



- HOME
- TOOL
- LIVE
- GRAPH
- CONTROL
- ALARM
- Uout
- Iout
- AUXin
- PID

# Operating manual

*calys* software

LUCIFER®

| bar | PSI | kPa | MPa |

Re-connect

● does not communicate

The *calys* software is your direct interface with electro-pneumatic pressure regulators type “ EPP4 comfort “.

*calys* enables you to parametrize the regulator connected to the PC or to view its status.

*calys* incorporates a regulator data history.

Introduction

Installation

Interface

Settings

## Parker Hannifin Manufacturing Switzerland SA

Fluid Control Division Europe

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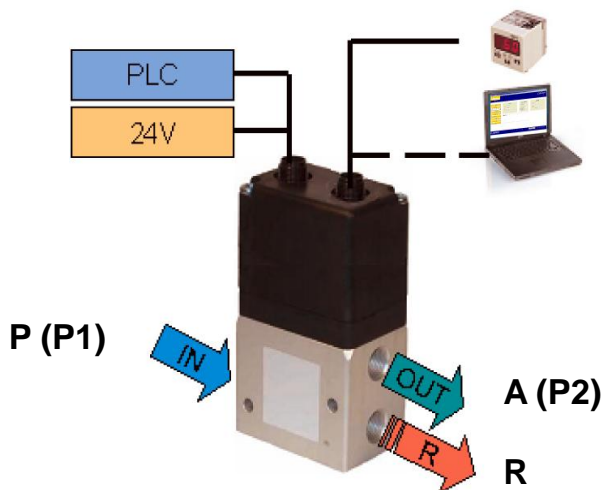
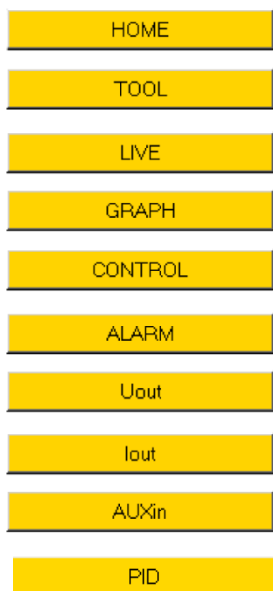
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Manual *calys* - English – version 4

The *calys* software was developed to control the electro-pneumatic pressure regulators series EPP4 comfort.



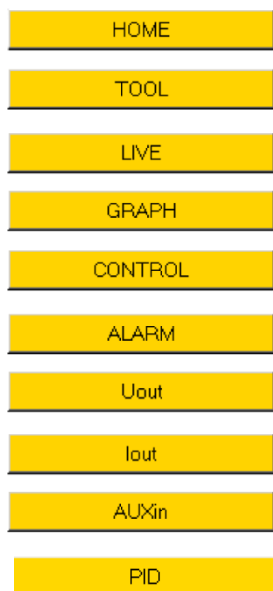
Note: In the software, the menu top right enables you to select the language; however to assist the updating of this document the screen-shots will be shown only in English.

The purpose of this manual is not to explain the operation of the regulator EPP4 but to serve as a guide for using the *calys* software.

The following colour code is employed to distinguish between read-only and modifiable fields:

- grey background, blue typeface: display fields
- grey background, black typeface: modifiable, non-accessible fields
- white background, black typeface: modifiable fields

To use the *calys* software a regulator EPP4 comfort must be connected to your PC. However, if you only wish to prepare a parameter file, you can create a new file (TOOL > New) or open an existing file (TOOL > Open); this will enable you to acquire values which can be used subsequently.



## Required configuration

- Intel Pentium2 500 MHz or equivalent.
- Microsoft Windows 2000, Windows XP or Windows 7.
- Recommended random access memory: 128 Mo.
- Minimum disc space: 40 Mo.
- Minimum monitor: 1024 x 768 pixels.
- Adobe Acrobat Reader 5 minimum.
- Free communication port RS232.

## Installation

1. Uninstall all previous versions.
2. Double click on the file CALYS.EXE to boot the installer.
3. The installer enables you to select the folder in which to install the *calys* software. By default, installation is proposed in the folder "Program Files".

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| bar | PSI | kPa | MPa |

Re-connect

 communicate

## Using the software

1. Start the *calys* software by double clicking on its icon  in the desktop or from the Windows start menu.

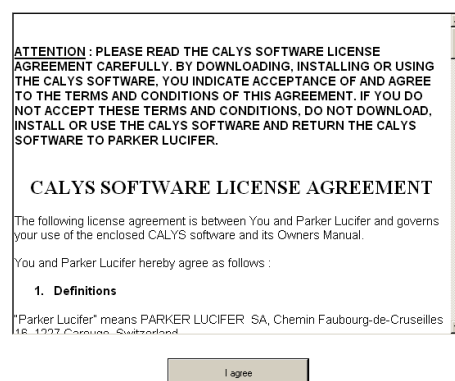
The window opposite will appear if no regulator is connected to the PC or if the selected Port COM is not the right one.

In both cases the connection pilot lamp is red.

See also "Port COMx selection" in TOOL.



2. On starting the software for the first time you are asked to accept the conditions of use before being able to complete the installation.




## Using this manual

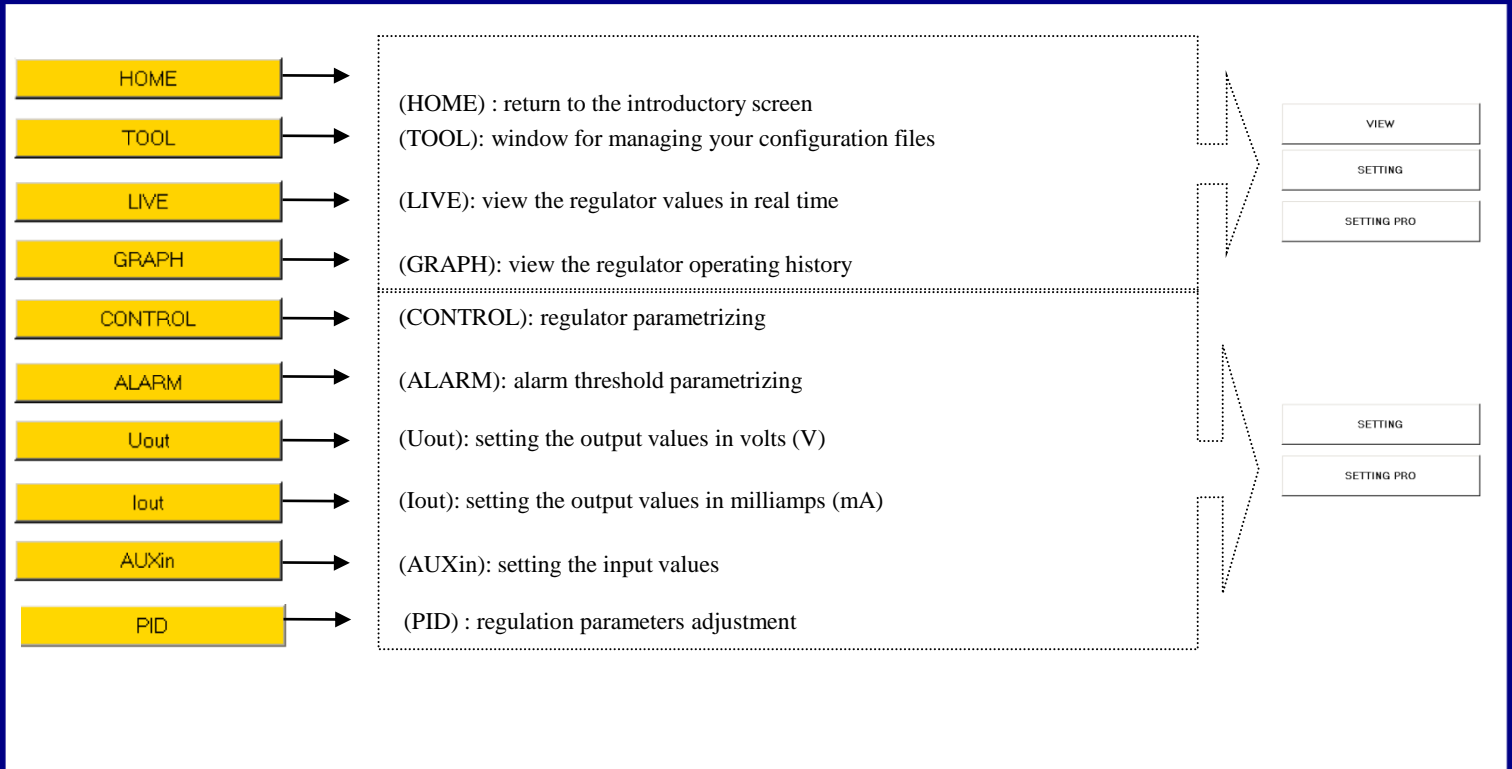
You can boot this document from the "?" top right in the software window.

This manual describes the functions available in the software.

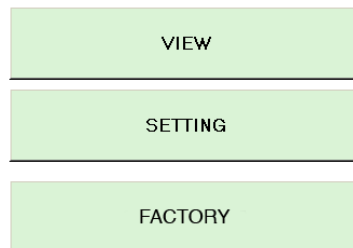
For direct access to the explanations to one or other of the functions, simply click on the corresponding button at the top of this document.

To return to the first page of this document, click on the logo  at the top left.





You can select the software utilisation mode in the menu “HOME”.



By selecting the input VIEW, you have access only to the tools required for managing the programming files (TOOL), the direct viewing of the values (LIVE) and the viewing of the operational history (GRAPH).

The inputs SETTING and FACTORY enable you to access all menus presented in this document. To access these you must enter the relevant password.



Only competent and authorised persons can modify parameters.  
The FACTORY menu is reserved for persons who have undergone appropriate training.  
Before and during any parameters modification, apply a control signal null.

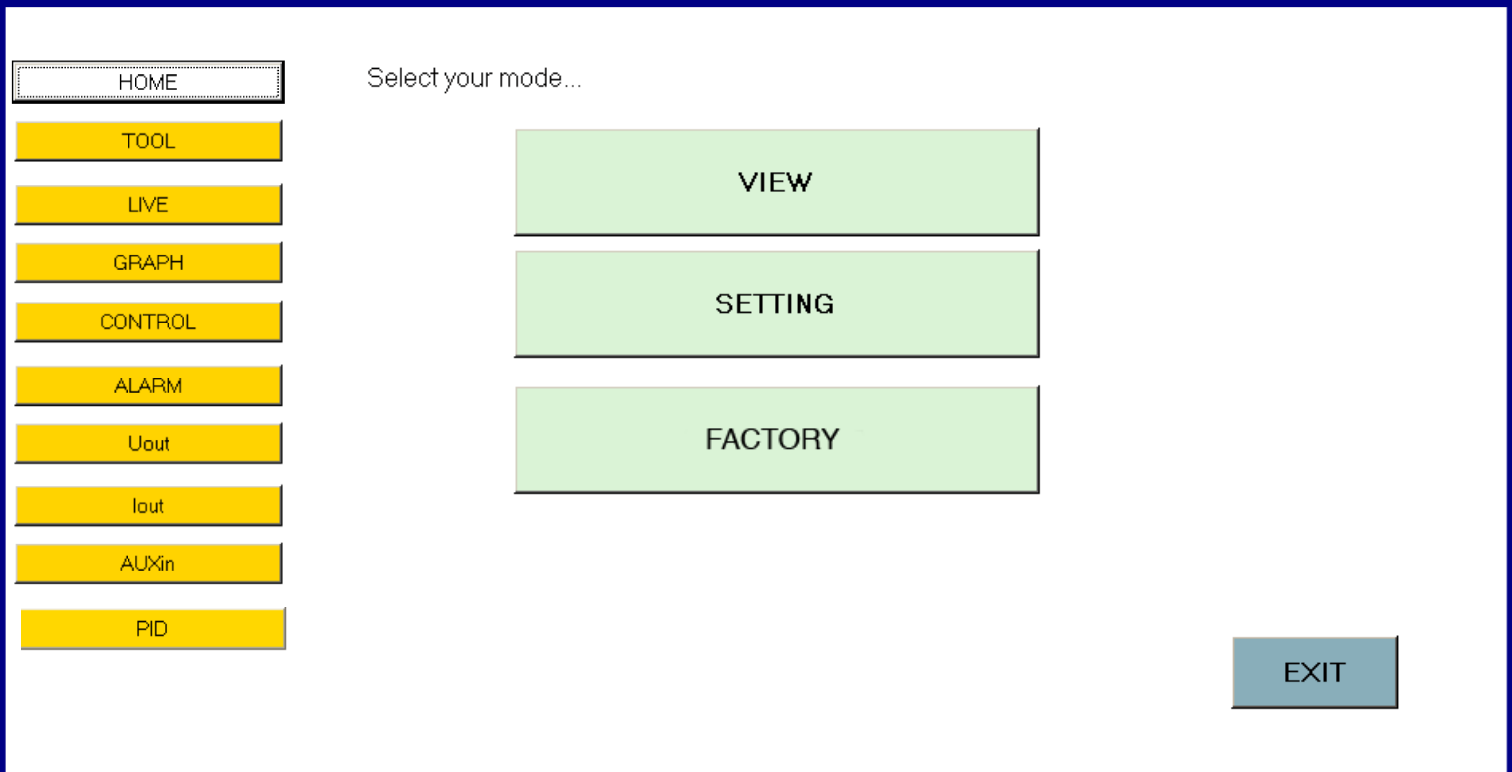
You can change the software language at any time by clicking on the relevant letter:

E = English / F = French / D = German / I = Italian

I E I F I D I I I

You can change the unit of pressure at any time by clicking on the desired abbreviation.

| bar | PSI | kPa | MPa |

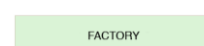


The menu “HOME” enables you to select the software utilisation mode.

- The input VIEW gives you access to the following tools:
  - TOOL
  - LIVE
  - GRAPH
- The inputs SETTING and FACTORY are accessible by password. In addition to the menus available in the input VIEW you have access to the following menus:
  - CONTROL
  - ALARM
  - Uout
  - Iout
  - AUXin
- The application can be closed with the button EXIT.
- The selected utilisation mode is indicated under the Parker logo, top left:



In the following pages we remind you whether this or that menu is available with reference to the input you have selected, by actuating the following buttons under the chapter heading:



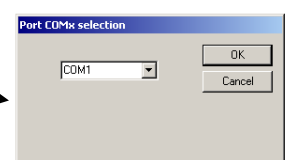
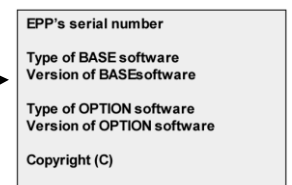
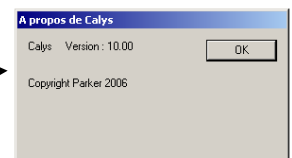
- HOME
- TOOL
- LIVE
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- PID

## File

- New
- Open
- Close
- Save
- Save as...
- Import from EPP
- Export to EPP
- Refresh calys
- About calys

- Restore
- EPP's information
- Pressure range
- Port COMx selection
- Re-connect

- New** → (New): create a new parameter file
- Open** → (Open): open an existing parameter file
- Close** → (Close): close the actual parameter file
- Save** → (Save): save the actual parameter file
- Save as...** → (Save as): save the actual parameter file under a new name
- Import from** → (Import from): import the existing parameters from the EPP to a file
- Export to** → (Export to): export the actual parameters from a file to the EPP
- About calys** → (Ref. calys): open the calys information window
- Refresh calys** → (Refresh calys): transfer the parameters of the EPP to calys
- Restore** → (Restore): restore the default values [factory settings]
- Pressure range** → (Pressure range) : permits to choose the pressure scale applied on the graph (default value is "Auto", where pressure scale will be adapted automatically to the pressure range of the EPP connected)
- EPP's information** → (EPP information): open the regulator information file
- Port COMx selection** → (Select port COMx): open the selection window of the input port to which the regulator is connected
- Re-connect** → (Re-connect): start again the connection to the selected port COM



HOME  
TOOL  
LIVE  
GRAPH  
CONTROL  
ALARM  
Uout  
Iout  
AUXin  
PID

### INPUTS

CTRL [mA]  ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

AUXin [V]  ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Test value

### MEASUREMENTS

Pout [bar]

24VDC [V]

Pout is read from  
☒ Internal sensor  
☐ AUXin

### OUTPUTS

Uout [V]  ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Iout [mA]  ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

ALARM ☐ ON ☒ OFF

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Test value

### MESSAGES

### OTHER VALUES

error [bar]

The green coloured zones are only available in FACTORY

The menu LIVE permits the direct reading of the regulator operating values.

### INPUTS:

- CTRL : permits reading the reference value in [V] (select U) or in [mA] (select I).
- AUXin : permits reading the reference value at the auxiliary input in [V] (select U) or in [mA] (select I).
- Test value : permits testing the values at the CTRL or AUXin. Just tick the relevant button before acquiring the value to be tested.

### MEASUREMENTS:

- Pout (bar) : permits reading the actual output pressure. This value can be read from the internal sensor or an external sensor.
- 24 VDC (V) : permits checking the regulator supply voltage, indicated in volts.

### OUTPUTS:

- Uout (V) : permits reading the value of the signal in volts corresponding to the output pressure.
- Iout (mA) : permits reading the value of the signal in milliamps corresponding to the output pressure.
- ALARM: this indicator permits checking whether the alarm is deactivated.
- Test value : permits testing the values at Uout, Iout or ALARM. Just tick the corresponding button, before setting a specified value to overwrite the standard value.

### MESSAGES:

This zone permits viewing the information messages concerning the regulator operation.

### OTHER VALUES:

Display of the deviation (in units of pressure) between the pressure P2 and the reference CTRL.



The menu GRAPH permits viewing the regulator operating history.

- ☒ CTRL
- ☒ AUXin
- ☒ Pout [bar]
- ☒ 24VDC [V]
- ☒ Uout [V]
- ☒ Iout [mA]
- ☒ ALARME

→ Tick the value(s) you wish to view.

- ☒ Capture



→ Tick the box "Capture" : a window opens so that you can select the location and the name of the file \*.csv corresponding to the record. You will then have access to the record control buttons (Record -Pause -Stop).

The file \*.csv can be opened with a spreadsheet for using the recorded data.

Base de temps

0.10 s/sa

→ Indicate the time interval between each stated value. Default value: 0.1 second.

5.00 s/div

→ Indicate the scale of the time grid. Default value: 5 second per division.

RE-START

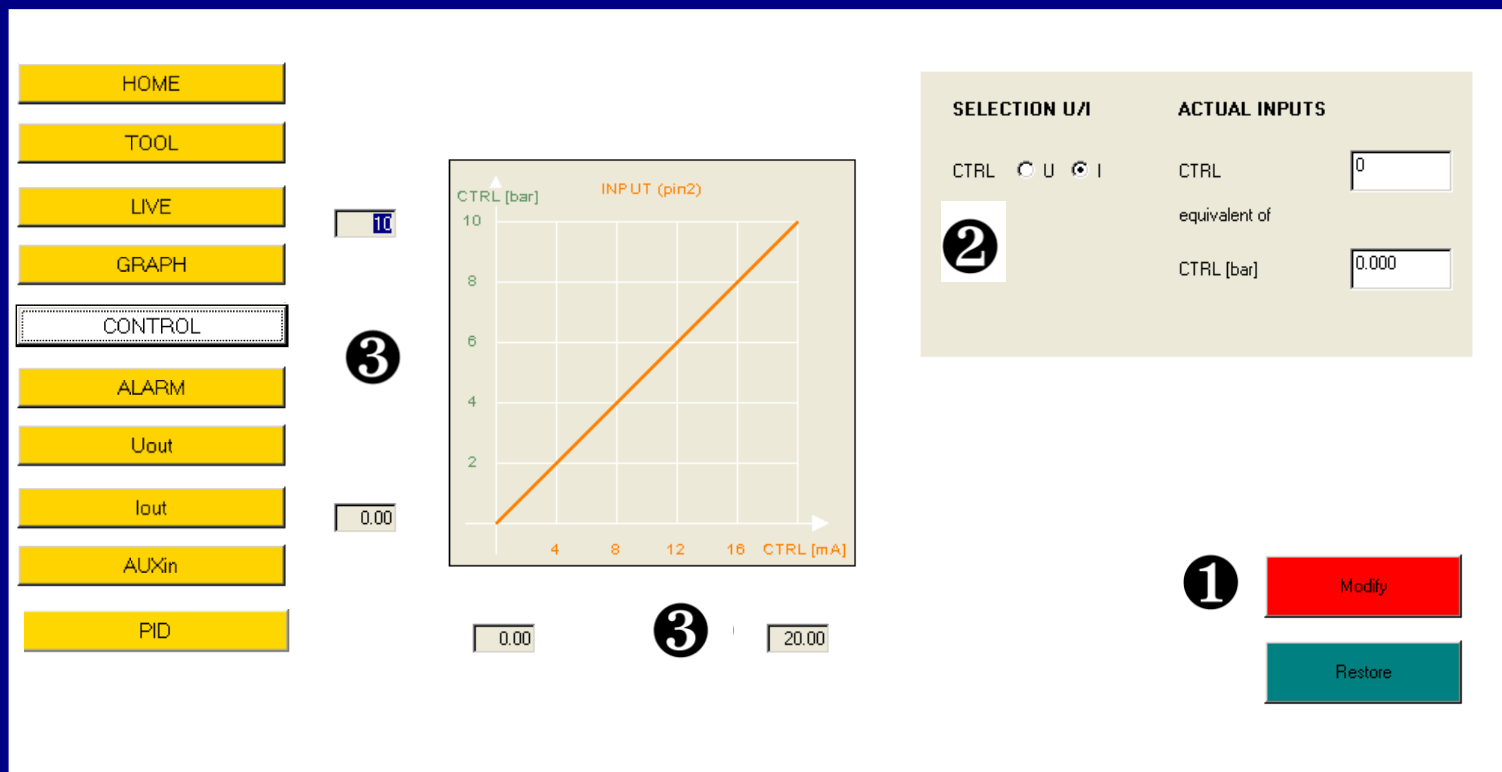
→ Click here to restart the history (reset to zero).

STOP

→ Click on STOP to stop the history.

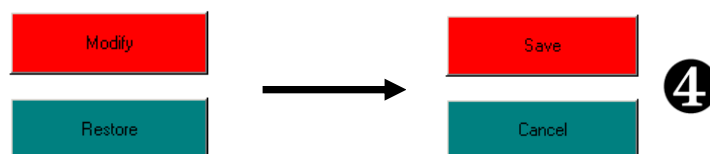
NOTA: pressure scale 0-10 bar is set on the vertical axis on the left of the graph. When the pressure scale (selected in the Menu "Pressure scales", see page 6) is higher than 10 bar, it will be set on the vertical axis on the right of the graph.





The menu CONTROL permits parametrizing the ratio between the regulator reference and the output pressure.

1. Click on Modify.



2. Select the unit of the reference.
3. Set the minimum and maximum values of the input (volts or milliamps) and the output (pressure according to the selected unit, in bars for example): the corresponding curve is displayed in real time.

Note: See the SETTINGS page for the factory settings and the limit values.

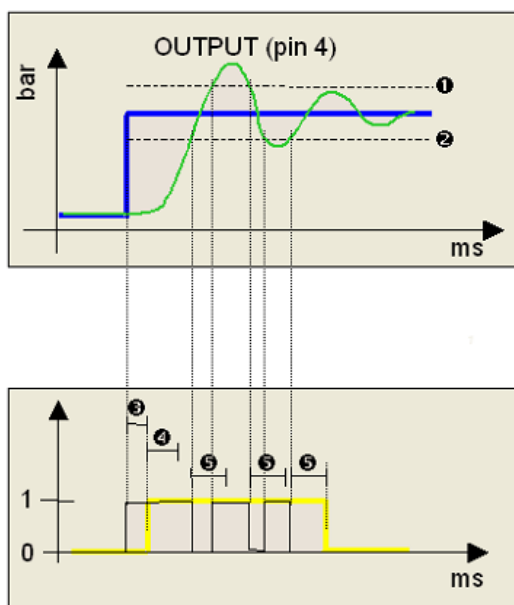
4. Click on Save to save the acquired values or on Cancel.
5. Wait until the confirmation window.
6. Reset the pressure regulator (turn 24VDC OFF and back ON).

The field ACTUAL INPUTS enables you to view the actual status of the regulator if this is connected to the PC.

Restore

The button RESTORE permits restoration of the factory settings.

- HOME
- TOOL
- LIVE
- GRAPH
- CONTROL
- ALARM**
- Uout
- Iout
- AUXin
- PID



**LOGIC**

ALARM ☒ + ☐ -

**ACTUAL OUTPUTS**

ACTUAL ☒ ON ☐ OFF

**PRESSURE LIMITS**

1-Error +  [bar]

2-Error -  [bar]

**TIMING LIMITS**

3-Delay ON  s

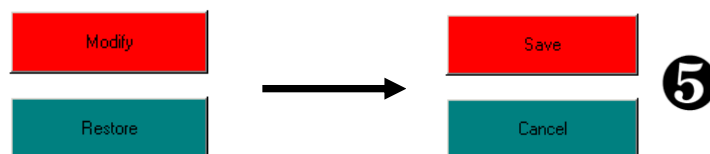
4-Ton min  s

5-Delay OFF  s

**1**

The menu ALARM permits the parametrizing of a digital output, such as an alarm.

1. Click on Modify.

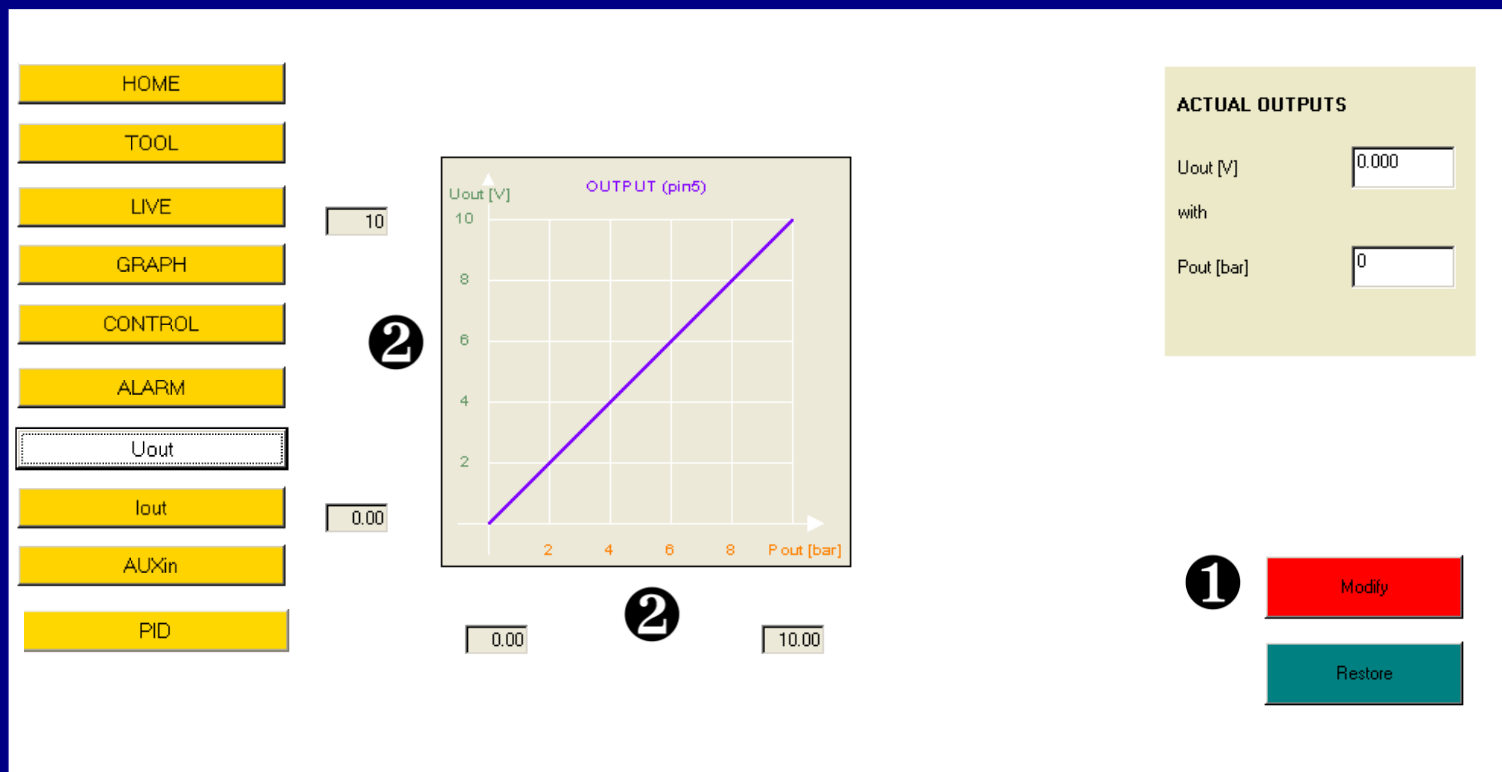


2. Select the type of alarm (high output if alarm = + ; or low output if alarm = -).
3. Set the desired minimum and maximum pressure values (according to the selected unit, in bars for example).

Note: See the SETTINGS page for the factory settings and the limit values.

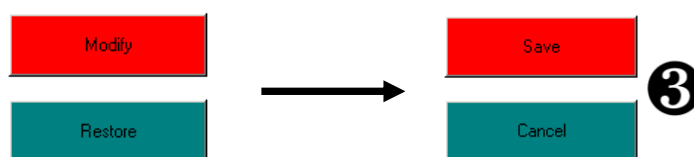
4. Set the delay values of the alarm signal.
5. Click on Save to save the acquired values or on Cancel.
6. Wait until the confirmation window.
7. Reset by switching the 24V supply OFF and back ON.

The field ACTUAL OUTPUTS allows you to see the status of the alarm signal if a regulator is connected.



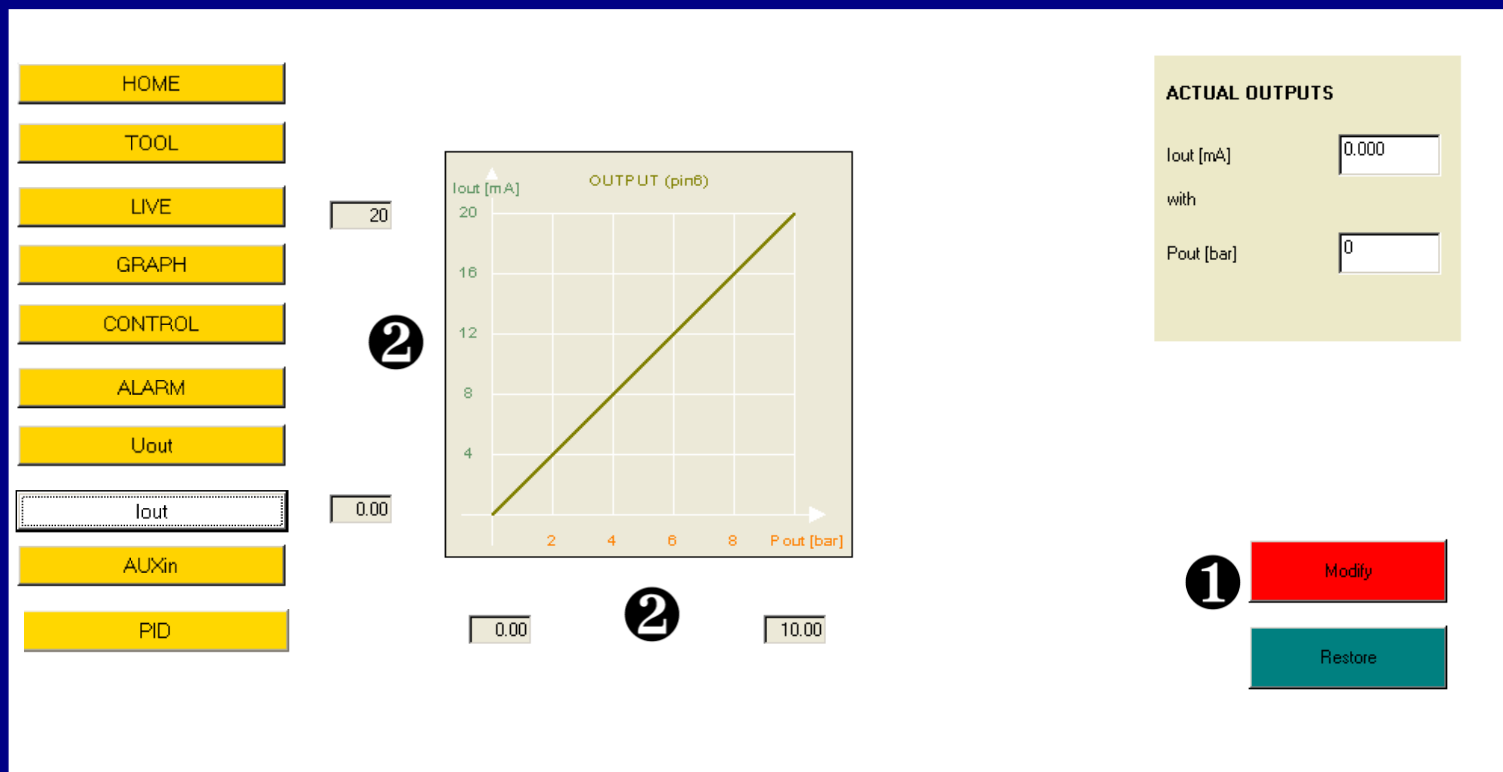
The menu Uout (Uout) permits the parametrizing of the output signal in volts.

1. Click on Modify.



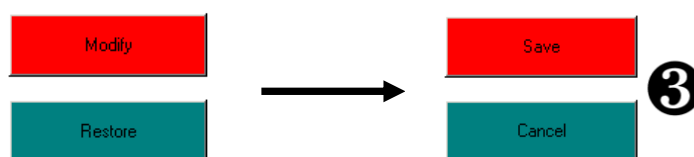
2. Set the minimum and maximum values at the output (volts) corresponding to the pressure range (according to the selected unit, in bars for instance): the corresponding curve is displayed in real time.
- Note: See the SETTINGS page for the factory settings and the limit values.
3. Click on Save to save the values or on Cancel.
4. Wait until the confirmation window.
5. Reset by switching the 24V supply OFF and back ON.

The field ACTUAL OUTPUTS enables you to view the actual status of the regulator if this is connected to the PC.



The menu Iout (Iout) permits the parametrizing of the output signal in milliamps.

1. Click on Modify.



2. Set the minimum and maximum values at the output (milliamps) corresponding to the pressure range (according to the selected unit, in bars for example): the corresponding curve is displayed in real time.

Note: See the SETTINGS page for the factory settings and the limit values.

3. Click on Save to save the acquired values or on Cancel.
4. Wait until the confirmation window.
5. Reset by switching the 24V supply OFF and back ON.

The field ACTUAL OUTPUTS enables you to view the actual status of the regulator if it is connected to the PC.

HOME

TOOL

LIVE

GRAPH

CONTROL

ALARM

Uout

Iout

**AUXin**

PID

10.0

0.0

0.0

10.0

**3**

**2**

SELECTION U/I	ACTUAL OUTPUTS
AUXin <input checked="" type="radio"/> U <input type="radio"/> I	AUXin [V] <input type="text" value="0.0"/>
	equivalent of
	AUXin [bar] <input type="text" value="0.0"/>

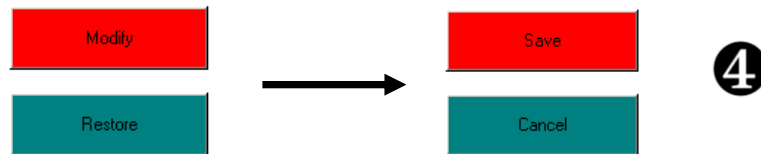
**1**

Modify

Restore

The menu AUXin (AUXin) permits the parametrizing of the values of the auxiliary input signal (an external sensor for example) in volts or milliamperes.

1. Click on Modify.



2. Select the unit of the reference (volts or milliamperes).

Note: The "P2 pressure" function is not available on the standard version of the EPP4 comfort.

3. Set the minimum and maximum values at the input (volts or milliamperes) corresponding to the pressure range (according to the selected unit, in bars for example): the corresponding curve is displayed in real time.

Note: See the SETTINGS page for the factory settings and the limit values.

4. Click on Save to save the acquired values or on Cancel.
5. Wait until the confirmation window.
6. Reset by switching the 24V supply OFF and back ON.

The field ACTUAL OUTPUTS enables you to view the actual status of the regulator if this is connected to the PC.



The button RESTORE permits restoration of the factory settings.

- HOME
- TOOL
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- PID

1

Kp High

Kp Low

Ki

Kd

3

**Warning:** regulators' specifications are guaranteed only with the initial values of PID parameters. These values are available in a table, paragraph "PID settings" of the Calys instruction manual

Modify

2

PID (PID) menu enables you to adjust each of the four regulation parameters of the EPP4 individually. This adjustment modifies the regulator's behaviour, making it more or less reactive for each application.

1. Values indicated are those already implemented into the pressure regulator.
2. Click on Modify .

Modify



Save

4

3. Adjust the values in order to match the required behaviour. A higher gain will result in a more reactive behaviour, and vice versa. For each parameter, minimum value is 0, maximum value is 255.
  - Kp High: proportional gain (medium to high pressure => regulated pressure > 500 mbar)
  - Kp Low: proportional gain (low pressure => regulated pressure < 500 mbar)
  - Ki: integrator gain
  - Kd: derivator gain
4. Click on Save to validate the new values or on Cancel.
5. Wait until the confirmation window.
6. Reset by switching the EPP4 24V supply OFF and back ON.

### Factory values of PID parameters

Preset values for each regulator depend on the EPP4 type (size and maximum pressure) and are indicated in the table opposite.

To get back to the original behaviour, you need to re-enter the values from the table.

Type EPP4	Kp High	Kp Low	Ki	Kd
P4Cx2xxx	50	100	2	200
P4Cx40xx	150	200	8	100
P4Cx41xx	100	133	5	0
P4Cx42xx	50	75	4	0
P4Cx61xx	150	200	8	100
P4Cx62xx	50	100	5	100
P4Cx91xx	150	200	8	100

## Principal settings made at the factory for EPP4

Pressure regulator EPP4 is calibrated and checked at the factory according to the specifications.  
The principal settings made at the factory are as follows:

Input signal Calibration	Uout calibration	Iout calibration	Alarm Logic	+ error alarm	- error alarm	Alarm delay ON	Acoustic Alarm min	Alarm delay OFF
0-10 V or 4-20 mA 0-10 bar 0-20 bar	0-10 bar 0-10 V 0-20 bar	0-10 bar 4-20 mA 0-20 bar	negative	0.5 bar 1 bar	0.5 bar 1 bar	0	0	0

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| bar | PSI | kPa | MPa |

Re-connect

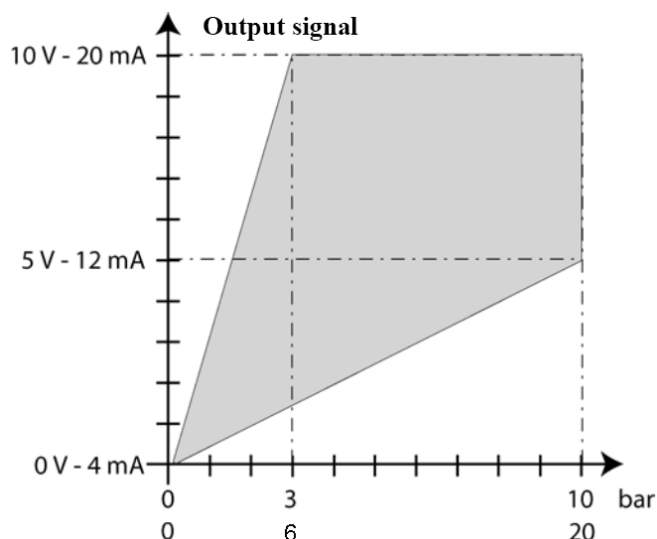
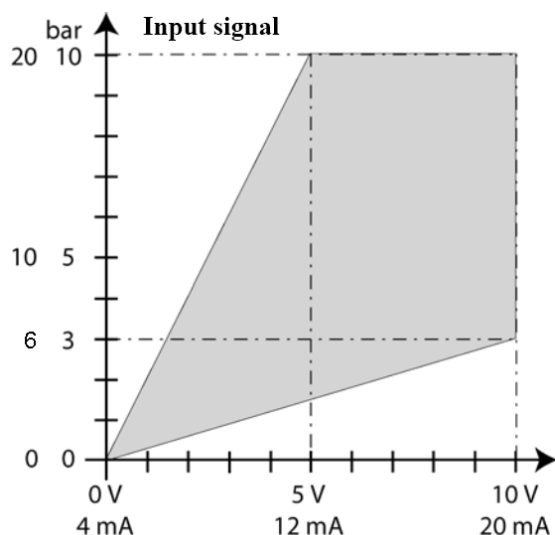
communicate

## Optimum settings

Chart: settings for regulators having a pressure range  $\leq 10$  bar

Parameters	MIN	MAX	Accuracy
Input signal U	0 V	10 V	0.015 V
Input signal I	4 mA	20 mA	0.02 mA
Pressure limit alarm	0 s	-	0.1 s
Timing limit alarm	0 s	5 s	0.05 s
U <sub>OUT</sub>	0 v	10 V	0.1 V
I <sub>OUT</sub>	4 mA	20 mA	0.16 mA

To obtain the best performances from the EPP the settings must be kept within the following shaded zones:



Use the appropriate axis scale in relation to the type of regulator ( 0-10 bar, 0-20 bar)