

Viscosity Processor 8001

User Manual



Ref: 130/18-3

Quality system certified



SOFRASER

ZI, 15 rue Nobel
45700 Villemandeur - France

info@sofraser.com - www.sofraser.com

+33 (0) 238 85 77 12 - Fax +33 (0) 238 85 99 65

IMPORTANT

BEFORE STARTING THE PROCESS, PROCEED TO THE OFFSET IN AIR ADJUSTMENT.

IT MEANS THAT THE ROUGH SIGNAL WILL BE SHIFTED TO THE REFERENCE "900" :





1. CLEAN AND DRY THE SENSOR ROD.
2. BE SURE THE PROCESS IS EMPTY.
3. INSTALL THE SENSOR ON THE PROCESS AND FIX IT WITH ITS 4 SCREWS.
4. ON VIEW #1, PRESS SIMULTANEOUSLY  +  +  KEYS DURING APPROXIMATELY 3 SECONDS.
"900" MUST BE INDICATED ON THE RED DISPLAY UNTIL THE THREE KEYS ARE PRESSED.
5. CHECK THE RED DISPLAY INDICATES "0" AS VISCOSITY VALUE.
6. PRESS CONTINUOUSLY  KEY AND CHECK THAT THE RED DISPLAY INDICATES 900 ± 0.5 .
OTHERWISE, REPEAT STEP #4.

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1. User Mode

You can change the view by pressing **Vue**.

	View n°1	View n°2
Red display	Viscosity measurement	Temperature measurement
Green display	Viscosity unit (cP, mPa.s, ...) or rod's frequency value (Hz)	Temperature unit (°C)

On view n°1, you can choose to display either the viscosity unit “cP” or the rod’s frequency by pressing **↔**.

2. Adjustment and configuration architecture

The 8001 electronic device have two modes for adjustment and configuration :

- **ADAPTATION mode :**

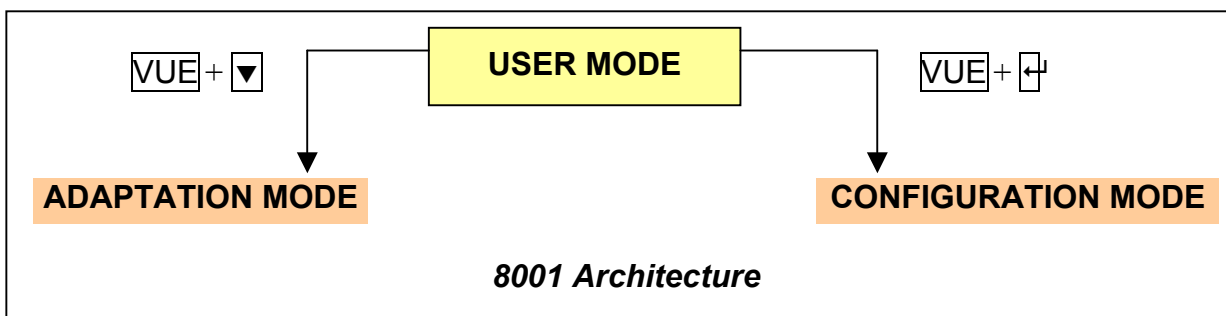
It enables to adjust parameters as :

- Linearization tables (re-calibration, thermal drift compensation) ;
- Alarms' thresholds and hysteresis ;
- Bargraphs' ranges ;
- Filtering parameters for inputs and outputs, ...

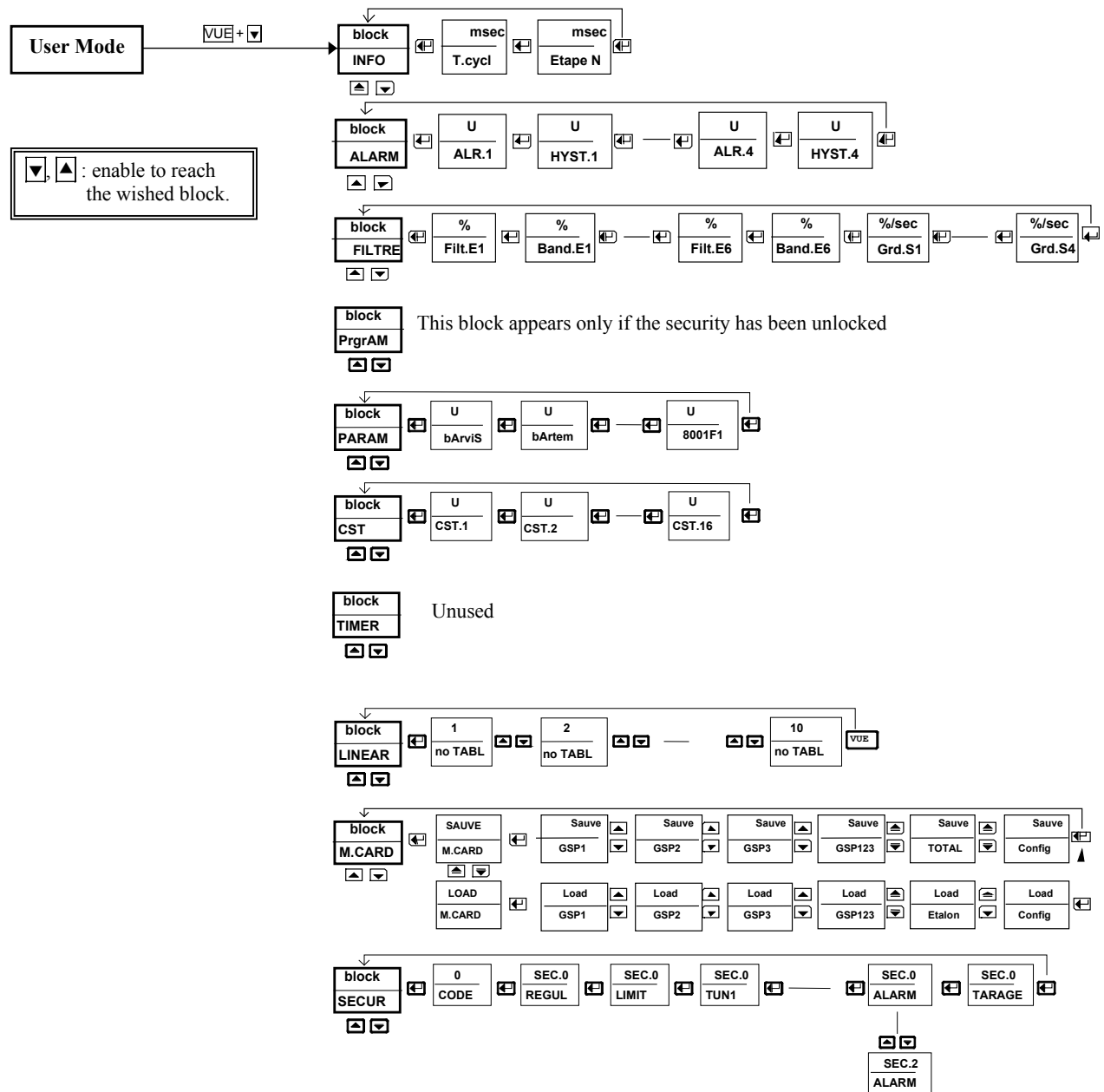
- **CONFIGURATION mode :**

It enables to define :

- The analog inputs' adjustment ;
- The alarm types ;
- The outputs' adjustment (relays, analog, digital),...



2.1. ADAPTATION diagram



Notes :

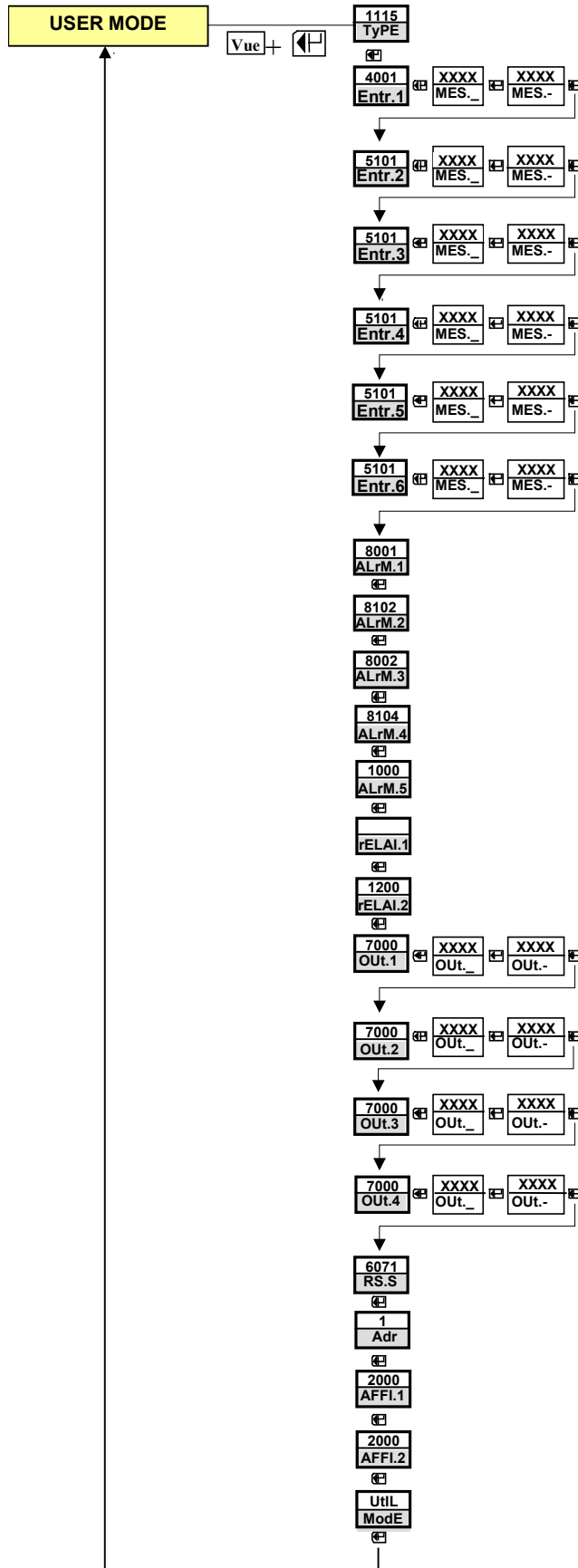
- All blocks, except « INFO » and « SECUR », can be protected (see § 7.7 in Technical Manual) and so, can appear or not in the diagram above.
- « M.CARD » block doesn't appear if the memory card is not inserted.

Warning :

All the functioning's programs are saved into « PRGRAM » block. Thus, all modifications will cause a dysfunction of the device. So, we advise you to not enter into this block.

In case of a handling error, it is possible to re-configure the device with the memory card (see § 10.1) or else contact your distributor.

2.2. CONFIGURATION diagram



3. Offset in air adjustment

The sensor active part must be clean and dry.

On view n°1, press simultaneously the following keys of the device's front panel :



Be sure before you stop pushing the keys that the red display indicates "900".
The upper display (red one) must indicate "0" when you stop pushing the keys.

4. Adjustment of the viscosity's re-calibration table

The manufacturing calibration is established with the sensor response's equation in function of standard oils' viscosities.

Equations' parameters are saved into 8001 program memories and are not modifiable. So, all the new calibration's points will be saved in the 8001 linearization table n°2.

4.1. Manufacture table's adjustment

The table is configured in manufacture with eleven points (n°0 to n°10) in order to have a gain equal to 1 and an offset equal to 0.

The following array contains the values of the manufacture adjustment :

Point 0	abs.00	0	ord.00	0
Point 1	abs.01	9999	ord.01	9999
Point 2	abs.02	9999	ord.02	9999
Point 3	abs.03	9999	ord.03	9999
Point 4	abs.04	9999	ord.04	9999
Point 5	abs.05	9999	ord.05	9999
Point 6	abs.06	9999	ord.06	9999
Point 7	abs.07	9999	ord.07	9999
Point 8	abs.08	9999	ord.08	9999
Point 9	abs.09	9999	ord.09	9999
Point 10	abs.10	9999	ord.10	9999























4.2. Adjustment of the table

The utilization of the table is needed when you have to make a new calibration of the sensor.

The procedure is the following one :

- Put the sensor on a rigid support and make the zero in air adjustment;
- Dive successively the sensor's rod (clean and dry) into several standard oils and write down for each of them the value displayed.
- Adjust the table of the 8001 module with these different measurements in the ascending order of viscosity.

Advice : to re-calibrate the sensor, only 6 or 7 points are necessary.

Step 1	In USER MODE, press simultaneously VUE +  . You are in ADAPTATION mode.		
Step 2	Move to the block " LinEAR " ( or ) then press  .		
Step 3	Press  to move to the table n°2 : Press  .		
Step 4	Upper displays indicate now : <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">0</td></tr><tr><td style="text-align: center;">POInt</td></tr></table> Press  .	0	POInt
0			
POInt			
Step 5	Adjust the abscissa " AbS. 00 " of the point n°0 with  and  , and then press  .		
	You can move the decimal point by pressing simultaneously  and  .		
Step 6	Adjust the ordinate " Ord. 00 " of the point n°0 with  and  , and then press  .		
Step 7	Upper displays indicate now : <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">1</td></tr><tr><td style="text-align: center;">POInt</td></tr></table> Press  .	1	POInt
1			
POInt			
Step 8	Adjust the abscissa " AbS. 01 " of the point n°1 with  and  , and then press  .		
Step 9	Adjust the ordinate " Ord. 01 " of the point n°1 with  and  , and then press  .		

Step 10	Repeat steps 8 and 9 to modify the co-ordinates of the other points. If you don't use all the table's points, adjust the remaining point's co-ordinates with the coordinates of the last calibration point.
Step 11	To come back to the USER Mode, press simultaneously \boxed{VUE} + $\boxed{\blacktriangledown}$.
Step 12	After fixing the sensor on the process line don't forget to adjust the "offset in air" : in view n°1, press simultaneously on $\boxed{R/L}$ + $\boxed{\blacktriangle}$ + $\boxed{\blacktriangleleft}$.

4.3. How to insert one point between two points

Example : you want to insert one point between point n°1 and point n°2.

Step 1	In USER MODE, press simultaneously \boxed{VUE} + $\boxed{\blacktriangledown}$. You are in ADAPTATION mode.
Step 2	Move to the block "LInEAr" ($\boxed{\blacktriangle}$ or $\boxed{\blacktriangledown}$) then press $\boxed{\blacktriangleleft}$.
Step 3	Move to table n°2 and press $\boxed{\blacktriangleleft}$.
Step 4	Move to the point n°1 with $\boxed{\blacktriangle}$.
Step 5	<p>Insert now the new point as follows :</p> <ul style="list-style-type: none"> - Press \boxed{VUE} to make appear the letter "I" (like Insert) on the View display and press $\boxed{\blacktriangleleft}$. - As soon as the View display indicates "M", press $\boxed{\blacktriangle}$. Upper displays indicates now : <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> 2 POInt </div> <p>The new point is called point n°2 and the old point n°2 is now called point n°3.</p> <ul style="list-style-type: none"> - Adjust the coordinates of the new point as described in steps 4, 5 & 6 on § 4.2.
Step 6	Press simultaneously \boxed{VUE} + $\boxed{\blacktriangledown}$ to come back to the USER Mode.

4.4. How to erase one point

Example : you want to erase the point n°2.

Step 1	In USER MODE, press simultaneously VUE + ▼ . You are in ADAPTATION mode.
Step 2	Move to the block “ LinEAr ” (▲ or ▼) then press ↵ .
Step 3	Move to table n°2 and press ↵ .
Step 4	Move to the point n°2 with ▲ .
Step 5	Press VUE to make appear the letter “ E ” (like Erase) on the View display and then press ↵ . Wait until “ M ” is displayed on the View display.
Step 6	Press simultaneously VUE + ▼ to come back to the USER Mode.

5. Adjustment of the viscosity’s current output

You can adjust the range of the current output in order to zoom in on a range of viscosity.

For example :

- Range of the sensor : 0 - 1 000 cP
- Working range : 200 - 500 cP
- Current output configuration : 4..20 mA

So you will adjust the current output as follows :

- 4 mA → 200 cP.
- 20 mA → 500 cP.

Step 1	In USER MODE, press simultaneously VUE + ↵ . The red and green displays indicate : <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> COnF MOdE </div> Press ↵ .
Step 2	Compute the security code and then press ↵ .

<p>Step 3</p>	<p>You are in CONFIGURATION mode. The red and green displays indicate :</p> <div style="text-align: center;"> <table border="1" data-bbox="820 255 948 340"> <tr> <td>1 1 1 5</td> </tr> <tr> <td>tyPE</td> </tr> </table> </div>	1 1 1 5	tyPE
1 1 1 5			
tyPE			
<p>Step 4</p>	<p>Press <input type="button" value="↵"/> several times until the green display indicates “Out.4”.</p> <p>The red display indicates :</p> <ul style="list-style-type: none"> - either “7 0 0 0” if the output is configured in 4..20 mA; - or “7 0 1 0” if the output is configured in 0..20 mA. <p><i>To change the current output’s configuration, adjust the 3rd digit with <input type="button" value="▲"/> and <input type="button" value="▼"/> (<input type="button" value="▶"/> to access to the next digit).</i></p> <p>Press another time <input type="button" value="↵"/>.</p>		
<p>Step 5</p>	<p>The green display indicates now “Out._” corresponding to the minimum physical value of the output.</p> <p><i>In the example : Out._ = 200 (cP).</i></p> <p>Adjust this parameter (<input type="button" value="▲"/> and <input type="button" value="▼"/>) and then press <input type="button" value="↵"/>.</p> <p><i>Remind : press simultaneously <input type="button" value="▲"/> and <input type="button" value="▼"/> to move the decimal point.</i></p>		
<p>Step 6</p>	<p>The green display indicates now “Out.’” corresponding to the maximum physical value of the output.</p> <p><i>In the example : Out.’ = 500 (cP).</i></p> <p>Adjust this parameter (<input type="button" value="▲"/> and <input type="button" value="▼"/>) and then press several times <input type="button" value="↵"/> until the red and green displays indicate :</p> <div style="text-align: center;"> <table border="1" data-bbox="820 1326 948 1411"> <tr> <td>U t I L</td> </tr> <tr> <td>MOdE</td> </tr> </table> </div> <p>Press <input type="button" value="↵"/>.</p> <p>You are back in USER mode.</p>	U t I L	MOdE
U t I L			
MOdE			

6. Adjustment of bargraphs

For each view (viscosity and temperature), you have a bargraph that you can adjust in function of your working ranges.

Example :

- Sensor's range : 0-1000 cP;
- Maximum viscosity into the process : 700 cP (100% of bargraph);
- Maximum temperature into the process : 100 °C (100% of bargraph).

Step 1	In USER MODE, press simultaneously VUE + ▼ . You are in ADAPTATION mode. Move to the block " PArAM " (▲ or ▼) then press ↵ .
Step 2	Adjust the viscosity threshold : " bArviS " = 700. <i>Remind : press simultaneously ▲ and ▼ to move the decimal point.</i> Press ↵ .
Step 3	Adjust the temperature threshold : " bArten " = 100.
Step 4	Press simultaneously VUE + ▼ to come back to the USER Mode.

7. Adjustment of the alarms

Objective : Adjust the thresholds (high and low) and the hysteresis of the viscosity and temperature alarms.

Example :

- | | | | |
|-----------|--------------------------|---|-----------------------------|
| Alarm 1 : | High threshold = 100 cP | → | Matched hysteresis = 10 cP |
| Alarm 2 : | Low threshold = 20 cP | → | Matched hysteresis = 2 cP |
| Alarm 3 : | High threshold = 72,5 °C | → | Matched hysteresis = 3 °C |
| Alarm 4 : | Low threshold = 55 °C | → | Matched hysteresis = 1,5 °C |

This means :

- Alarm 1 is activated when the viscosity is superior to 100 cP and stays active as long as the measurement will be superior to 90 cP.
- Alarm 2 is activated when the viscosity is inferior to 20 cP and stays active as long as the measurement will be inferior to 22 cP.
- Alarm 3 is activated when the temperature is superior to 72,5 °C and stays active as long as the measurement will be superior to 69,5 °C.
- Alarm 4 is activated when the temperature is inferior to 55 °C and stays active as long as the measurement will be inferior to 56,5 °C.

Step 1	In USER MODE, press simultaneously $\boxed{\text{VUE}}$ + $\boxed{\blacktriangledown}$. You are in ADAPTATION mode. Move to the block “ ALARME ” ($\boxed{\blacktriangle}$ or $\boxed{\blacktriangledown}$) then press $\boxed{\leftarrow}$.
Step 2	Adjust the high threshold of viscosity : “ SEUIL 1 ” = 100. Press $\boxed{\leftarrow}$. Remind : to move the decimal point, press simultaneously $\boxed{\blacktriangle}$ and $\boxed{\blacktriangledown}$.
Step 3	Adjust the matched hysteresis : “ HySt 1 ” = 10. Press $\boxed{\leftarrow}$.
Step 4	Adjust the low threshold of viscosity : “ SEUIL 2 ” = 20. Press $\boxed{\leftarrow}$.
Step 5	Adjust the matched hysteresis : “ HySt 2 ” = 2. Press $\boxed{\leftarrow}$.
Step 6	Adjust the high threshold of temperature : “ SEUIL 3 ” = 72,5. Press $\boxed{\leftarrow}$. Remind : to move the decimal point, press simultaneously $\boxed{\blacktriangle}$ and $\boxed{\blacktriangledown}$.
Step 7	Adjust the matched hysteresis : “ HySt 3 ” = 3. Press $\boxed{\leftarrow}$.
Step 8	Adjust the low threshold of temperature : “ SEUIL 4 ” = 55. Press $\boxed{\leftarrow}$.
Step 9	Adjust the matched hysteresis : “ HySt 4 ” = 1,5. Press $\boxed{\leftarrow}$.
Step 10	Press simultaneously $\boxed{\text{VUE}}$ + $\boxed{\blacktriangledown}$ to come back to the USER Mode.

8. Allocations Alarms/Relays

You have 4 software alarms (configured as described in the array below) with which can be allocated two relays.

	Alarm n°	Threshold	LED n°
Viscosity	1	High	1
	2	Low	2
Temperature	3	High	3
	4	Low	4

Example :

- Relay n°1 allocated to alarm n°1
- Relay n°2 allocated to alarm n°2

Step 1	<p>In USER MODE, press simultaneously √UE + ←.</p> <p>The red and green displays indicate :</p> <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>COnF</p> <p>MOdE</p> </div> <p>Press ←.</p>																				
Step 2	<p>Compute the security code and then press ←.</p>																				
Step 3	<p>You are in CONFIGURATION mode. The red and green displays indicate :</p> <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>1 1 1 5</p> <p>tyPE</p> </div>																				
Step 4	<p>Press ← several times until the green display indicates “rELAI.1”.</p> <p>Configure the relay n°1 in order to be allocated to the wished alarm.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;">DIGIT N° 1</th> <th style="width: 50%;">DIGIT N° 2 <i>(matched alarm)</i></th> <th style="width: 12.5%;">DIGIT N° 3</th> <th style="width: 12.5%;">DIGIT N° 4 <i>(Action sense)</i></th> </tr> </thead> <tbody> <tr> <td style="border: 1px solid black; width: 25px; height: 20px;">1</td> <td style="border: 1px solid black; width: 100px; height: 40px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;">0</td> <td>Alarm 1</td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;">1</td> <td>Alarm 2</td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;">2</td> <td>Alarm 3</td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;">3</td> <td>Alarm 4</td> </tr> </table> </td> <td style="border: 1px solid black; width: 40px; height: 20px;">0</td> <td style="border: 1px solid black; width: 100px; height: 40px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;">0</td> <td>Positive logic</td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;">1</td> <td>Negative logic</td> </tr> </table> </td> </tr> </tbody> </table> <p><i>In the example : rELAI.1 = 1 0 0 0</i></p> <p><i>Remind : press ▶ to access to the next digit.</i></p> <p>Press ←.</p>	DIGIT N° 1	DIGIT N° 2 <i>(matched alarm)</i>	DIGIT N° 3	DIGIT N° 4 <i>(Action sense)</i>	1	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;">0</td> <td>Alarm 1</td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;">1</td> <td>Alarm 2</td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;">2</td> <td>Alarm 3</td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;">3</td> <td>Alarm 4</td> </tr> </table>	0	Alarm 1	1	Alarm 2	2	Alarm 3	3	Alarm 4	0	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;">0</td> <td>Positive logic</td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;">1</td> <td>Negative logic</td> </tr> </table>	0	Positive logic	1	Negative logic
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1	Alarm 2																				
2	Alarm 3																				
3	Alarm 4																				
0	Positive logic																				
1	Negative logic																				
Step 5	<p>Configure in the same way the relay n°2 : “rELAI.2” .</p> <p><i>In the example : rELAI.2 = 1 1 0 0</i></p> <p>Press several times ← until the red and green displays indicate :</p> <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>U t I L</p> <p>MOdE</p> </div> <p>Press ←.</p> <p>You are back in USER mode</p>																				

9. Deactivation of the alarms

Step 1	<p>In USER MODE, press simultaneously VUE + ↵.</p> <p>The red and green displays indicate :</p> <div style="text-align: center; border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> COnF MOdE </div> <p>Press ↵.</p>
Step 2	<p>Compute the security code and then press ↵.</p>
Step 3	<p>You are in CONFIGURATION mode. The red and green displays indicate :</p> <div style="text-align: center; border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> 1 1 1 5 tyPE </div>
Step 4	<p>Press ↵ several times until the green display indicates "AlrM.1".</p> <p>To deactivate all the alarms you just have to disabled alarm n°1 by adjusting the code value with the following one :</p> <p style="text-align: center;">AlrM.1 = 1 0 0 1</p> <p><i>Remind :</i></p> <ul style="list-style-type: none"> ▪ Press ▶ to access to the next digit. ▪ Press ▲ or ▼ to modify the digit value. <p>Press several times ↵ until the red and green displays indicate :</p> <div style="text-align: center; border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> U t I L MOdE </div> <p>Press ↵.</p> <p>You are back in USER mode</p>

Note :

to re-activate the alarms, follow this procedure and replace the first digit of "AlrM.1" code value with "8".

Example :

	Activated	Deactivated
Alarm n°1	8 0 0 1	1 0 0 1

10. Utilization of the memory card

With this card, you can :

- load a configuration and parameters from the memory card to the device;
- save the configuration and the parameters of the device on the memory card.

10.1. Loading from the memory card to the device

Step 1	<p>Lift up the front panel and then pull it up to the stop.</p> <p>Revolve the panel and insert the memory card.</p> <p>Insert the memory card into the slot (card's printed front toward the device's inside part)</p>
Step 2	<p>The red and green displays indicate :</p> <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>LECT</p> <p>COonFIG</p> </div> <p>Press <input type="button" value="↵"/>.</p> <p>Wait until the green display indicates "Good".</p> <p>Still wait few seconds and the device comes back in USER mode.</p>

10.2. Saving from the device to the memory card

10.2.1. Security's unlocking

In manufacture configuration, the saving operation from the device to the memory card is forbidden. So, in a first time, you have to unlock the security following to the procedure described below :

Step 1	<p>In USER MODE, press simultaneously <input type="button" value="VUE"/> + <input type="button" value="▼"/>.</p> <p>You are in ADAPTATION mode.</p> <p>Move to the block "SECUR" (<input type="button" value="▲"/> or <input type="button" value="▼"/>) then press <input type="button" value="↵"/>.</p>
Step 2	<p>Compute the access code and press <input type="button" value="↵"/>.</p>
Step 3	<p>Press several times <input type="button" value="↵"/> to reach "M.CARD" block (indicated on green display).</p> <p>The red display must indicate "SEC1".</p>
Step 4	<p>Adjust, by means of <input type="button" value="▼"/>, the security level in order to have indicated "SEC0" on red display.</p>
Step 5	<p>Press simultaneously <input type="button" value="VUE"/> + <input type="button" value="▼"/> to come back to the USER Mode.</p>

10.2.2. Saving operation

Step 1	Lift up the front panel and then pull it up to the stop. Revolve the panel to insert the memory card.
Step 2	The red and green displays indicate : <div style="text-align: center; border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;"> LECT COntFIG </div> Press Vue .
Step 3	Press simultaneously VUE + ▼ to go to the ADAPTATION mode. The red and green displays indicate : <div style="text-align: center; border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;"> b l o c M.CArd </div> Press ↵ .
Step 4	Upper display indicate now <div style="text-align: center; border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;"> LECT M.CArd </div> Press ▲ .
Step 5	The green display indicates : “SAVE” Press ↵ .
Step 6	The green display indicates now : “tOtAL” Press ↵ . Wait until the green display indicates “Good” . Press ↵ . Press simultaneously VUE + ▼ to come back to USER mode.

Note :

After the saving operation, it is better to re-activate the security.

So, proceed as described in § 10.2.1 and select “SEC1” instead of “SEC0”.