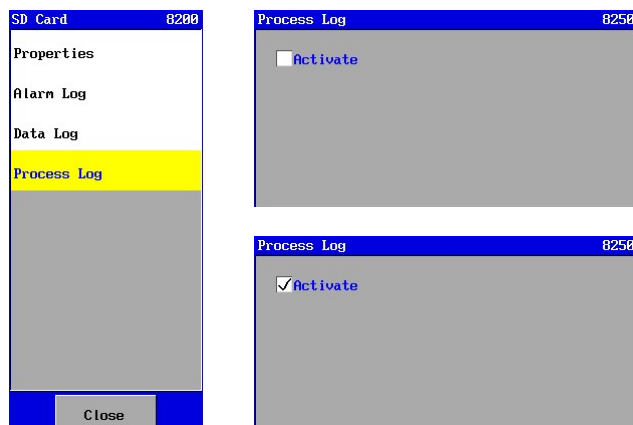
This window can be used to activate the process log function. The data is stored in ASCII format and cannot be set. The format appears as follows:
          date time unit (sub) process

If the controller has been voltage free this is also indicated in the file, with the date and time the controller was switched on and off.
The size of the file may vary somewhat. Roughly 50 bytes can be counted on for each process change or power failure.
For more information about the log function see § 21.3 "Process data" on page 79.

17. E-mail

Attention ! This chapter only applies to control unit type SFS8x1x-xxxx.
Attention ! A server without authentication (and without SSL) should be used.
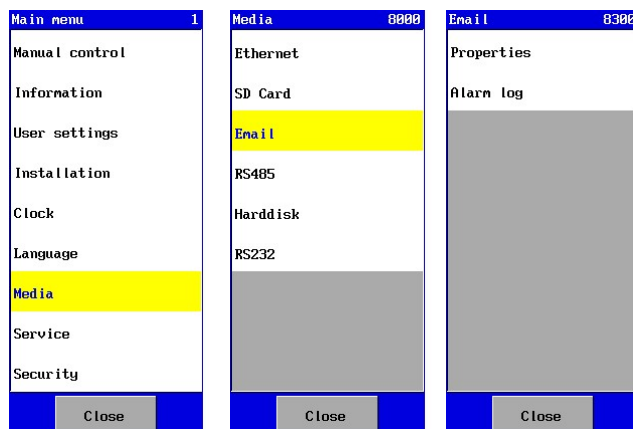
The controller can be used to send e-mails with (alarm) warning.
The options will be explained in this chapter as well as how the controller has to be set.

The e-mail menu is located in the main menu.

The configuration can be set via the "Properties" option.
The situation in which an e-mail is sent can be set via the "Log" option.

17.1. Configuration

To send e-mails a number of parameters have to be set in the controller.
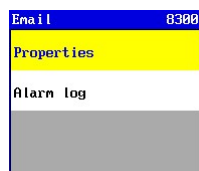
In this window the following items have to be set:
- Switch on / off e-mail function
- E-mail address of the recipient
- IP address of SMTP-server

17.1.1. Switch on / off e-mail function
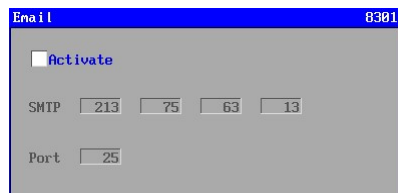
The e-mail function can be switched on and off in the window via the "Activate" option.

If the option is "checked" the function is switched on and the various programmable settings are accessible.

17.1.2. IP address of SMTP server

To send an e-mail the IP address of the internet provider's SMTP-server is required
for the local internet connection. This should be a server without authentication (and without SSL).
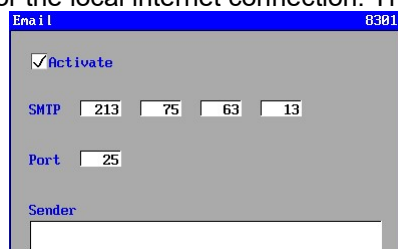
Generally speaking, only the domain name of the SMTP-server is known. This can be found in your "e-mail account", for example (such as "Outlook"), the address specified in the SMTP-server.

http://www.whatsmyip.org/whois/, for example, allows you to search for the related IP address of the
SMTP server by entering the domain name.

17.1.3. E-mail sender

The controller will send an e-mail with a programmable sender name
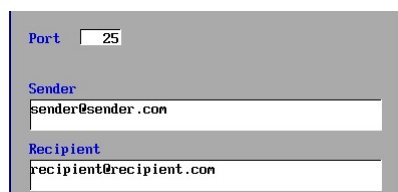
An e-mail address with up to 55 characters may be entered.

17.1.4. E-mail address of the recipient

Port	25

Sender
sender@sender.com

Recipient
recipient@recipient.com

There is an option to enter the e-mail address of the recipient (where the controller has to send the-mails).

An e-mail address with up to 55 characters may be entered.

17.2. Log functions

If an (alarm) warning has occurred in the system a warning can be given via e-mail. The "Log" option then has to be chosen in the "Email" menu.

Email	8320

This option is not

activated or not

present

17.2.1. Alarm log function

If an (alarm) warning has occurred in the system a warning can be given via e-mail. The "Alarm Log" option then has to be chosen in the "Log" menu.

Email	8300
Properties	
Alarm log	

Alarm Log	8321
Properties	☐ Activate
Alarms	Format CSV

Alarm Log	8321
Properties	☑ Activate
Alarms	Format CSV

If the alarm log function is activated (in "Properties") option the "Alarms" option will be automatically displayed.

Properties
The "Properties" option allows the alarm log function to be activated and the "format" of the information sent to be specified (only the CSV format is available at the present time).

Alarm Log	8321
Properties	☐ Activate
Alarms	Format CSV

Alarm Log	8321
Properties	☑ Activate
Alarms	Format CSV

The message in the e-mail is established as follows:
  date, time, status of the warning (on/off),description of the warning,
  phase where the warning occurred (where relevant).
For more information about the log function see § 21.1.1 "CSV format" on page 76.

Warnings

Alarm Log	8326
Properties	☑ Email
Alarms	☑ Brinetank empty
	☑ Min.regen distance
	☑ Delayed regen.
	☑ Capacity exceeded
	☑ Pre contact
	Close

The "Alarms" option can be used to set which (alarm) warnings will require an e-mail to be sent.

For this, the field for the corresponding warning has to be "checked".
An e-mail will then be sent at the time the situation occurs and when the situation is removed.

18. RS485

Attention ! This chapter only applies to control unit type SFS8x1x-xxxx.

Main menu	1		Media	8000		RS485	8400
Manual control			Ethernet			Properties	
Information			SD Card			Log	
User settings			Email			Modbus	
Installation			**RS485**				
Clock			Harddisk				
Language			RS232				
Media							
Service							
Security							
Close			Close			Close	
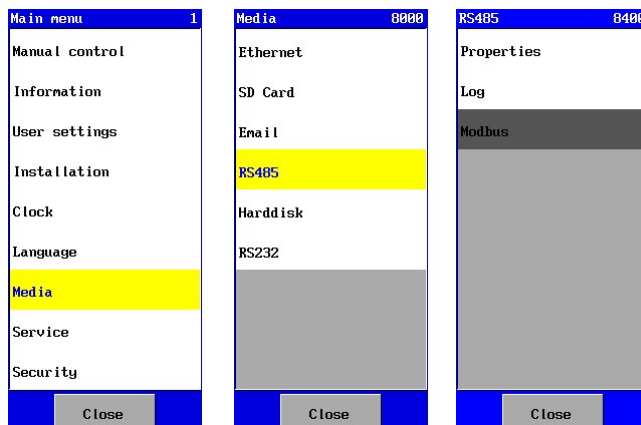
The controller has an RS485 connection.

The RS485 connection can be used for data logging (status / measurement), alarms and process data. This chapter will explain how this can be set.

The RS485 menu is located in the main menu.

18.1. Configuration

18.1.1. Configuration in the controller

The configuration of the RS485 connection is programmable.
The default connection is configured as follows:
- Baudrate   9600 Baud
- Data bits   8
- Parity   No
- Stop bits   1

RS485	8400		Properties	8401		Protocol	8403
Properties			Protocol	Log		**Log**	
Log			Baudrate	9600		Modbus	
Modbus			Databits	8			
			Parity	No			
			Stopbits	1		Close	
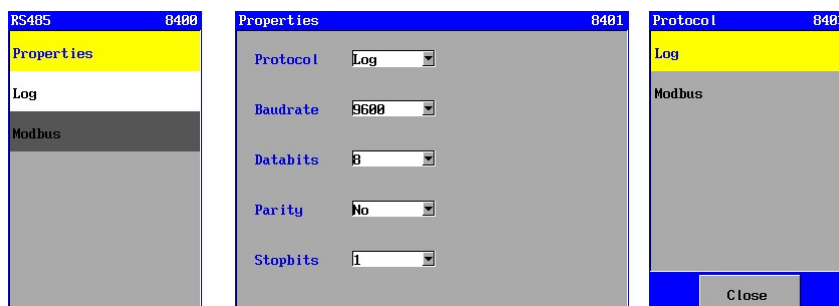
Also you can set the protocol that should be activated on the serial line. There is a choice between the log functions and the Modbus compatible function.

18.1.2. Configuration of the "Hyperterminal"

The controller can be connected with a PC by means of an RS232 / RS485 converter, which is not included in the delivery. For example, a "Hyperterminal" can be used to consult and possibly store the data sent by the controller. "Hyperterminal" is routinely available in
"Windows" under "Desktop accessories – Communications".

18.2. Log functions
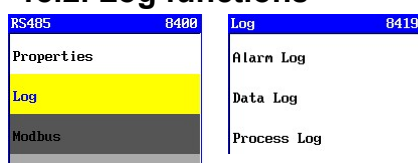
RS485	8400		Log	8419
Properties			Alarm Log	
Log			Data Log	
Modbus			Process Log	

There are three types of log functions: alarm logging, data logging (status / measurements) and process information logging. Below is an explanation of how these can be set.

18.2.1. Alarm log function

If an (alarm) warning has occurred in the system a warning may be given via the RS485 connection on a PC, by means of an RS232 / RS485 converter, which is not included in the delivery.

The "Alarm Log" option then has to be chosen in the "Log" menu.
The alarm log function is activated in this window and the "format" of the information sent can be specified (only the CSV format is possible at the present time).

date, time, status of warning (on/off),description of the warning,
phase where the warning occurred (where relevant).

For more information about the log function see § 21.1.1 "CSV format" on page 76.

18.2.2. Data log function
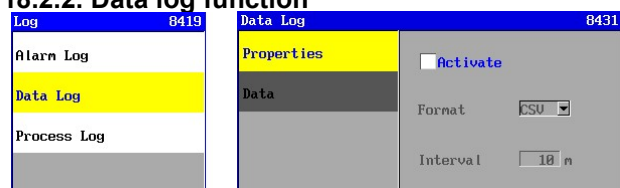
In order to check the quality of the water at a later time, for example, the measurement value can be logged.

Towards this end, the data log function has to be activated (in "Properties" option).

Properties
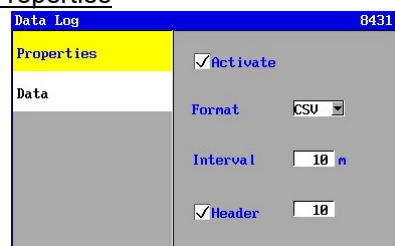
The "Properties" option is used to activate the data log function and specify the "format" of the information sent (only the CSV format is possible at the present time).

An interval time of between 1 and 9999 minutes may be specified for logging.

The "Header" field (appears only if the CSV format is set) can be used to indicate if an information line has to be added after a specific number of lines with status / measurement information (in the above example after 10 lines). An interval of between 1 and 999 lines may be specified. The data is separated by a comma.

For more details about the log functions and the format type see § 21.2.1 "CSV format" on page 78.

Data
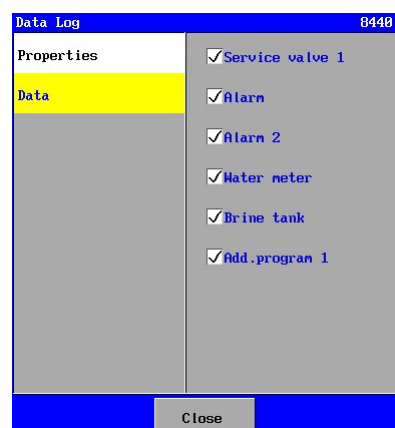
The "Data" option is for setting which data is logged.

For this the field of the corresponding function has to be "checked". The status of the measurement value of the corresponding function will then be featured in the information line.

18.2.3. Process log function
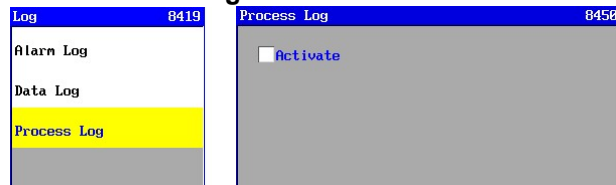
This window can be used to activate the process log function.

The data is sent in ASCII format and cannot be set. The format appears as follows:

date time unit (sub) process

If the controller has been voltage free this is also indicated in the file, with the date and time the controller was switched on and off.

For more information about the log function see § 21.3 "Process data" on page 79.

18.3. Modbus
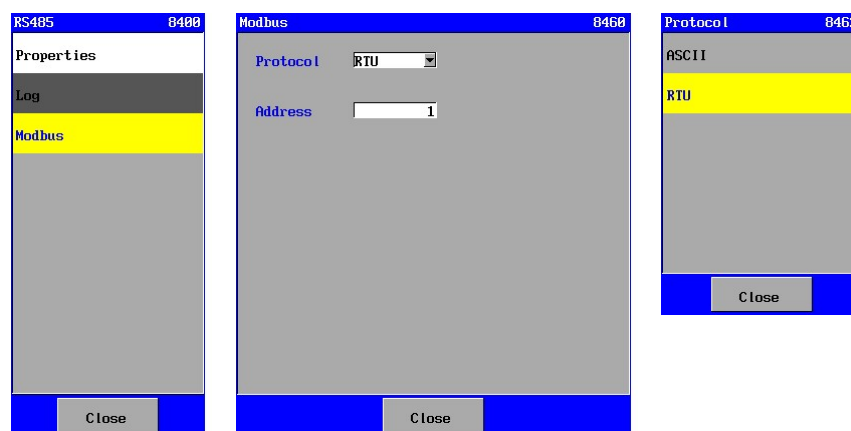
On the RS485 line you have the possibility to activate a Modbus compatible function (see "Properties"). The protocol and the device address in the network can be set. See § 22 "Modbus" at page 80 for more information.

19. RS232

Attentie ! Dit hoofdstuk is alleen van toepassing voor de besturing type SFS8x1x.
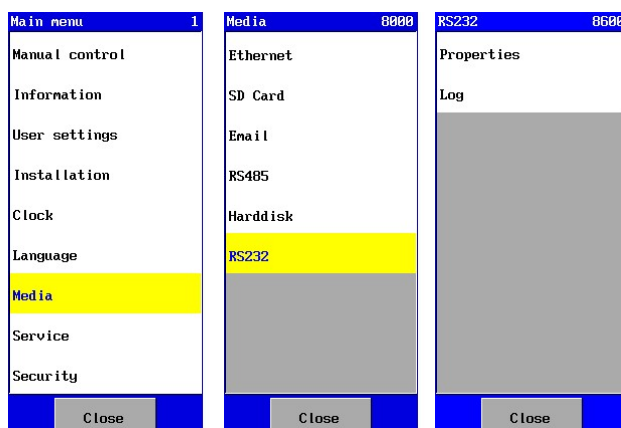
The control unit has a RS232 connection. This RS232 c onnection can be used for logging data (status/measurements), alarms and process data.

The settings and options for the RS232 connection are equal to the options for the RS485 connection. How everything can be set can be seen in chapter § 18 "RS485" on page 72 .

In that case the screen number needs to be increased by 200 each time.

20. Hard disk

The controller features a memory used as a hard disk.
When software files are being installed items such as languages and web pages are written to the disk. The settings are also stored here as well as the last 20 alarms .

The hard disk data may be copied to a SD card.

There are two copying functions:
         - Copying function for the fitting contractor
         - Copying function for the end user

20.1. Back-up via the fitting contractor

This can be done by the fitter for standard units, which nearly always have to be set the same, so the settings have to be made only once after the new software in installed. These can then be stored on a separate SD card with OEM software, see also "SD card" on page 66 (§ 16.1 t/m § 16.3), The SD card can then be used to copy the data to corresponding units.

§ 24.5 "Hard disk" on page 88 describes how "OEM back-up" can be achieved.

20.2. Back-up by the end user
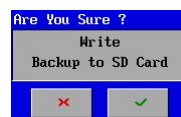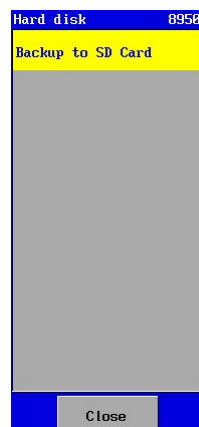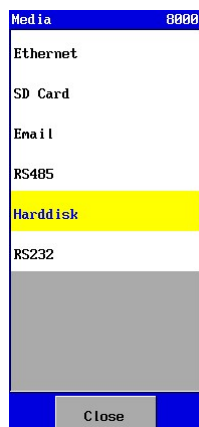
The end user may also make a back-up. A SD card on which no original software or "OEM software" is stored is placed in the SD card holder, see "SD card" on page 66 (§ 16.1 t/m § 16.3).

The back-up can be made via the "Media" menu. If the window of the "Harddisk" option is opened, the back-up can be made.

21. Logging

The controller allows various data to be logged
The data may be written to a file on the SD card or sent via e-mail, RS232 or RS485.

The following data may be singled out:
- Alarm data
- Data information (measurement and status data)
- Process data

Depending on the medium used, alarm and data information may be generated in the following formats:
- CSV format   can be imported into Excel
- XML format   can be directly read off in Excel (e.g. Excel 2007).

The process data is recorded in a fixed text format.
The following table shows what data can be recorded for each medium and what recording format is available.

	CSV	XML
RS485 / RS232		
Alarm	●	○
Measurem. / states	●	○
SD Card		
Alarm	●	●
Measurem. / states	●	●
E-mail		
Alarm	●	○
Measurem. / states	○	○

21.1. Alarm data

Alarms that are given can be recorded via various media (SD card, e-mail or a serial port (such as RS232 or RS485). Alarms are routinely recorded.

Alarms are recorded including the date and time the alarm occurred.
The moment when the alarm situation was removed is also recorded.

21.1.1. CSV format

If the alarms are recorded in CSV format the structure will be as follows:
<Day -Month-Year>, <Hour: Minute>, <On/off >, <Warning >, <Process>

Example:
09-01-2009,13:15, On, Power failure
09-01-2009,13:30, Off, Power failure
09-01-2009,15:30, On, Wait (Filter 1: Regeneration 1)

It can be seen from the above data that controller failed on 9 January 2009 at 13:15 and switched on again at 13:30. At 15:30 there was an wait alarm during the regeneration process of filter 1.

Example of a file name:
AL100204.CSV : This file contains alarm log data from 04-02-2010 in CSV format.

21.1.2. XML format

If the alarms are recorded in XML format the structure will be as follows:

      <standard XML header>(= <?xml version="1.0" encoding="UTF-8"?>)
      <data>
       <object *<date > <time > <status> <warning > <process>* />
      </data>

Example:

      <?xml version="1.0" encoding="UTF-8"?>
      <data>
       <object Date="09-10-2009" Time="13:30" Alarm="Off" Warning ="Power failure " />
       <object Date="09-10-2009" Time="13:30" Alarm="Off" Warning ="Wait, Filter1 : Regeneration1 " />
      </data>

      It can be seen from the above data that controller was activated on 9 January 2009 at 13:30.
      In the case of an wait alarm, for example, the warning also shows the
      phase (such as Regeneration 1) and filter (such as Filter 1) when the alarm occurred.

Example of a file name:
AL100204.XML : This file contains alarm log data from 04-02-2010 in XML format.

Attention!
If XML format is used for storage on an SD card, the file can no longer be used if the alarms logger is switched off or the SD card is deactivated. See § 16.4 "Log functions" on page 67 for more information about the switching on and off of the SD card.

21.2. Data information

The data information (measurement and status data) can be recorded via various media (SD card or serial port (bv.RS485)). The type of data and the type of format (only for SD) can be set separately for each medium. The data is recorded including the date and time.

The data is indicated as follows:
      - Valves, pumps, alarm and extra program
            0 = turned off,
            1 = turned on
      - Switches
            1 = not active,
            2 = active but has not passed delay time
            3 = still active after delay time
      - Tanks (clean water tank and brine tank)
            0 = empty
            2 = half full
            3 = full
      - Measurements (flow, pressure)
            Measured value is indicated.

21.2.1. CSV format

If the data is recorded in CSV format the structure will be as follows:
<Day -Month-Year>, <Hour: Minute>, <Data 1> …..<Data n>

When the controller is started up or the record is activated a "header" is first of all produced to indicate what the corresponding data means. You can set whether the header should be repeated after a number of data lines. See § 16.4.2 "Data log function" on page 68 (SD Card) and § 18.2.2 "Data log function " on page 73 (RS485).
The header shows what component the recorded data refers to.

The header line is established as follows:
Date, Time, xx, yy, zz,……
xx, yy, zz, ….. are abbreviations of the selected logging functions.
For information about the abbreviations used see § 30 "Terminology" on page 99.
The information line is established as follows:
Date, Time, aa, bb, cc, …..
aa, bb, cc, ….. are the status or measurement data.

Example:
Header   : dd-mm-yyyy,hh:mm,SV1, SV2, FLF, …., FI1, FI2
data   : 27-01-2010,08:55,1, 0, 2.3, …, Service, Standby

On 27-01-2010 at 08:55 the service valve 1 was opened, service valve 2 was closed, the measured flow was 2.3 (m3/h), Filter 1 was in service and Filter 2 was in standby.

Example of a file name:
VL100204.CSV : This file contains data log data from 04-02-2010 in CSV format.

21.2.2. XML format

If the alarms in XML format are recorded the structure will be as follows:
<standard XML header>(= <?xml version="1.0" encoding="UTF-8"?>)
<data>
 <object *<date > <time > <data1> <data2> …. <process>* />
</data>

Example:
<?xml version="1.0" encoding="UTF-8"?>
<data>
 <object Date="27-01-2010" Time="08:55" SV1="1" SV2="0" FLF="2.30" FI1="Service" FI2="Standby" />
</data>

On 27-01-2010 at 08:55 the service valve 1 was opened, service valve 2 was closed, the measured flow was 2.3 (m3/h), Filter 1 was in service and Filter 2 was in standby.

Example of a file name:
VL100204.XML : This file contains data log data from 04-02-2010 in XML format.

Attention!
If the XML format is used for storage on an SD card, the file can no longer be used if the data logger is switched off or the SD card is deactivated.

See § 16.4 "Log functions" on page 67 for more information about the switching on and off of the SD card.

21.3. Process data

Process data can be recorded via various media (SD card or serial port (bv.RS485)). All process changes are routinely recorded.
The data is recorded in fixed text format.

The structure is as follows:

> *<Day -Month-Year> <Hour: Minute> <Unit:> <Process> <Status of relay outputs>*

Example:

```
17-02-2010 13:06 Filter 1: Standby
17-02-2010 13:06 Filter 1: Service                : SV1
17-02-2010 23:07 Filter 1: Regeneration 1         : AP1
17-02-2010 23:17 Filter 1: Regeneration 2         : AP2
```

Any power failure is also recorded with the date and time when the controller failed and with the date and time when the controller switched on again.

Example:

```
=====================================================
Power failure: 17-02-2010 12:00 - 17-02-2010 13:20
=====================================================
```

Example of a file name:
PL100204.TXT : This file contains process log data from 04-02-2010.

22. Modbus

Attention ! This chapter only applies to control unit type RGS8x1x-xxxx.

The controller has a Modbus compatible protocol available.
This can be realized through RS485 communication (see § 18 "RS485" at page 72) or through ethernet communication (see § 15 "Ethernet" at page 61). In this part you can read about which registers are available and how they can be read and analyzed.

22.1. Registers

22.1.1. Register : values

40001	Modbus version				
40002-03	Flow Feed 1	See reg. 40085		2	M
40004-05	Flow 2	Prog.		2	M
40006-07	Flow 3	Prog.		2	M
40008-09	Pressure Feed 1	Prog.		2	M
40010-11	Pressure 2	Prog.		2	M
40012-13	Pressure 3	Prog.		2	M
40014-17	Water meter	L	0,1	4	M
40018-21	Water meter 1	L	0,1	4	M
40022-25	Water meter 2	L	0,1	4	M
40026-29	Water meter 3	L	0,1	4	M
40030	Treated water tank	%		1	M
40031	Chemical / brine tank	%		1	M
40032	Central valve 1			1	R
40033	Central valve 2			1	R
40034	Central valve 3			1	R
40035	Service valve 1			1	R
40036	Service valve 2			1	R
40037	Service valve 3			1	R
40038	High pressure pump			1	R
40039	Alarm			1	R
40040	Alarm 2			1	R
40041	Flush			1	R
40042	Additional program 1			1	R
40043	Additional program 2			1	R
40044	Additional program 3			1	R
40045	Regeneration			1	R
40046-67	Valves 1 - 22			1	R
40068	Regeneration start			1	R
40069	Wait			1	R
40070	Alarm reset			1	A
40071	Recorder 1	%		1	A
40072	Recorder 2	%		1	A
40073	Recorder 3	%		1	A
40074	Recorder 4	%		1	A
40075	Recorder 5	%		1	A
40076	Recorder 6	%		1	A
40077-84	Reserved				

M	Measurement	I	Input
R	Relay function	A	Analogue output (current)

Measurement :
De measurement value will be stored.
When the unity and number of decimals are predefined then this will be shown in this table. When this is programmable then this can vary and the unity and number of decimals can be read in the corresponding registers (see § 22.1.2 "Register : unities / decimals" at page. 81).

Digital inputs :
De state of the digital input function will be read bit wise :

0x8000	Function not linked to hardware in the inventory
0x4000	Function activated
0x2000	Function activated, but within delay time
0x1000	Function activated, delay time passed
0	Function not active

Relay outputs :
De state of the relay output function will be read bit wise :
When a security switch is defined then the state of this switch will also be indicated bit wise. When a analog output is defined the value (in %) will be indicated in the LSB byte.

0x8000	Function not linked to hardware in the inventory
0x4000	Relay active position
0x1000	Function activated
0x0400	Security switch activated
0x0200	Security switch activated but within delay time
0x0100	Security switch activated, delay time passed
0x00aa	aa = The value of the analogue output will be shown in 1%. This is the percentage between the minimal and maximal current (0-20 or 4-20mA).

Central valve outputs :
De position of the central valve output function will be read bit wise :

0x8000	CV output not linked to hardware in the inventory
0x4000	Relay active position (CV)
0x1000	Function activated (CV)
0x0080	Home output not linked to hardware in the inventory
0x0040	Relay active position (Home)
0x0010	Function activated (Home)

Analogue outputs :
The value of the analogue output will be shown in 1%. This is the percentage between the minimal and maximal current (0-20 or 4-20mA).

22.1.2. Register : unities / decimals

		Byte1	Byte 0	
40085	Flow Feed 1	Decimals	Unity	1
40086	Flow 2	Decimals	Unity	1
40087	Flow 3	Decimals	Unity	1
40088	Pressure Feed 1	Decimals	Unity	1
40089	Pressure 2	Decimals	Unity	1
40090	Pressure 3	Decimals	Unity	1
40091-96	Reserved			

0x8000 Value of register not valid

Unity :

0	No unity	30	l/h	90	sec
1	%	31	m3/h	91	min
2	mA	32	gpm	92	hour
40	kPA	33	cfm	93	day
41	bar				
42	psi				

Decimals:
        Number of decimals

22.1.3. Register : others

40097	Filter 1 : Proces ID		1	
40098	Filter 1 : Sub process nr		1	
40099	Filter 1 : Remaining time of sub process		1	sec.
40100	Filter 1 : Remaining capacity		1	%.
40101	Reserved		1	
40102	Filter 2 : Proces ID		1	
40103	Filter 2 : Sub process nr		1	
40104	Filter 2 : Remaining time of sub process		1	sec.
40105	Filter 2 : Remaining capacity		1	%.
40106	Reserved		1	
40107	Filter 3 : Proces ID		1	
40108	Filter 3 : Sub process nr		1	
40109	Filter 3 : Remaining time of sub process		1	sec.
40110	Filter 3 : Remaining capacity		1	%.
40111	Reserved		1	
40112-13	Remaining capacity until next regeneration start		2	0,1 l
40114-15	Remaining interval time until next regeneration start		2	sec
40116-17	Remaining time for minimal regeneration distance		2	sec
40118-21	Cumulative water meter		4	L
40122-23	Remaining volume until maintenance message		2	m3
40150	Alarm reset			

Register 40097,40102,40107 : Process ID
The current process will be indicated by a number. In the table below you will find the corresponding process description.

1	Standby	7	Not in use
2	Service	8	Alarm state
4	Service stop		
5	Regeneratioin		

Register 40098, 40103, 40108 : Sub Process ID
The number of the sub process will be indicated.

For the regeneration process the folowing numbers are defined :

1-9	Regeneration steps		
10	Pre regeneration 1	251	Wait during regeneration
11	Pre regeneration 2	252	Capacity exceeded
12	Post regeneration		
13	Home		

Register 40099, 40104, 40109: Remaining time of sub process
The remaining time for the current sub process will be indicated (in seconds).

Register 40100, 40105, 40110: Remaining capacity of filter
The remaining capacity for the filter be indicated (in %).

Register 40150 : Alarm Reset
This register can be written with a random value. When an alarm relay was activated so this will be deactivated.

23. Internet

Attention ! This chapter only applies to control unit type SFS8x1x-xxxx.

The controller is provided with a web server and is to be used with Internet Explorer.
There is a "head page", and a page with a display of the system by which the scheme is "fixed"
plus a page where the controller itself is displayed.
The texts on the web pages are in English.

23.1. Access via the local network (LAN)

The controller can be connected to the LAN (locale network).
If the network uses a DHCP-server the controller is automatically assigned a correct IP address (when
the controller starts up). Otherwise the controller will retain the IP address as specified in the Ethernet
configuration data (see § 15.1.2 "IP address" on page 61).

If the PC seeks the controller web pages in the local network, both the controller's IP address and the
controller's "local host name" can be entered in the browser's URL bar. The controller's "local host
name" consists of the type of controller and the controller's serial number.

Example:

> *A type SFS8000 controller with the serial number 000002 has a*
> *local host name: "SFS8000_000002"*

URL bar:

23.2. Access via internet (WAN)

It is possible to gain access to the control via the "world wide web" (internet).
The IP address (WAN) of the modem to which the control is connected to, with eventually the port
number, must be entered in the URL bar of the internet browser. See § 15.2 "Access via internet
(WAN)" on page 62 for more information about setting up the modem and the IP number of the
modem.

23.3. Security

The internet pages are secured with a user name and a password. If the controller is accessed via the
HTTP connection (internet) the following window will appear
If the correct information is entered, access will be allowed to the internet pages.
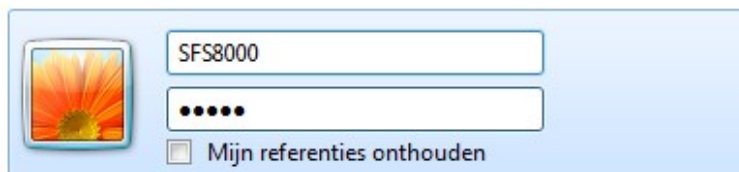
The standard settings for the user name and password are:

> User name   : <type of controller >   = "SFS8000"
> Password   : <empty>   = ""

23.4. Head page

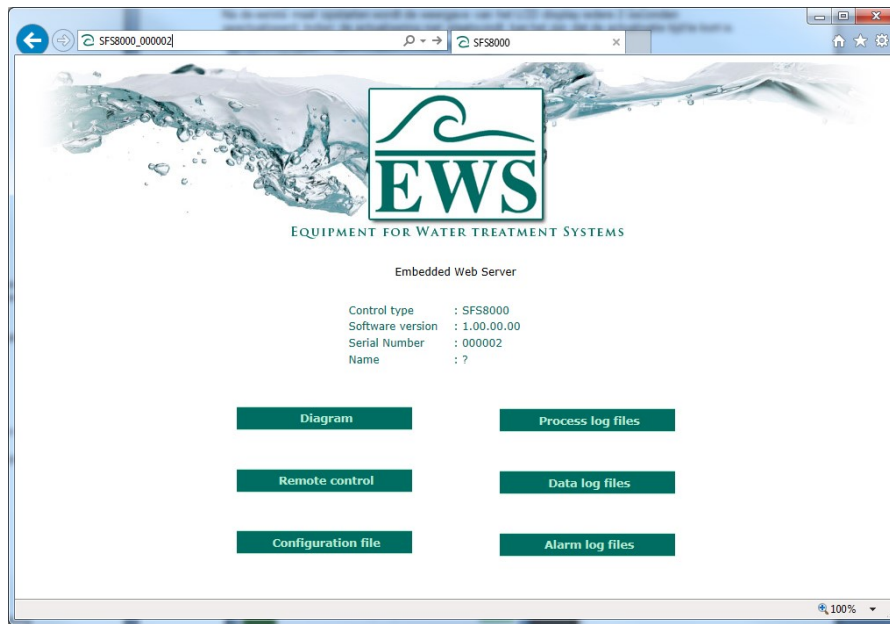After the IP address (or "local host name") is entered and confirmed in the URL bar and the correct user name and password are entered the above page will appear in the browser.
This is the head page.

This page features information about the controller with which the connection is made.

"Control type"   : The type of controller.
"Software version"   : The version of the software in the controller.
"Serial number"   : The controller's serial number
"Name"   : The controller's name
                          If no name is specified in the controller, a question mark will appear here.
See § 24.3 "Names" on page 88 for entering a name.

 The type of controller and the controller's name will also appear in the browser's "tab".
If no name is specified in the controller nothing will be displayed.

Example: without a specified name
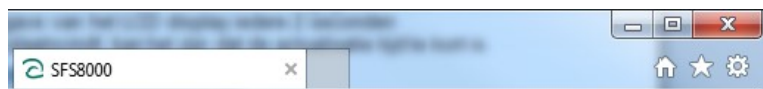
Example: with a specified name (name = oem)
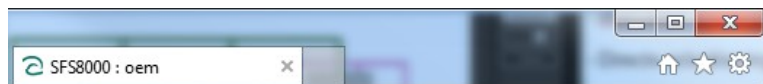
Various "links" are also made to other web pages. These web pages relate to the display of the unit, the display and operation of the controller and web pages with a list of the corresponding log files (alarm, data and process).
There is also a link ("Configuration file") to a file where the controller's programming
is stored in an easy-reference list.

Attention!
The options "Diagram" and "Remote control" are not available any more in software versions 1.05.03 and older.

23.5. Unit display

Attention!
This option is not available any more in software versions 1.05.03 and older.

The current status of the unit is schematically presented on this page.
The data is refreshed every 2 seconds.

- LED communication indication
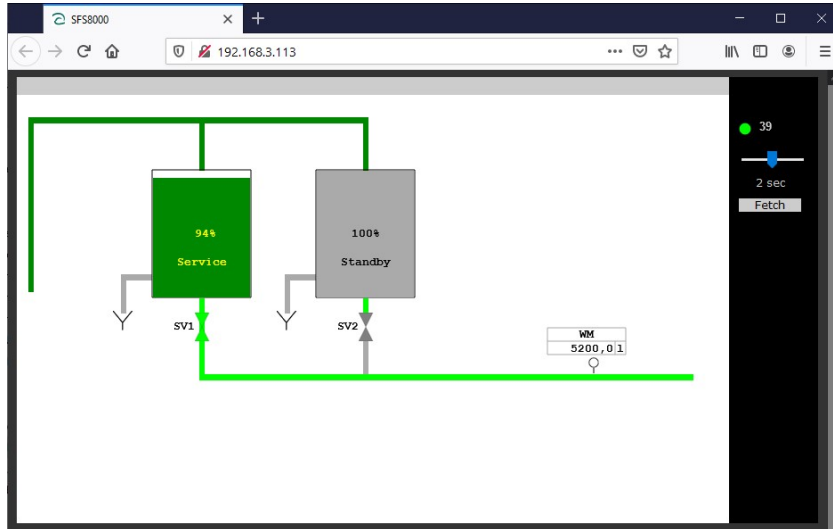- Interval time updating front

- Immediate updating front

The above example shows only the components defined in the controller. The controller is in service and all the inputs are in order.

23.6. Controller display / operation

Attention!
This option is not available any more in software versions 1.05.03 and older.

This page shows the current information on the LCD display. The "terminal" mode can also be used to change the settings in the controller.
After the initial start-up the LCD display is updated every 2 seconds.
When there is no updating of the front drawing it could be possible that the updating time is to short.
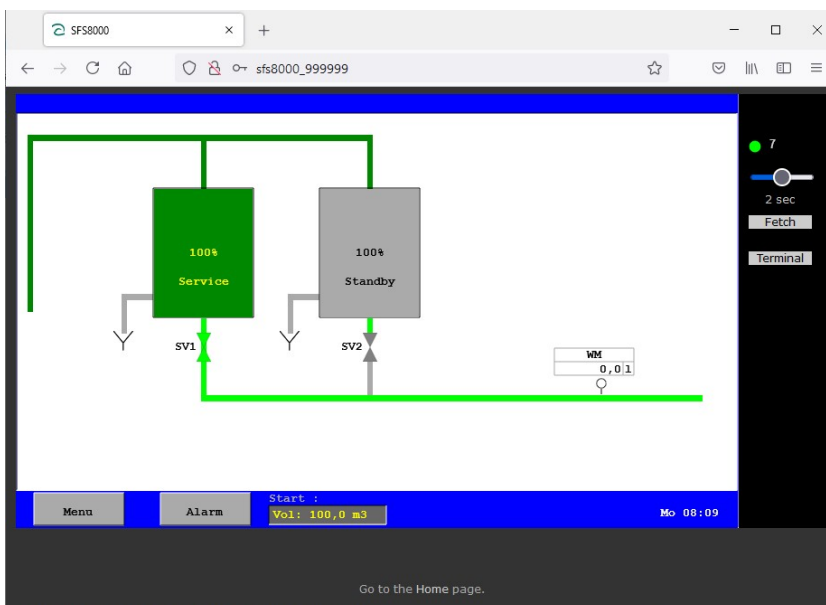
- LED communication indication
- Interval time updating front
- Immediate updating front
- Terminal mode

The touch panel allows you to deal with the control on a remote basis. The display will be renewed as soon as the touch panel is used again. If the touch panel is not used, the values will be updated according to the set interval.

23.6.1. Protection

Attention !
The security measures in this controller are normally sufficient for use
in a LAN network. Wenn the controller is being used for connection through the World Wide Web then further actions for security are advised (e.g. VPN).

The internet cnnection can be secured in several ways. There is a possibility to have a Total Block on the communication through internet. But it is also possible to select IP addresses that will have access to the controller. Furthermore you have the possibility to select if changes to the controller are allowed through internet.
These settings are explained in § 25.2 "Internet" at page 93.

23.6.2. Terminal mode

In the terminal mode the controller can be changed remotely. In the security settings you will have to activate this mode. If this mode is activated you can set a password for this mode.
In the web browser you have to press the "Terminal" button and a dialog box will appear where you have to input the pass word. Then press "Send" to activate the terminal mode/

See also § 25.2 "Internet" at page 93..

23.7. Getting log files

The internet can be used to view log files stored on the SD card.

In the main menu, pressing on the link with the required list of log files will call up a page with the available files. When no SD card is available no files will be displayed but a warning will be given that the SD card is not available.

Example:
The "Data log" link is pressed.

List of data log files. CSV and XML files are available on the SD
card.
Data in the CSV file logged on 02-03-2018.

]
Pressing on file name (link) will open the browser. If the file has to be downloaded the browser options have to be used.

Attention!
An XML file for the current day may be obtained only if the process for logging the corresponding data to the SD card is deactivated or if the SD card is deactivated, because during the deactivation period the XML file is converted to a valid file.
The SD card can be deactivated by staff onsite or via the "terminal" mode in the browser.
See § 16.4 "Log functions" on page 67 for more information about switching the SD card on and off.

23.8. "Internet key"

This software is not applicable any more.

24. Service

The controller's service menu allows settings to be applied for maintenance and settings, which are for authorised people only.

The service settings option is located in the main menu.

§ 4.3 "Window" on page 10 describes how a setting can be changed.

The service menu can be secured against unauthorised persons. A key then appears after "Service" to show that the option is secured (see also § 25.1.2 "Menu" on page 93).

24.1. Service number

A service telephone number can be programmed in the controller. The user can ring this number in the event of any questions.

The user can view the service telephone number in the information menu (see § 11.2 "Service number" on page 53).

The service number has a maximum of 19 characters.

24.2. Maintenance

A maintenance warning can be activated here. This warning can be used to warn about a maintenance activity. An interval time of between 1 and 65,000 m3 may be set.

24.3. Names
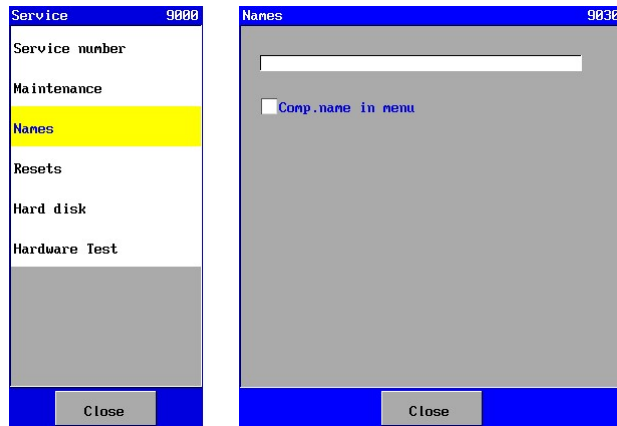
The "name" of the controller can be entered in this window. This name appears on the internet page (see § 23.4 "Head page" on page 84) to make a clear reference to a specific unit.

A name with a max. of 39 characters can be specified.

Also can be specified whether the default name will be used in the menu's (uncheck) or the name as specified in the inventory menu (check).

See also § 5.1 "Inventory" on page 13.

24.4. Resets
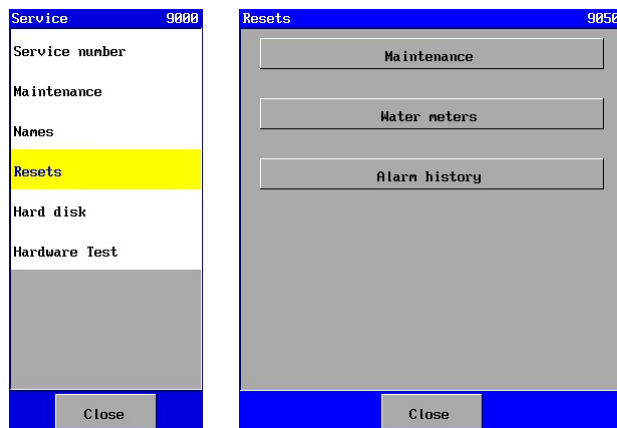
Specific records may be set in this window.
- "Maintenance" Maintenance volume counter set at zero.
- "Water meters" Water meters are set at zero.
- "Alarm"   Alarm history deleted.

The reset is completed by pushing the reset button.

24.5. Hard disk
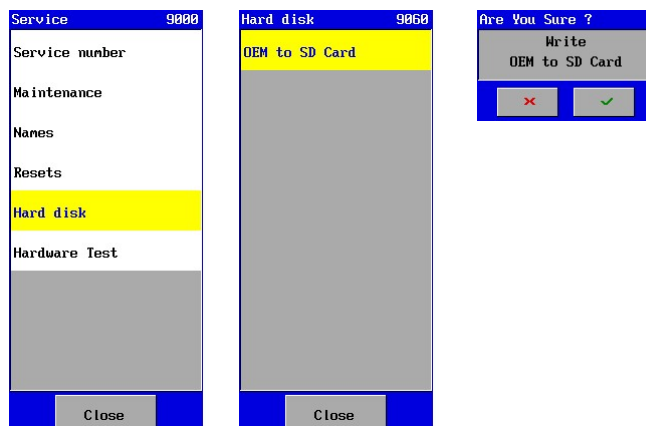
The controller's programming is stored on an internal "hard disk". This window can be used to copy the programming to an SD card with which, for example, a standard setting for a specific unit type can be stored.

24.6. Hardware test

This option allows you to test the hardware in the light of the unit display and control.
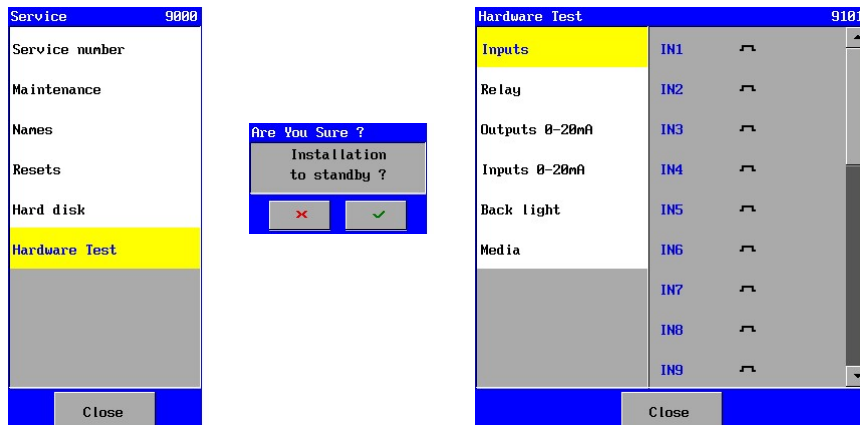
24.6.1. Inputs
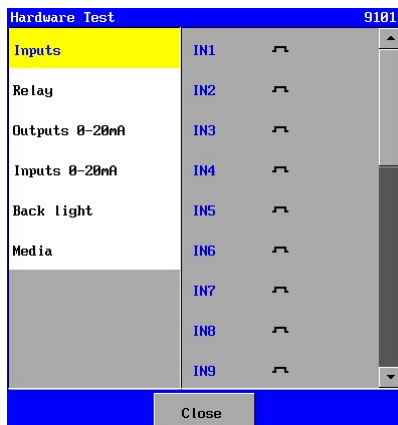
The digital inputs can be tested in this window.
  ⌐¬ Closed input contact.
  ⌐⌐ Opened input contact.

24.6.2. Relay outputs
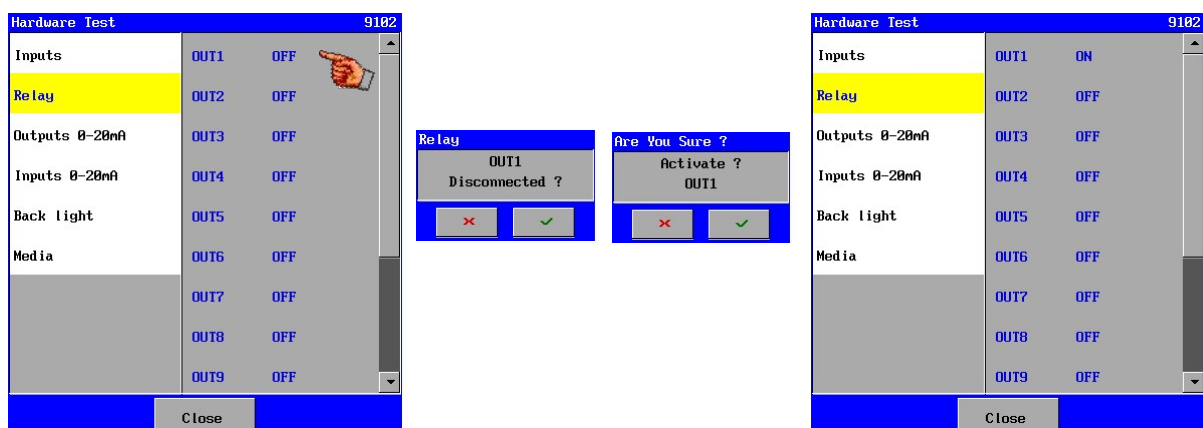
The relay outputs can be tested. A relay can be activated or deactivated by pushing the text on the touch panel, whereupon the following windows will be called up for choice confirmation and alert.

Attention!
To prevent a pump, for example, being switched on while a valve is still closed, you are advised to remove the output connections.

24.6.1. Outputs 0-20mA

Hardware Test		9113
Inputs	OUT1	0 mA
Relay	OUT2	0 mA
Outputs 0-20mA	OUT3	0 mA
Inputs 0-20mA	OUT4	0 mA
Back light	OUT5	0 mA
Media	OUT6	0 mA
	Close	
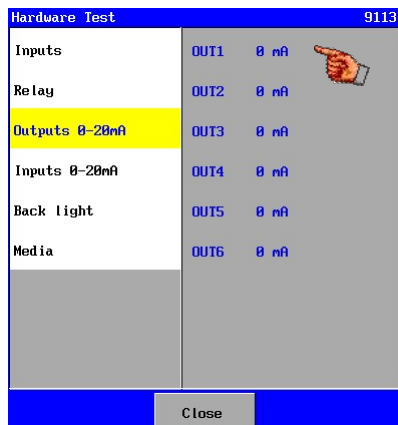
The recorder output management can be controlled. In first instance, all outputs will be set at 0mA. It is possible to increase the current of a certain output by 4mA at a time. If the text is pressed at a current of 20mA, then the current will be switched off again (0mA).

This option is only displayed if the optional circuit board with recorder outputs (ca-3rec) is present.

24.6.2. Inputs 0-20mA

Hardware Test		9112
Inputs	IN-mA1	0
Relay	IN-mA2	0
Outputs 0-20mA	IN-mA3	0
Inputs 0-20mA	IN-mA4	0
Back light	IN-mA5	0
Media	IN-mA6	0
	IN-mA7	0
	IN-mA8	0
	IN-mA9	0
	Close	
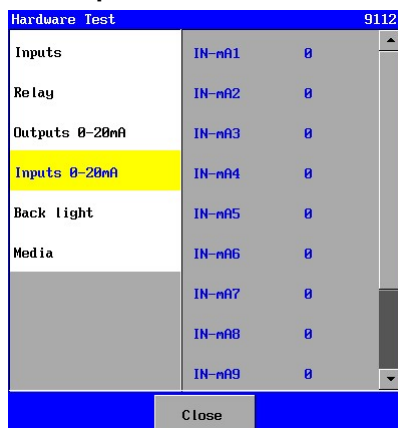
This window allows checking whether the 0-20mA inputs function appropriately.

A value of ca. 4000 should be displayed when power values reach 20mA. The current supply and the shown value have a linear course.

24.6.3. Back light

Hardware Test		9130
Inputs	100 %	
Relay		
Outputs 0-20mA		
Inputs 0-20mA		
Back light		
Media		
	Close	
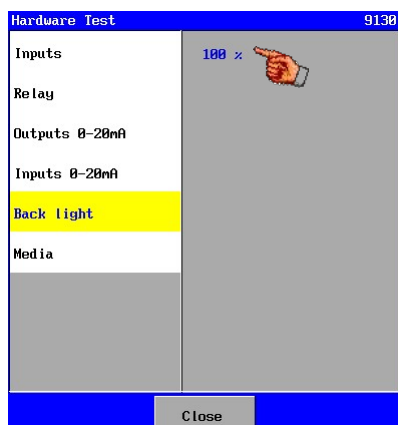
The light supply can be controlled.

It is possible to check whether the back light supply works appropriately by pushing the text box ("100%").

The supply will always switch between 50% and 100%. The lighting should be dimmed notably at 50%,.

24.6.4. Media

Attention ! This chapter only applies to control unit type SFS8x1x.

Hardware Test	9150
Inputs	RS485 Rx: 0 Tx: 0
Relay	RS232 Rx: 0 Tx: 0
Outputs 0-20mA	
Inputs 0-20mA	
Back light	
Media	
	Close
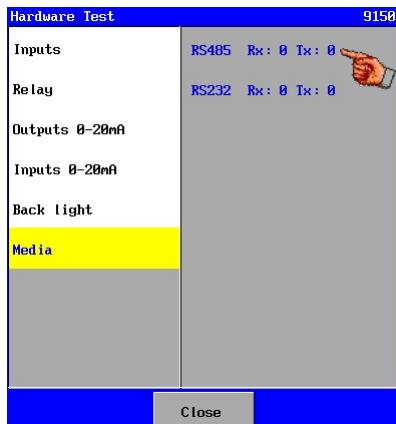
In this screen the RS232 port and the 485 port can be controlled.
The send and receive lines can be controlled independently.

The counter behind "Rx" (receive line) is increased by 1 each time a "COMTEST" message is sent by the control. This message can be sent, for example, via the PC "HyperTerminal" software (settings : baudrate=9600,databits=8,stopbits=1, parity=no).
In "HyperTerminal" the text "COMTEST" then needs to be entered, after which the "Enter" key needs to pressed.

A message containing the type of control and the serial number will be sent by pushing the text box "Tx" of the targeted communication port. For example "SFS8000 750345" for a SFS8000 with serial number 750345. If the message has been sent, the counter behind "Tx" will be increased by 1.

25. Security
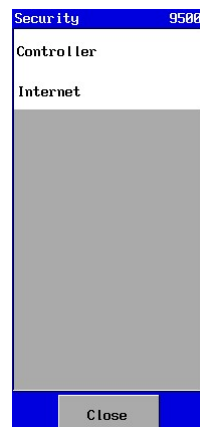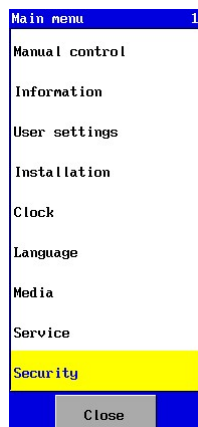
The security menu in the controller is for making settings for securing certain settings and processes and securing internet access. The settings security option is located in the main menu.

25.1. Controller

Specific settings in the menu and processes can be secured against use by unauthorised persons. A password has to be entered towards this end.
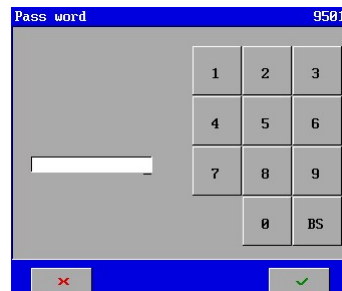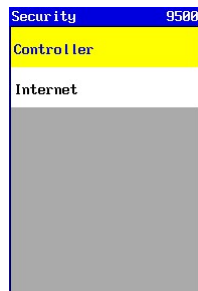
When the password is set the right password has to be entered to access this menu.
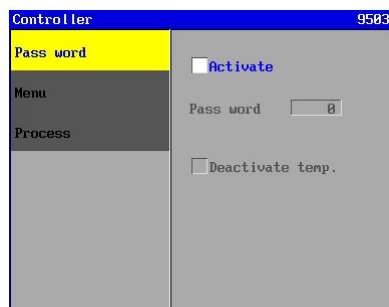
If the password is not set the menu and processes security features are not activated and nor are they shown in the menu.

25.1.1. Pass word
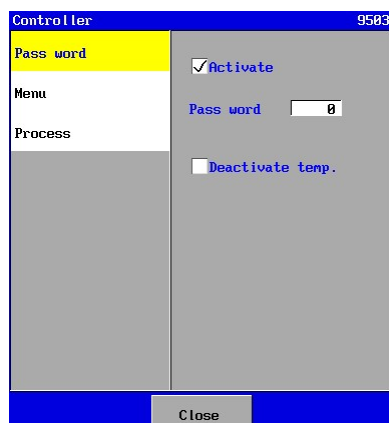
The password can be activated in this window. The password can be entered if this is activated. The password has to be a number between 0 and 9999.

The security feature may also be temporarily switched off as a result of which an authorised person can access all the settings if they remain in the menu. As soon as you quit the menu to return to the main screen the security will be automatically reactivated, thus guarding against cases where people forget to switch the security feature on again.

25.1.2. Menu

Various submenus can be secured in the menu simply by "checking the box".

Activating a security feature for a specific component calls up a key to show the component is secured.

25.1.3. Process

When the maintenance process is secured in the menu, no-one will be able to launch the maintenance. This security feature can be activated by "checking the box".

The security feature first has to be turned off before the maintenance process can get underway.

25.2. Internet

Attention ! This chapter only applies to control unit type RGS8x1x-xxxx.
Attention !
The security measures in this controller are normally sufficient for use in a LAN network. When the controller is being used for connection through the World Wide Web then further actions for security are advised (e.g. VPN).

The controller has a web server which can be connected over the internet. Various securities features are set with this option.

You can set if a connection with the controller is allowed. If this is not allowed there will be communication possible with the controller through internet

You will be asked for your user name and password before a connection is made to the web server (see also § 23.3 "Security" on page 83).
The password can be changed and can be a maximum of 16 characters long.

You can set a security check on IP addresses (2 pieces). In this case only the IP addresses as set will have access to the controller.

Internet	9550		Internet	9550
☑ Connection allowed			☑ Connection allowed	
Pass word	aa		Pass word	aa
☑ IP security			☑ IP security	
IP1 0 0 0 0			IP1 0 0 0 0	
IP2 0 0 0 0			IP2 0 0 0 0	
☐ Changes allowed			☑ Changes allowed	
Pass word			Pass word	
Close			Close	

Settings can be changed via the internet.
When the "Changes allowed" option is switched off, the end user can disable any scope for changes via the internet.

26. Power failure

26.1. Clock

The data is stored in the event the controller's power supply fails.

The controller has a battery so the time and date can be kept. If the controller is switched on again the time and date have to be reset.
The control unit also checks whether the date is correct (year> 2009). If this is not the case, then a message will be displayed in the alarm window that the clock must be set.

In the case of summer time and winter time, the time and date have to be adjusted manually.

26.2. Alarms

Thanks to the various alarm options, a power failure is always notified when the controller is switched on again.
Exceptions to this are the alarms via an alarm relay. With the alarm relay you can choose to have the alarm relay activated or otherwise after a power failure.
See § 6.4 "Alarm" on page 22.

26.3. Programming

The controller programming is stored in a file.
The file is read off when the controller starts.

If the programming is changed the altered data will be stored when you quit the main menu but if the controller cut outs when this is in the main menu any altered data there may be will not be stored and the "old" data will be read off again after the control starts.

27. Messages

27.1. Hardware changed

If a change has been made to the hardware configuration of the control (by changing the circuit board), the above notification will appear. In this case the inventory of the components needs to be checked because it is possible that a function is no longer linked to the hardware because of removal of said hardware.

28. Boot software

28.1. General

The controller features two software programs: the boot software and the application software (for example SFS8000). If the controller is launched the boot software will first of all be opened. Explanations will be given in this chapter of the boot software and how the application software can be changed.

28.2. Changing application software

The controller will always start in the boot software whereupon the following window will appear. This shows the version of the boot software and whether a valid application is available and if so what application software is available.
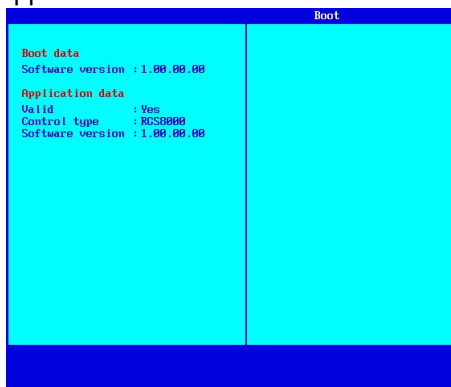
Next a check is made to see if a SD card is available in the connector intended for this purpose. If not the application software will be automatically started, provided a valid application is available.

When no valid application is available a warning appears in the display so an SD card has to be inserted with the specified software.

If the SD card is detected, an overview is provided of the software versions available on the SD card.
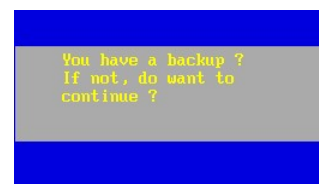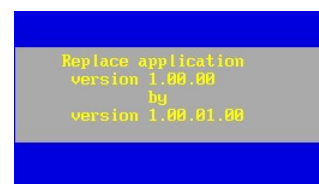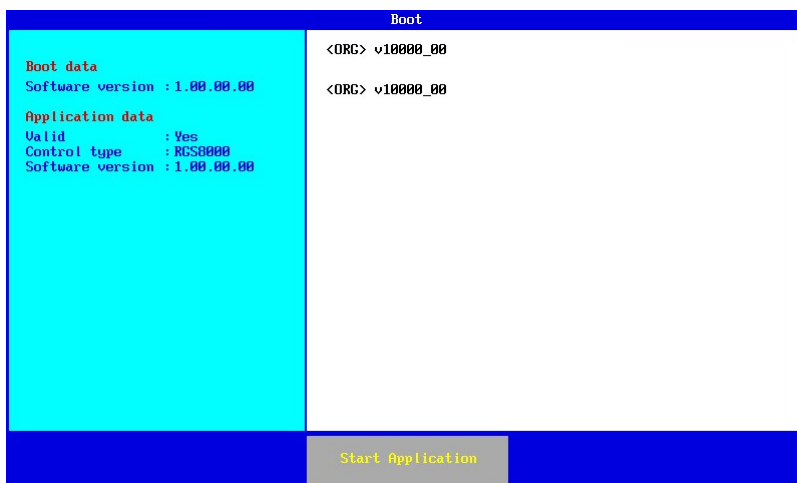
It is possible to load certain software by pushing the text of the targeted software version.
If a valid application is already available in the controller, confirmation will be requested to make an update and you will then be asked whether a back-up has been made of the current software and setting.

Any valid application available will be launched.

During the update a check is made first of all to see if the file on the SD card is valid.
The new application is next placed in the controller whereupon the internal
hard disk is formatted and any other files are placed on this hard disk.

29. Frequently asked questions

29.1. General

Question:
LCD display does not show anything.

> ***Answer:***
> - Is the right power supply voltage connected?
> - Is there a cable cut affecting the power supply?
> - Is the power supply voltage connected to the right pins (1 + 2)?
> - Are the fuses OK?
> - Are the tape cables correctly connected?
> - Is the contrast effectively set (P4)?

29.2. Relay outputs

Question:
Relay output does not turn on.

> ***Answer:***
> - Check in the main screen to see if the output is activated.
> If it is, check if the secondary fuse (F3) is OK.
> If not, check the settings for the corresponding phase.

29.3. Digital inputs

Question:
Inputs not detected.

> ***Answer:***
> - Is the input activated for the corresponding phase?
> If it is, check if the secondary fuse (F3) is OK.
> If not, change the setting for the corresponding phase.

29.4. E-mail

Question:
No e-mails sent.

> ***Possible causes:***
> - Only control unit type SFS8x1x-xxxx is suitable for sending emails.
> - Is the e-mail address provided correct? See § 17.1.4 "E-mail address of the recipient " on page 71.
> - Is the IP address of the SMTP server correctly set? See § 17.1.2 "IP address of SMTP server" on page 70.
> - Is the Default Gateway correctly set? See § 15.1.4 "Default gate-way" on page 62.
> - RJ45 cable correctly connected (green LED for RJ 45 connector off?)
> Does the RJ45 connector's orange LED flicker when an attempt is made to send an e-mail?

29.5. Internet

Question:
Web server page does not appear in the browser.

> *Possible causes:*
> - Only control unit type SFS8x1x-xxxx is accessible via internet.
> - Is the correct IP address of the "local host name" entered? See § 15.1.2 "IP address" on page 61.
> - In the event of a DHCP server: was the controller connected to network at start-up?
> - RJ45 label correctly connected (green LED or RJ45 connector on?)
> - Does the RJ45 connector's orange LED flicker when an attempt is made to send an
> - e-mail?
> - Is the port number correctly set? See § 15.1.5 "HTTP port number " on page 62.
> - Is the Default Gateway correctly set (if contact is sought via the "World Wide Web")? See § 15.1.4 "Default gate-way" on page 62.
> - Web browser possibly not compatible. Try Internet Explorer 8.

29.6. RS485

Question:
No information lines appear on the "Hyperterminal" screen.

> *Possible causes:*
> - Only control unit type SFS8x1x-xxxx is equipped with a RS485 port.
> - Is the right COM port connected and set on the PC?
> - Is a RS232/RS485 converter available?
> - Is the connection on the controller correct (wires changed)?
> - Are the baud rate, data bits, stop bits and parity appropriately set on the PC?

29.7. RS232

Question:
No information lines appear on the "Hyperterminal" screen.
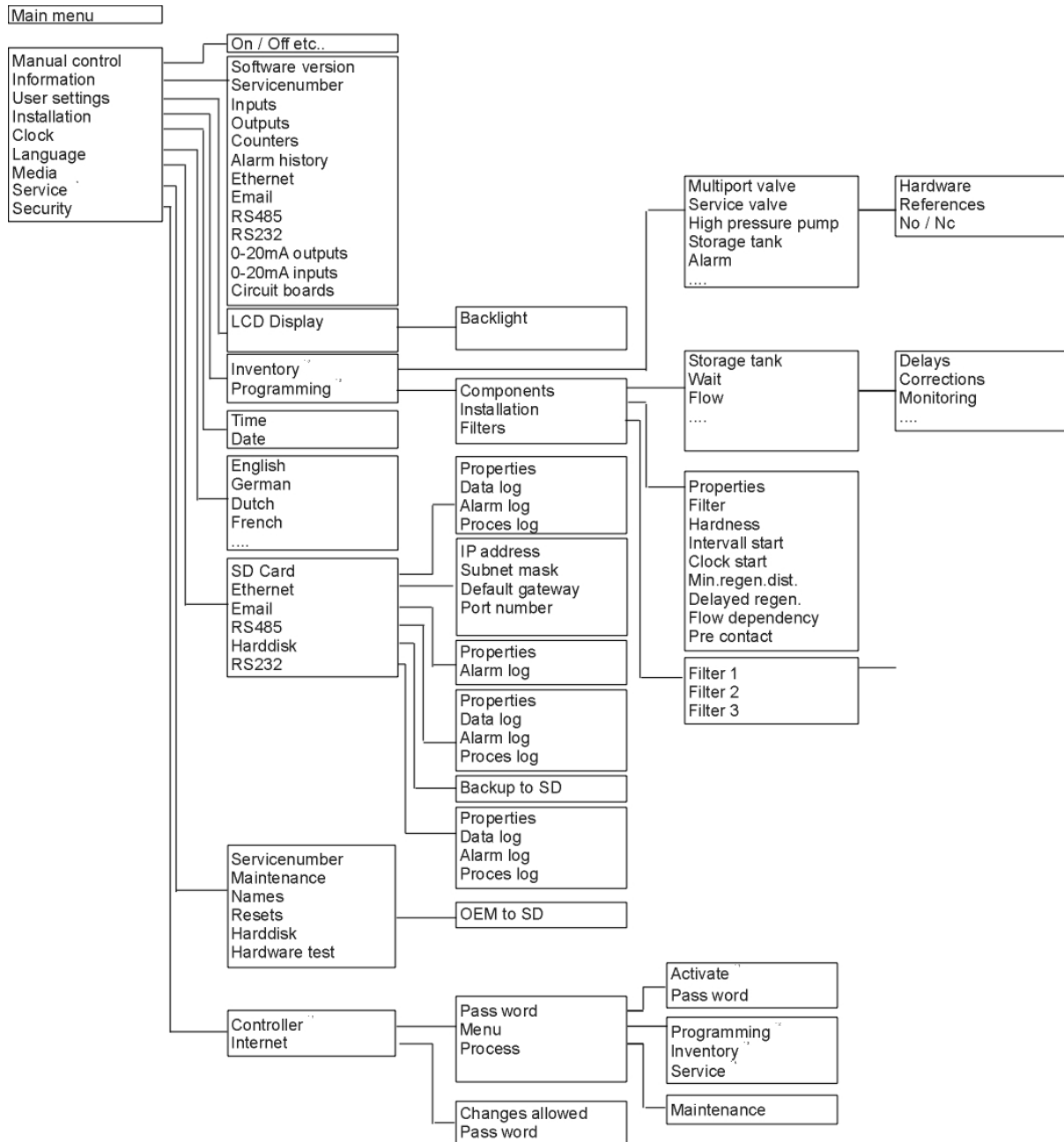
> *Possible causes:*
> - Only control unit type SFS8x1x-xxxx is equipped with a RS232 port.
> - Is the right COM port connected and set on the PC?
> - Is the connection on the controller correct (wires changed)?
> - Are the baud rate, data bits, stop bits and parity appropriately set on the PC?

30. Terminology

This chapter provides a brief explanation about the specific terms and abbreviations used in the operating manual.

Term / abbreviation	Description
SD card	"Secure Digital" card. This is a file storage medium.
XML format	"eXtensible Markup Language". This is a general file structure for use in various types of software (such as directly opening in Excel, Access).
CSV format	"Comma Seperated Value". This is a file structure often used to record measurement data. This format can be imported into spread sheets (such as Excel)
RS232	Serial communication port which can be connected to the PC's serial COM port.
RS485	Serial communication port which (via converter) can be connected to the PC's serial COM port by means of an RS232 / RS485 converter, which is not included in the delivery.
SMTP server	Server for an e-mail message
CV	Multiport valve
SV	Service valve
VA	Single valve
HP	High pressure pump
AL	Alarm signal
AP	Additional program
FP	Flush
HL	High level switch
LL	Low level switch
BT	Brine tank
WM	Water meter
WA	Wait
RS	Alarm reset
SR	Start Regeneration
RC	Recorder output (0-20 mA)
FL	Flow meter
PR	Pressure meter

31. Overview menu

Main menu

Manual control
Information
User settings
Installation
Clock
Language
Media
Service
Security

On / Off etc..

Software version
Servicenumber
Inputs
Outputs
Counters
Alarm history
Ethernet
Email
RS485
RS232
0-20mA outputs
0-20mA inputs
Circuit boards

Multiport valve
Service valve
High pressure pump
Storage tank
Alarm
....

Hardware
References
No / Nc

LCD Display

Backlight

Inventory
Programming

Components
Installation
Filters

Storage tank
Wait
Flow
....

Delays
Corrections
Monitoring
....

Time
Date

English
German
Dutch
French
....

Properties
Data log
Alarm log
Proces log

Properties
Filter
Hardness
Intervall start
Clock start
Min.regen.dist.
Delayed regen.
Flow dependency
Pre contact

SD Card
Ethernet
Email
RS485
Harddisk
RS232

IP address
Subnet mask
Default gateway
Port number

Properties
Alarm log

Filter 1
Filter 2
Filter 3

Properties
Data log
Alarm log
Proces log

Backup to SD

Properties
Data log
Alarm log
Proces log

Servicenumber
Maintenance
Names
Resets
Harddisk
Hardware test

OEM to SD

Activate
Pass word

Controller
Internet

Pass word
Menu
Process
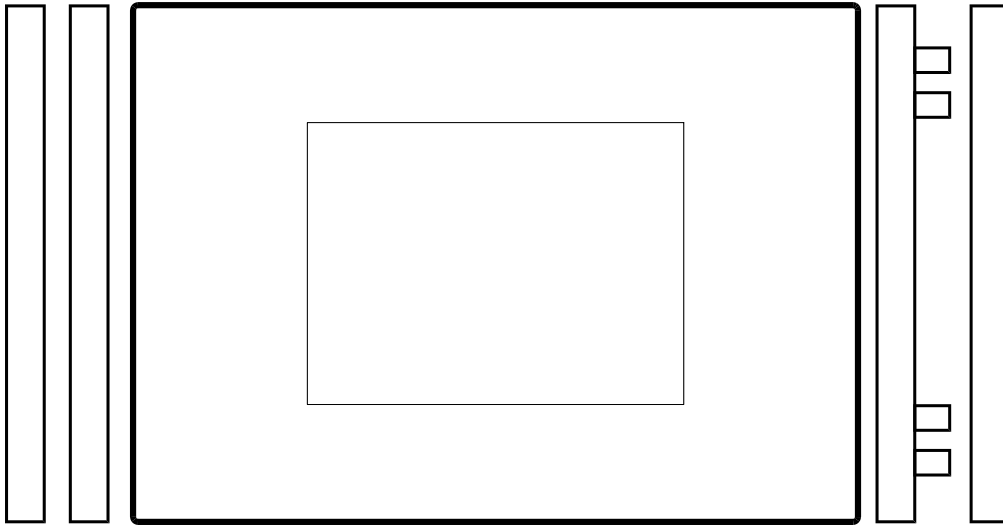
Programming
Inventory
Service

Changes allowed
Pass word

Maintenance

32. Opening casing

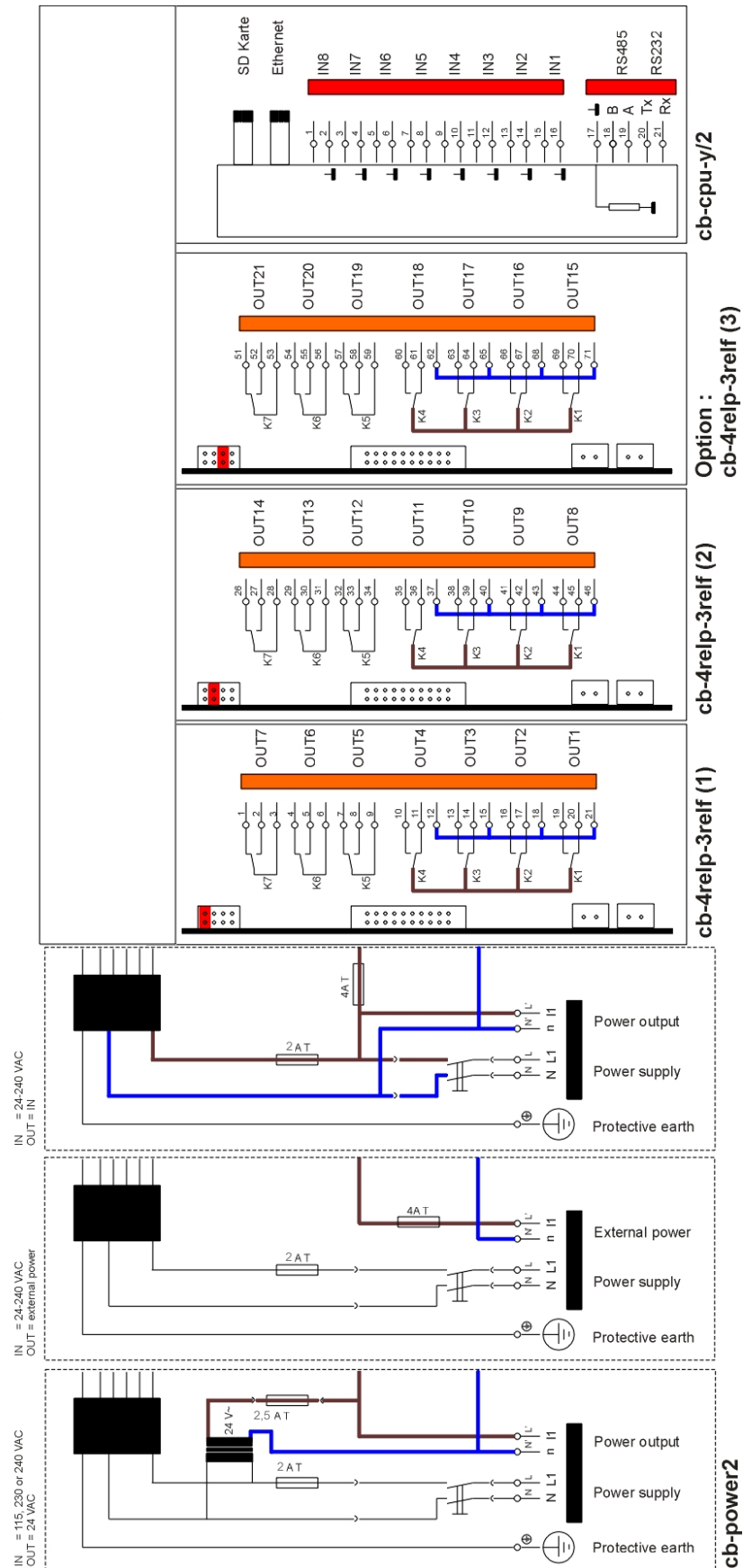Remove the four side covers of the housing.

Open the housing on the left side by carefully placing the key cover between the hinge points and pushing until the front door springs open.
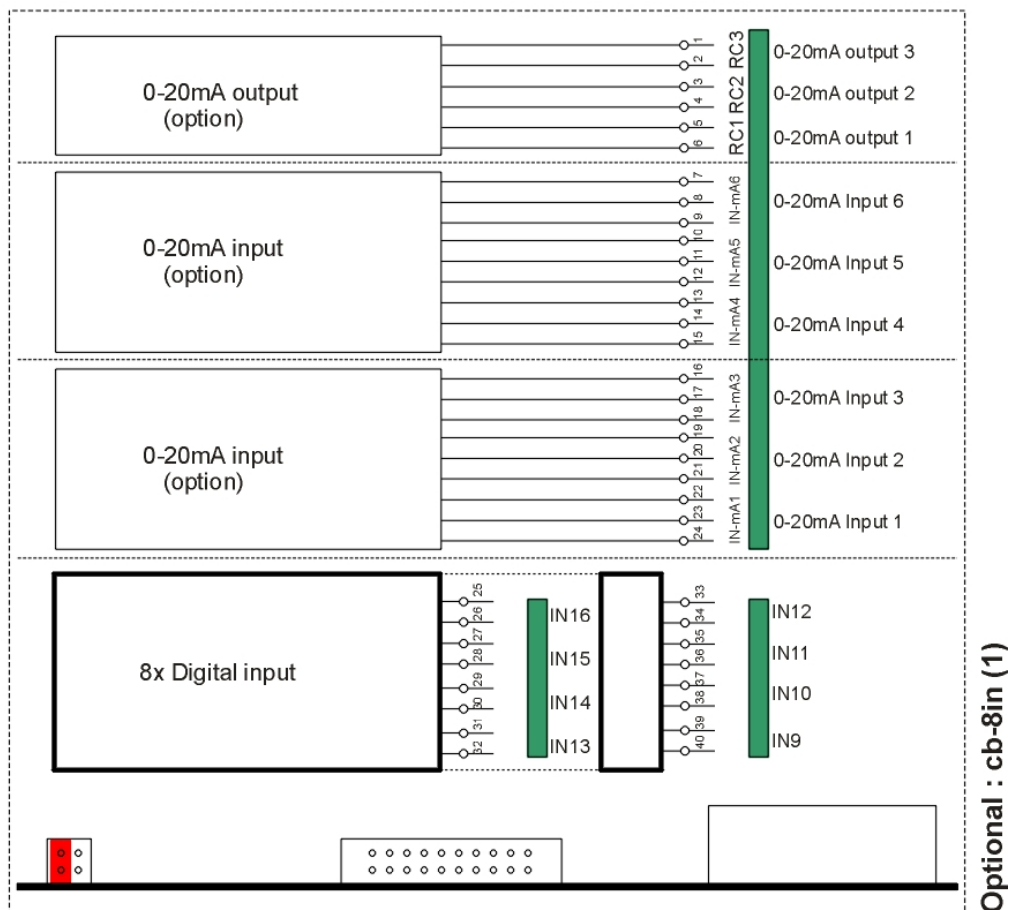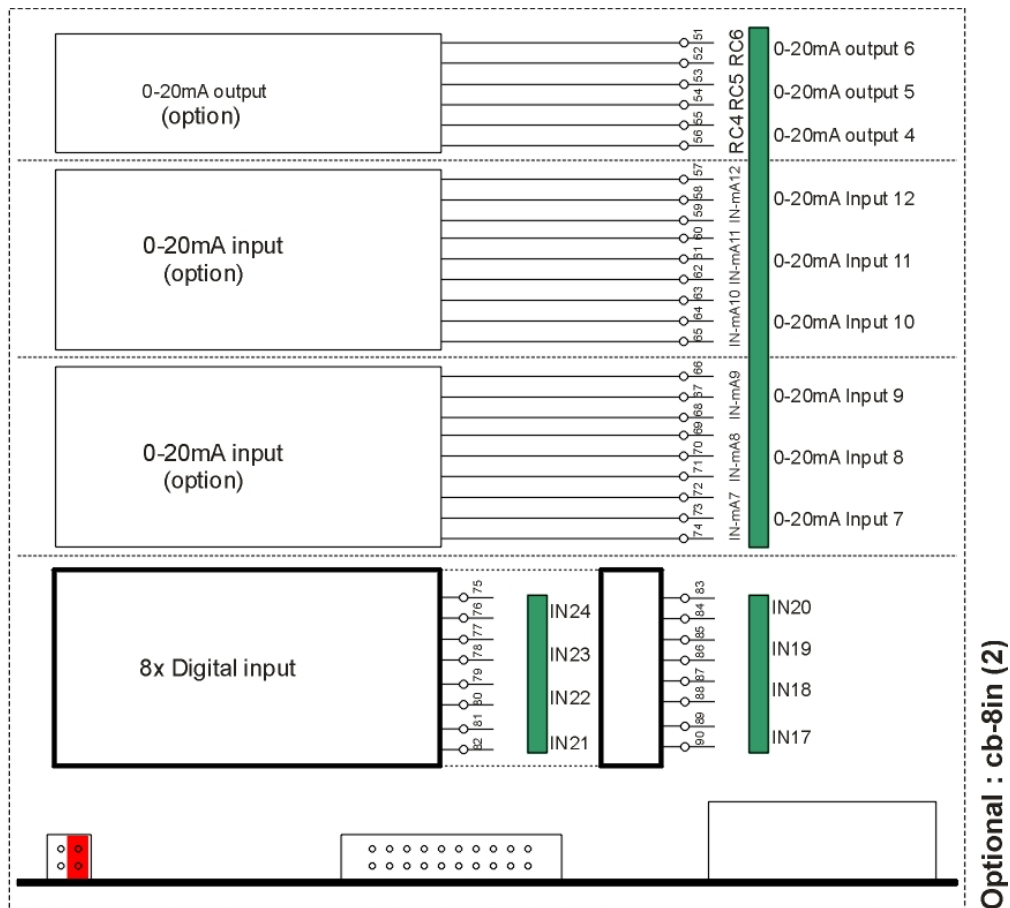
33. Terminal block connection
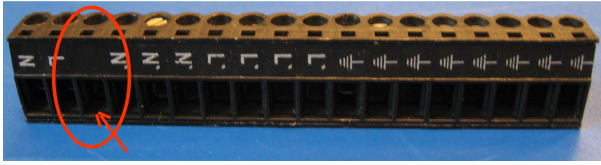
33.1. Schematics

Connection terminals
SFS8000 (Measure circuit boards)

0-20mA output
(option)

51 52 51	RC6 0-20mA output 6
54 53	RC5 0-20mA output 5
56 55	RC4 0-20mA output 4

0-20mA input
(option)

57	IN-mA12 0-20mA Input 12
59 58	IN-mA11
60	IN-mA10 0-20mA Input 11
62 61	
63	0-20mA Input 10
65 64	IN-mA10

0-20mA input
(option)

66	IN-mA9 0-20mA Input 9
68 67	IN-mA8
69	0-20mA Input 8
71 70	IN-mA8
72	IN-mA7 0-20mA Input 7
74 73	

8x Digital input

75 76 75	IN24	83	IN20
77	IN23	84	
78		85	IN19
79	IN22	86	
80		87	IN18
81	IN21	88 89	
82		90	IN17

Optional : cb-8in (2)

0-20mA output
(option)

1	RC3 0-20mA output 3
2	RC2
3	0-20mA output 2
4	RC1
5	0-20mA output 1
6	

0-20mA input
(option)

7	IN-mA6 0-20mA Input 6
8	
9	IN-mA5
10	0-20mA Input 5
11	IN-mA4
12	
13	0-20mA Input 4
14	IN-mA4
15	

0-20mA input
(option)

16	IN-mA3 0-20mA Input 3
17	
18	IN-mA2
19	
20	0-20mA Input 2
21	IN-mA1
22	
23	0-20mA Input 1
24	IN-mA1

8x Digital input

25	IN16	33	IN12
26		34	
27	IN15	35	IN11
28		36	
29	IN14	37	IN10
30		38	
31	IN13	39	IN9
32		40	

Optional : cb-8in (1)

33.2. Remarks

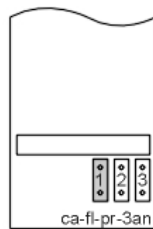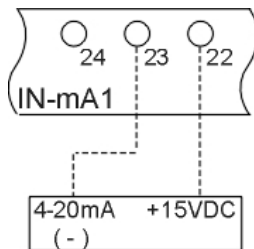
The 3th terminal of the 18 pole black connector will not be used (see picture above).

34. Electrical connection examples

Attention!
When connecting components, it is recommended to completely disconnect the power supply from the controller.

Connection of flow meter (2 wires)

Connection of a 2-wire flow meter with a 4 – 20mA output to input IN-mA1.
A "jumper" should be placed on the "ca-fl-pr-3an" PCB as shown in the illustration.

Jumpers "2" and "3" should be installed for IN-mA2 and IN-mA3, respectively.

Connection of flow meter powered by external supply (2 wires)
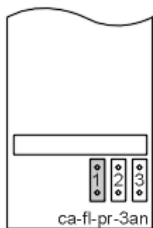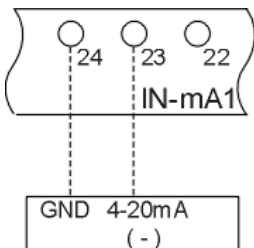
Connection of a 2-wire flow meter powered by external supply with a 4 – 20mA output to input IN-mA1.
A "jumper" should be placed on the "ca-fl-pr-3an" PCB as shown in the illustration.

Jumpers "2" and "3" should be installed for IN-mA2 and IN-mA3, respectively.

RS232 Connection
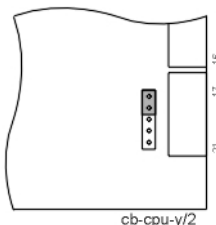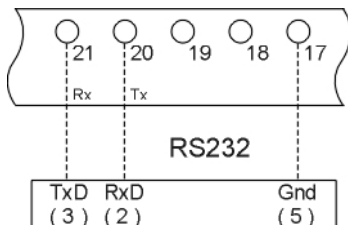
Connector type DB9

To set the communication port of the controller to "RS232", the jumpers should be installed (cpu PCB cb-cpu-y/2) according to the illustration shown on the left.

RS485 Connection
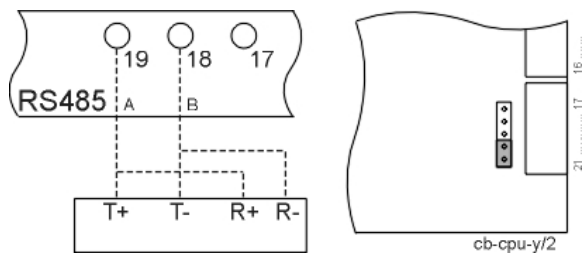
To set the communication port of the controller to "RS485" with termination resistor (120 Ohm), the jumper should be installed (cpu PCB cb-cpu-y/2) according to the illustration shown on the left.

No jumpers should be installed if no shut down threshold is wanted.

35. Installation and Start up

35.1. General

Installation and commissioning of the control system may only be carried out by trained specialists who are familiar with these operating instructions and the applicable regulations on safe working practices and accident prevention. The instructions given in this manual must always be observed and followed.
To guarantee functional operation and safety, the instructions in this manual must be followed. The manufacturer accepts no liability for damage resulting from failure to follow the instructions.

Assembly
- Do not install under damp pipes. Fit shielding if necessary.
- Insert the flush-fit unit into the 186x138 panel opening and secure using the corresponding clamps and sealing ring.
- Install device at eye level and easily accessible to the user.

Connection
- Before carrying out connection work, always ensure the control unit is first disconnected from the power supply. Make sure that the power supply remains disconnected during connection work.
- Make electrical connections. Observe local regulations.
  Connect supply voltage and ground to the terminals shown in the wiring diagram.
- Make sure that the ground connection is faultless.
- If possible, keep all extra low voltage cabling (digital inputs, measurements) separate from the power supply cable.
- It is not permitted to connect the potential-free relays with a combination of 230 VAC and extra low voltage.
- The flush-fit unit is supplied without main switch. Install this main switch in the switch cabinet yourself.
- Some external relays, magnetic switches, solenoid valves, etc. can cause unwanted interference pulses when switched off.
  For this reason, it is recommended that the components mentioned should be equipped with a so-called RC network in advance.
  Ask the supplier of the mentioned components for the correct type of RC network.

Maintenance
The control system does not contain any user-serviceable parts. Unauthorised modifications and/or repairs to the control unit will void all warranty claims and the manufacturer's liability.
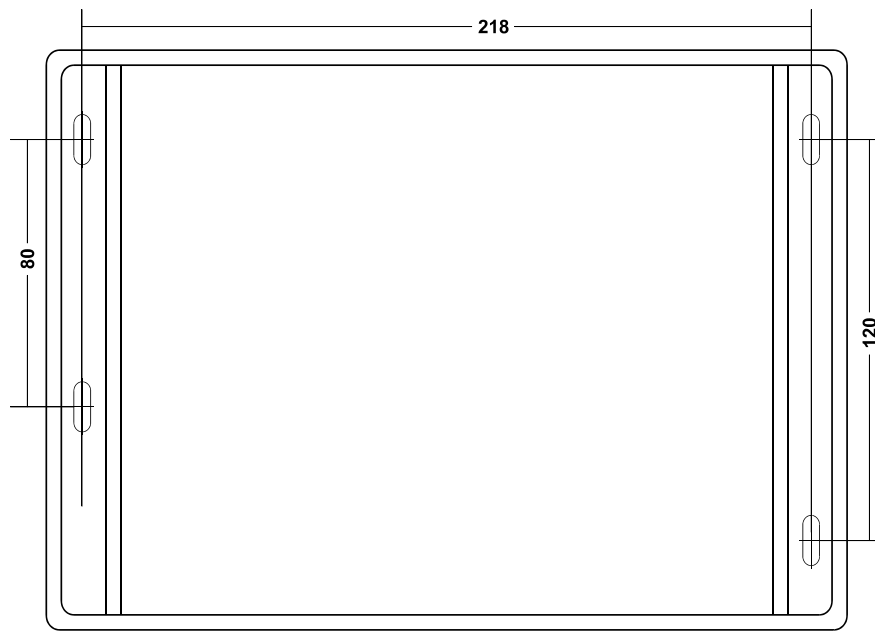
Commissioning
- Keep front lid closed at all times
- The control system may only be switched on if it is completely closed and all connections have been made correctly.

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

35.2. Installation

35.3. Ethernet connector

The controller can be connected to an Ethernet connection. Towards this end a RJ45 connector is placed in the controller. The RJ45 plug cannot be placed through the swivel so a ready-made cable cannot be used and one has to be assembled by the user.

36. Maintenance

The control system does not contain any user-serviceable parts. Unauthorised modifications and/or repairs to the control unit will void all warranty claims and the manufacturer's liability.

LCD display
If the "touch panel" is operated with dirty fingers, it may happen that the LCD becomes difficult to read. Should this occur the LCD display can be cleaned with a moist cloth.

Caution: Do not use chemical cleaning products for this, only water!

37. Spare parts

37.1. Order codes

Item code	Description	
EH-A	Panel assembly set	(4x screw, 4x insert)
EH-C-N	Side cover	
EH-C-K	Key cover	
EH-U-S	Transparent door	

37.2. Pictures

EH-A

EH-C-N

EH-C-K

EH-U-S

38. Technical specifications

Power supply	Features: Tolerance:	24VAC, 115 VAC, 230VAC, 240 VAC, 115/24 VAC, 230/24 VAC, 240/24 VAC 10%
Power input		12 VA
Relay outputs	Powered: Potential free:	Total 4A (all powered outputs together) Total 2,5A (115/25V, 230/24V and 240/24V) 250 V, 4A per relay
Inputs		Contacts loaded 15V, 10 mA
RS232	Speed:	9600 Baud
RS485	Speed:	9600 Baud
Ethernet	Speed: Functions:	10/100 MB DHCP
Web browser		Internet Explorer 8
SD Card	Type: Format:	Standard SD, SDHC FAT12, FAT16, FAT32
CPU	Processor: Hard disk: RAM:	48 MHz 4 MB 1 MB
Protection		IP65
Ambient temperature		0 - 40 °C
Weight	IN = OUT: IN <> OUT:	ca. 2,8 kg ca. 4,0 kg
Casing	Dimensions: Built-in depth: Panel opening: Material:	240 x 174 x 107 mm 122 mm 240 x 174 mm ABS
Fuses	Relay (F2) : Primary (F1) :	4A slow 2,5A slow (115/25V, 230/24V and 240/24V) 2A slow
Current outputs	Max resistance:	500 Ohm
Current inputs	Supply : Supply load :	15 V max. 40 mA
CE	Immunity: Emission: Low voltage:	EN 61000-6-1, EN 61000-6-2 EN 61000-6-3, EN 61000-6-4 2006/95/EG

38.1. Casing dimensions
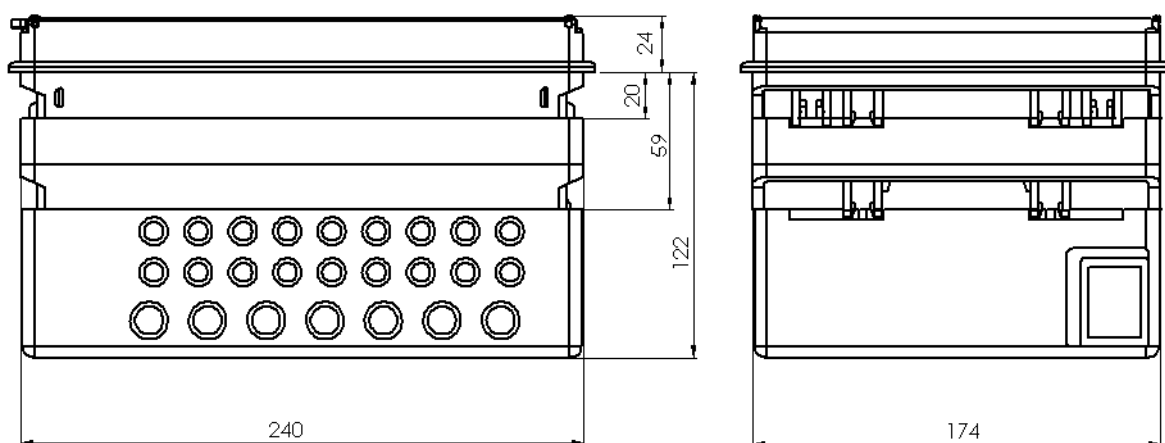
Subject to technical changes without notice

39. Index

40. Declaration of conformity

Declaration of conformity of the product with the essential requirement of the EMC directive 2014 / 30 / EU.

Product description

Product name   : Controller for softener and filter installation
Product type   : SFS8000
Manufacturer   : EWS Equipment for Water treatment Systems International B.V.
                            Australiëlaan 12
                            NL-5232 BB 's-Hertogenbosch
                            The Netherlands

Product environment

This product is intended for use in residential en light industrial environments.

Emission standard   : EN 61000-6-3
Immunity standard   : EN 61000-6-2
Low voltage directive : 2006/95/EG

Report

Report number   : EWS_RGS1121_3132_01

This declaration was issued by:

              Date   : 18-03-2020

              Name   : V. Naeber

              Signature   :

FIVE-YEAR CONTROLLER LIMITED WARRANTY

LIMITED WARRANTY
EWS International (hereafter EWS) warrants her products free from defects in material and workmanship under the following terms.
In this warranty, "Products" shall be taken to mean all devices that are supplied pursuant to the contract with exception of software.

VALIDITY OF THE WARRANTY
Labour and parts are warranted for five years from the date of the first customer purchase. This warranty is only valid for the first purchase customer.

Notwithstanding the warranty period of five years as mentioned above - while upholding the remaining provisions – a warranty period of three months applies to the supply of software.

COVER OF THE WARRANTY
Subject to the exceptions as laid down below, this warranty covers all defects in material or workmanship in the EWS products. The following are not covered by the warranty:

1) Any product or part not manufactured nor distributed by EWS. EWS will pass on warranty given by the actual manufacturer of products or parts that EWS uses in the product.
2) Any product, on which the serial number has been defaced, modified or removed.
3) Damage, deterioration or malfunction resulting from:
   a) Accident, misuse, neglect, fire, water, lightning or other acts of nature.
   b) Product modification or failure to follow instructions supplied by the products.
   c) Repair or attempted repair by anyone not authorized by EWS.
   d) Any shipment of the product (claims must be presented to the carrier)
   e) Removal or installation of the product
   f) Any other cause, which does not relate to a product defect.
   g) Cartons, equipment enclosures, cables or accessories uses in conjunction with the product.

FINANCIAL CONSEQUENTES
EWS will only pay for labour and material expenses for covered items, proceed from repairs and updates done by EWS at the EWS location. EWS will not pay for the following:
1) Removal or installations charges at customers and/or end user location.
2) Costs for initial technical adjustments (set-up), including adjustment of user controls or programming.
3) Shipping charges proceed from returning goods by the customer. (Shipping charges for returning goods to the customer are for the account of EWS).
All the costs which exceed the obligations of EWS under this Warranty, such as, but not limited to, travel and accommodation costs and costs for assembly and dismantling are for the account and risk of the customer.

WARRANTY SERVICE
In order to retain the right to have a defect remedied under this warranty, the customer is obliged to:
1) Submit complaints about immediately obvious errors related to the products delivered, in writing within eight days of the delivery of the products and submit complaints about shortcomings relating to the products delivered, which are not visible, within eight days of their being discovered.
2) Return defected products for account and risk of the customer. Costs for this shipment will not be reimbursed by EWS. The products may only be returned following express, written permission from EWS. Returning the products does not affect the obligation to pay the invoiced amounts.

3) Present the original dated invoice (or a copy) as proof of warranty coverage, which must be included in any [of the] return shipment of the product. Please include also in any mailing a contact name, company, address and a description of the problem(s).

LIMITATION OF IMPLIED WARRANTIES

Except where such disclaimers and exclusions are specifically prohibited by applicable law, the foregoing sets forth the only warranty applicable to the product, and such warranty is given expressly and in lieu of all other warranties, express or implied, or merchantability and fitness for a particular purpose and all such implied warranties which exceed or differ from the warranty set forth herein are hereby disclaimed by EWS.

EXCLUSION OF DAMAGES

EWS' liability for any defective products is limited to the repair or replacement of the product at our option. Except where such limitations and exclusions are specifically prohibited by applicable law EWS shall not be liable for:

1) Damage to other property caused by defects in the EWS product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss or:
2) Any damages, whether incidental, [consequential or otherwise] special, indirect or consequential damages, injury to persons or property, or any other loss.

Under no circumstances whatsoever shall EWS be obliged to provide compensation beyond the direct damage incurred by customer up to an amount not exceeding the payment receivable from the insurer of EWS in connection with the damage.

APPLICABLE LAW AND DISPUTES

1) Dutch law shall govern all offers made by EWS and all agreements concluded between EWS and customer. This warranty explicitly excludes application of the Vienna Sales Convention (CISG).
2) All disputes which may arise between the parties shall be dealt with exclusively by the competent court of law in the Netherlands under whose jurisdiction EWS falls. However, EWS reserves the right to submit any disputes to the competent court in the customer's location.