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Version: Calys User Manual – English version





User Manual Calys Software

• The Calys software is your direct interface with electro-pneumatic pressure regulators



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1. Introduction

1.1 About EPPs

Parker FCDE offers a large range of proportional pressure regulators named EPP4, with sizes from ¼" up to 2". EPP4 regulators provide high precision, low power consumption, long life expectancy, and reliability even in harsh environments. The range is available with 2 different levels of electronics, Basic and Comfort. The Comfort versions offer the capability to connect a PC to the regulator in order to adjust all the parameters of the pressure regulator using Calys software.

1.2 About Calys

The Calys software was developed to control the electro-pneumatic pressure regulators EPP4 Comfort series. Calys enables the EPP4 user to do live monitoring, to calibrate input and output signals, to adjust alarms, to record all parameters in an Excel file, and to adjust PID parameters.

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

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

1.3 About third-party software

Calys software is built on the Qt Framework by The Qt Company, licensed under the LGPL, versions 2.1 and 3.

Calys software uses the QWT library for displaying graphs. This library is licensed under the QWT license.

Calys software uses LibXml2 by Daniel Veillard, for reading XML files. This library is licensed under an MIT-styled license.

The text of all these licenses can be found under the directory in which Calys has been installed.



2. Start with Calys

2.1 Minimum system requirements

Calys software is compliant with the following Windows versions:

- Windows 7 (32 or 64 bits)
- Windows 8.1 (32 or 64 bits)
- Windows 10 (32 or 64 bits)

The software interface is developed for a minimal screen resolution of 1024x768. Under this screen resolution, the interface display is not guaranteed and a scroll bar will appear.

One serial port (USB or RS232) is needed for the communication between PC and EPP.

The minimum amount of disc memory needed is around 51MB.

The recommended random access memory is 128MB.

2.2 Downloading

Calys software is available on the Parker web site at the following address:

http://www.parker.com/fcde/support

You must accept the license agreement to download the software.

At the same location, you can also find a link to download open source Qt libraries used by the Calys application.

2.3 Installation

After downloading the executable file, you can start the installation by double clicking on it.

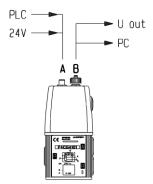
Then follow the instructions given by the installer. You can select between 4 languages: English, French, German, and Italian.

2.4 Start and Connection

To start the Calys software, double-click on the following icons:

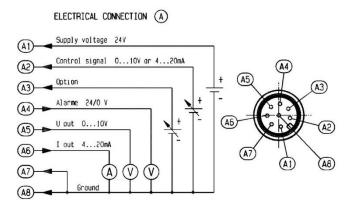


On the EPP regulator, there are 2 M12 connectors:





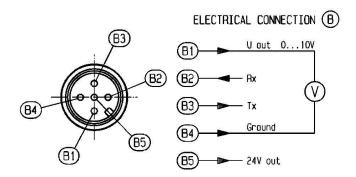
The main connector (A) adopted is a standard 8 pole-M12 used to connect Power (24Vdc) and an automate PLC:



The female connector to mount is the 8 pole M12 connector (IEC 61076-2-101 model LF). Example:

Parker	496796	http://www.parker.com
1	I	

The connector (B) is a standard 5 pole M12 used to connect EPP to a PC due to specific digital cable connection accessories, reference. 496449:



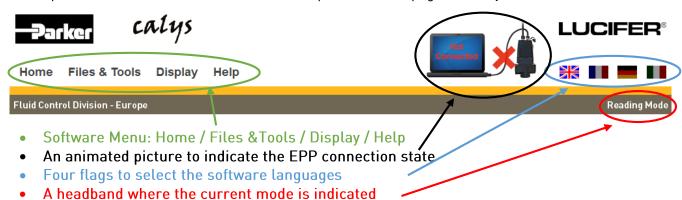
The female connector to mount is the 5 pole M12 connector (IEC 61076-2-101 model LF).

2.5 Software interface

When you start Calys software for the first time, you see the following window:



On the top of the window, there is a header that is present on all pages. On it, you can see:



On the bottom of the window, there is a footer that is also present on all pages:



Four buttons to select the pressure unit

2.5.1 Menu

2.5.1.1 Description

The display menus depend on the selected user mode.

• In Reading mode, the available menus and submenus are:

Home	Files & Tools	Display	Help
		Digital	Calys manual
		Graphic	Online EPP catalogue
			About Calys
			About EPP (only if connected)

• In Setting mode, the available menus and submenus are:

Home	Files & Tools	Display	Setting	Help
		Digital	Control signal	Calys manual
		Graphic	Alarm	Online EPP catalogue
			Output [V]	About Calys
			Output [I]	About EPP (only if connected)
			External sensor	
			PID	

The table below quickly describes the function of each page:

Menu	Submenu	§	Description
Home		3	Return to the home page where you can change user mode.
Files & Tools		4	Window for managing your configuration files.
Display		5	Menu to observe and control the EPP regulator values.
	Digital	5.1	View and manually control the EPP regulator values
	Graphic	5.2	View and record the regulator operating history
Setting		6	Menu to modify the calibration of the connected EPP.
	Control signal	6.1	Window to modify the calibration of the input control signal
	Alarm	6.2	Window to parameterize threshold of the alarm output signal
	Output [V]	6.3	Window to modify the calibration of the output voltage signal
	Output [I]	6.4	Window to modify the calibration of the output current signal
	External sensor	6.5	Window to modify the calibration of the external sensor input signal
	PID	6.6	Window to adjust the regulation parameters
Help		2.6	
	Calys manual	-	Open this manual
	Online EPP catalog	-	Open an internet explorer to see the online EPP catalogue
	About Calys	-	Open a pop up window with information about Calys
	About EPP	-	Open a pop up window with information about connected EPP



2.5.1.2 Navigation

To navigate through the menu, you just click on the title of the menu you want to access:

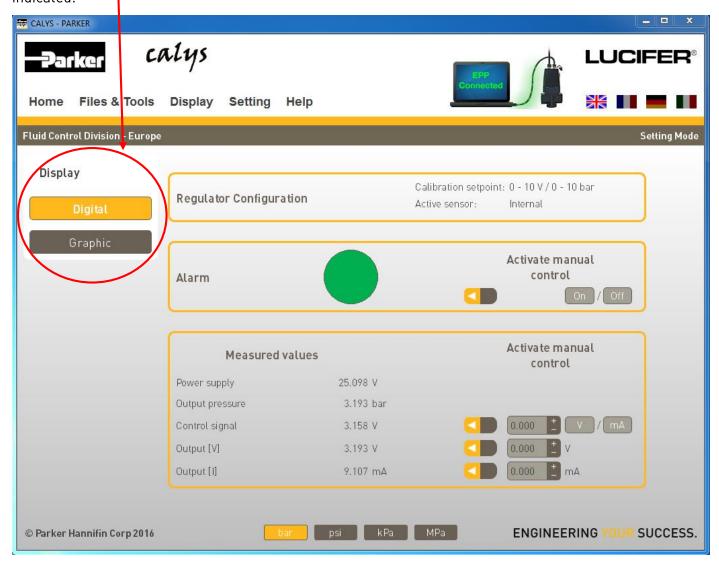
If the menu has no submenu (as Home or Files & Tools), the corresponding page will directly open.

User Manual

• If the menu has submenus, after clicking on menu, a drop down menu will appear with the available submenu, you can then click on the one you want to open.



On the left of the windows, you can see a scope where the menu and the different available submenu is indicated:



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The active submenu is in a yellow color and others in gray. To navigate through the submenu of the selected menu, you can directly click on gray buttons.

2.5.2 EPP connection state

An animated picture, placed on the header of the window, indicates the EPP connection state. There are two possibilities:



EPP is not correctly connected.



EPP is correctly connected and communicates with computer.

2.5.3 Languages

At any time, you can change the software language by clicking on the corresponding flag:



English, French, German, Italian.

The selected flag is highlighted and the others remain gray.

2.5.4 Current software user mode

Three different modes can be selected by users (see paragraph 3 for more details). The choice can be made on the Home page and the current mode is displayed at the right of the headband on the window header:



2.5.5 Pressure unit

At any time, you can change the pressure unit used by the software. You have the choice between 4 units:

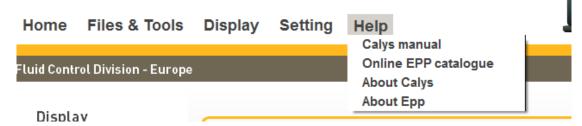


- bar;
- psi \rightarrow 1 bar correspond à 14,5038PSI;
- kPa →1 bar correspond à 100kPa;
- MPa →1 bar correspond à 0.1MPa;



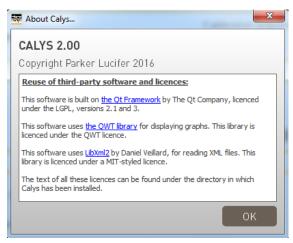
By default, the selected unit is 'bar.' But if you change the unit and then close the software, when you start again, it keeps your choice in memory.

2.6 Help menu



In the Help menu, you can find:

- Calys manual: when you click on it, this document in pdf format will open at the first page. The language of this document will be identical to the software selected language.
- Online EPP catalogue: it is a web link to the EPP range catalogue in the selected language. You have to be connected to the internet to access the link.
- About Calys: by clicking on it, a pop-up window will open to indicate the Calys version and tools used to develop this software. Click on 'OK' to close the window;



About EPP: this choice is only available when the EPP is correctly connected. A pop-up window will
open to indicate the type and the version of the connected EPP. Click on 'OK' to close the window;





3. User Modes

Three different user modes can be chosen from the Home page:

- Reading Mode → default mode
- Setting Mode \rightarrow password needed (available in the notice provided with the EPP4 regulator)
- Factory Mode → password needed (mode reserved for Parker engineers)



3.1 Reading Mode

By selecting the Reading Mode, users have access to the Display screen, with direct viewing of the values currently monitored by the connected EPP4. Values can be displayed as Digital or Graphic.

In this mode, users cannot modify the regulator's settings nor behavior.

3.2 Setting Mode

By selecting the Setting Mode (password protected), users have access to the Display screen already described previously, and he has access to additional capabilities in the Files & Tools screen, and access to the Setting screen.

The Files & Tools screen enables the user to Import from / Export to the regulator of the parameters file, or create a new file.

The Setting screen enables the user to adjust all the regulator's parameters (control signal, alarm, output signals, PID).

We remind you only competent and authorized persons can modify parameters.

Before and during any parameters modification, apply a null control signal.

3.3 Factory Mode

This mode (protected by a password) is reserved for users who have undergone appropriate training.



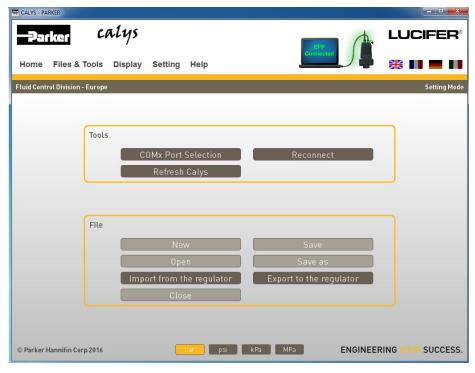
4. Files & Tools Menu

4.1 Reading Mode



In this mode, the user can select the relevant COM port on which the EPP4 is connected (COMx Port Selection), or reconnect to the selected COM port (Reconnect).

4.2 Setting Mode



In this mode, the user has access to additional capabilities:



New → Creates a new parameter fileOpen → Opens an existing parameter file

Import from the regulator \rightarrow Imports current regulator's parameters to a file saved on the PC

Close \rightarrow Closes the opened parameter fileSave \rightarrow Saves the current parameter file

Save as \rightarrow Saves the current parameter file under a new name

Export to the regulator → Exports the opened parameter file into the connected regulator



5. Display Menu

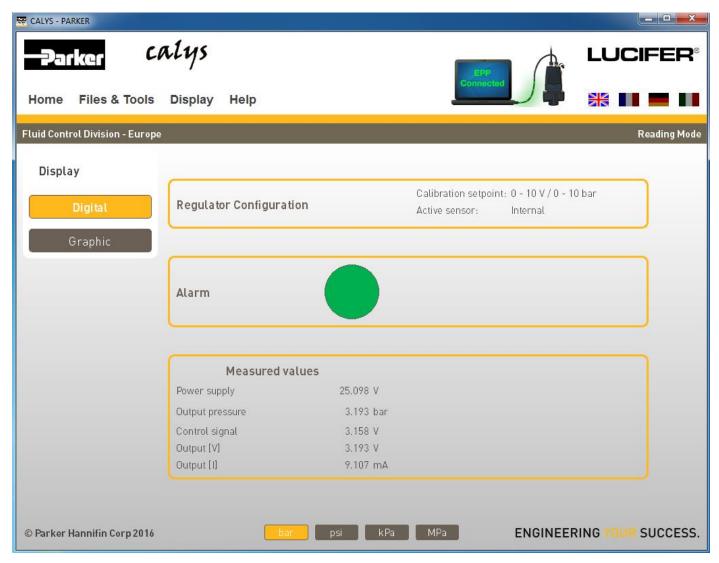
5.1 Digital

On this page, you will find:

- Regulator Configuration: Informs you about the current calibration of the Control signal, the current active sensor, and the current calibration of the external sensor (when available).
- <u>Alarm</u>: You can see the state of the regulator Alarm and you can also control it manually in Setting mode:
- <u>Measured Values</u>: You can read the current digital values of input and output signals of the connected regulator. In Setting mode, you can also control it manually (except for Power supply and Output pressure);

5.1.1 Reading Mode

In this user mode, you can only read the operating values of the connected EPP, you have no access to the manual control.



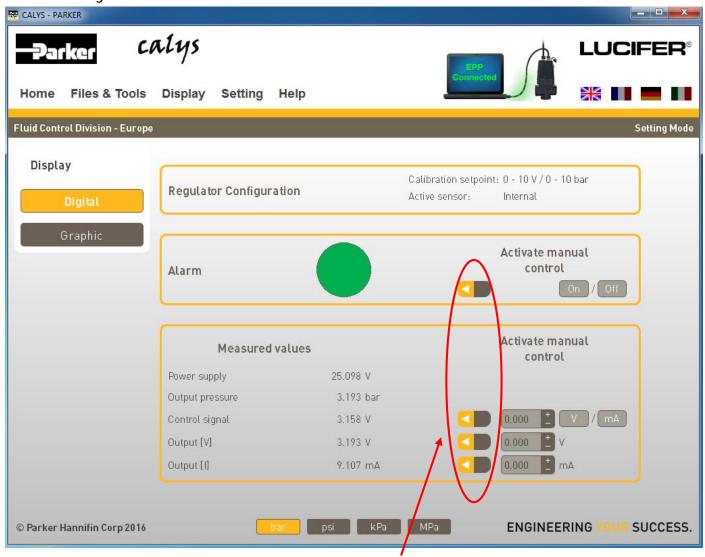
Measured Values:

Power supply: permits checking the regulator supply voltage, indicated in volts;



- Output pressure: permits reading the current output pressure of the internal regulator pressure sensor;
- Control signal: permits reading the current value of the analog input regulator (pin 2 of A connector);
- External sensor: permits reading the current value of the analog input regulator (pin 3 of A connector);
- Output [V]: permits reading the current value of the analog output regulator (pin 5 of A connector);
- Output [1]: permits reading the current value of the analog output regulator (pin 6 of A connector);

5.1.2 Setting Mode



In Setting mode, you can activate the manual control of a signal independently from the others by clicking on the corresponding switch. When activated, buttons on the right will activate too and digital values on the left disappear.



In the Measured Values scopes, you can control 4 signals, 2 inputs, and 2 outputs manually:

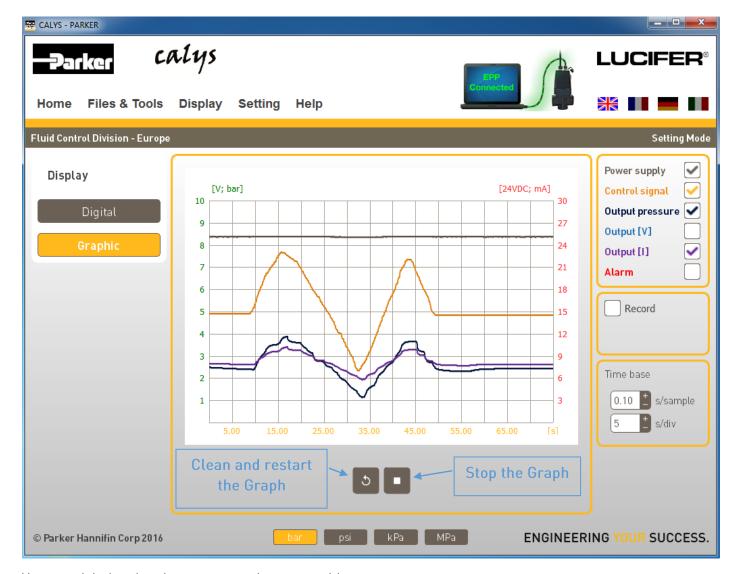
- Input control signal, pin 2 of the A connector (see § 2.4): When activated, the regulator uses the digital value that you write in the spin box instead of the input analog signal;
- Input external sensor, pin 3 of the A connector (see § 2.4): When activated, the regulator uses the digital value that you write in the spin box instead of the input analog signal;
- Output [V], pin 5 of the A connector (see § 2.4): When activated, the regulator sets its corresponding analog output to the digital value that you write in the spin box;
- Output [I], pin 6 of the A connector (see § 2.4): When activated, the regulator sets its corresponding analog output to the digital value that you write in the spin box;



You can control the alarm signal state present on pin 4 of the A connector (see § 2.4). If you select 'On,' you put the output signal in Alarm state (24Vdc or 0V depends on the alarm polarity, see § 6.2) and if you select 'Off,' you put the output signal in Normal state (24Vdc or 0V depends on the alarm polarity, see § 6.2).

5.2 Graphic

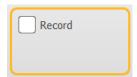
This page permits the user to see and record the regulator operating history.



You can tick the signal you want to observe on this scope:



To record the graph, you have to tick the following scope.



After clicking, a window opens. You can select the directory and the name of the CSV file corresponding to the record.

Then, you will have access to the record control buttons (Play – Pause - Stop):

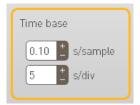




When you click on Play, the recording starts. The Play button becomes yellow until you click on the Pause or Stop button.



The scope Time base is used to modify the graph timing:



- s/sample: Indicates the time interval between each stated value. Default value: 0.1 second
- s/div: Indicates the scale of the time grid. Default value: 5 second per division.

NOTE: pressure scale 0-10 bar is set on the vertical axis on the left of the graph. When the pressure scale is higher than 10 bar (depending on the connected EPP), it will be set on the vertical axis on the right of the graph.

6. Setting Menu

This menu is only available in the Setting Mode. It permits the user to modify parameters of the regulator.

6.1 Control Signal



This menu permits the user to change the setting of the regulator reference signal. It is on the Pin 2 of the M12 A connector (see connector details on paragraph 2.4).

First, you can choose the unit of your corresponding control signal between Voltage and Current. This selection is available in the scope at the top right of the window:



In the same scope, you can read the current analog value of your control signal and see its equivalent value on the output pressure.

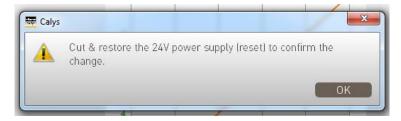
If you want to customize the ratio between Control signal and Output pressure, you can directly modify the value of the 4 spinboxes around the graph. As soon as you have changed the setting of the graphic, the corresponding curve is displayed in real time and the equivalent output pressure value displayed in the top right scope is frozen.

When you have finished modifying the settings, you have to save it by clicking on the blue 'Save' button at the bottom right of the window.





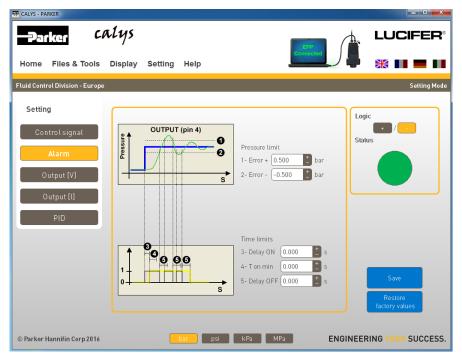
After clicking on the 'Save' button, Calys sends the new parameter values to the regulator memory. While sending, all buttons on the window are in gray. After a few seconds, Calys informs you by a popup to confirm the change you have made by switching Off / On the 24V power of the regulator.



If you want to restore the factory value, you can click on the corresponding button. To confirm the change you also have to switch Off / On the 24V power.

6.2 Alarm

This menu permits the user to configure the setting of the digital output on the pin 4 of the M12 A connector. (See connector details on paragraph 2.4)

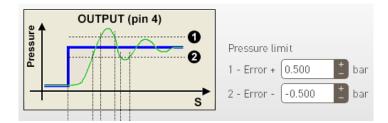


The Alarm is activated by the regulator when the pressure regulation error measured is out of the defined limit.

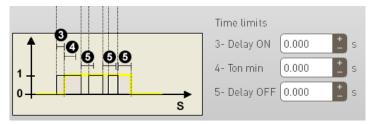
Threshold limit and timing characteristic can be configured on this page. At the center of the window, a picture explains the meaning of each parameter:

• Two parameters define the threshold min. and max. on the measured error:





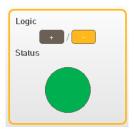
Three parameters are used to define the timing characteristic:



- Delay ON: corresponding to the minimum time before activating the alarm when an error occurrs;
- o Ton min: corresponding to the minimum activation time of the alarm;
- Delay OFF: corresponding to the minimum time before deactivating the alarm when the error disappears;

On the scope at the top right of the window, you can change the logic state of the digital output: Positive or Negative.

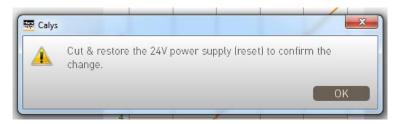
You can also see the state of the alarm with the colored round button: Green is not activated and Red is activated.



When you have finished modifying the Alarm settings, you have to save it by clicking on the blue 'Save' button at the bottom right of the window.

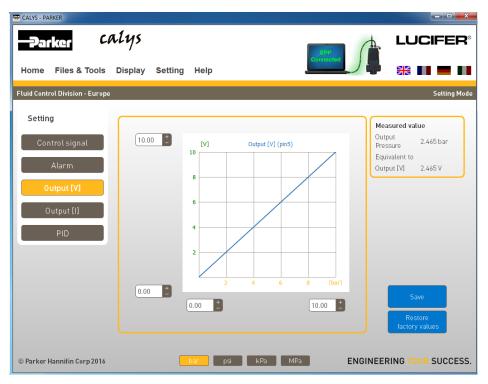


After clicking on the 'Save' button, Calys sends the new parameter values to the regulator memory. While sending, all buttons on the window are in gray. After a few seconds, Calys informs you by a popup to confirm the change you have made by switching Off / On the 24V power of the regulator.



If you want to restore the factory value, you can click on the corresponding button. To confirm the change you also have to switch Off / On the 24V power.

6.3 Output [V]



This menu permits the user to change the setting of the output voltage signal. It is on the Pin 5 of the M12 A connector (see connector details on paragraph 2.4).

In the scope at the top right of the window, you can read the current output pressure measured by the internal pressure sensor and see its equivalent value on the output voltage.



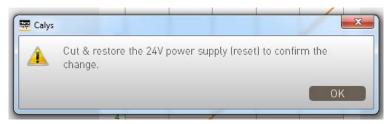
If you want to customize the ratio between output pressure and output voltage, you can directly modify the value of the 4 spinboxes around the graph. As soon as you have changed the setting of the graph, the corresponding curve is displayed in real time and the equivalent output voltage value displayed in the top right scope is frozen.



When you have finished modifying the settings of the output voltage, save it by clicking on the blue 'Save' button at the bottom right of the window.

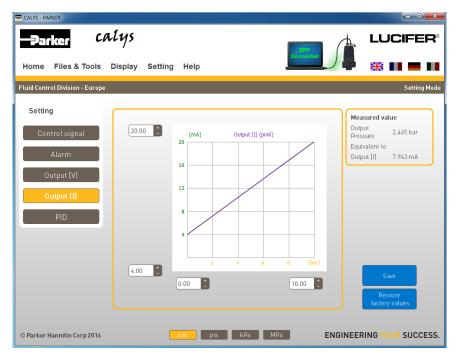


After clicking on the 'Save' button, Calys sends the new parameter values to the regulator memory. While sending, all buttons on the window are in gray. After a few seconds, Calys informs you by a popup to confirm the change you have made by switching Off / On the 24V power of the regulator.



If you want to restore the factory value, you can click on the corresponding button. To confirm the change you also have to switch Off / On the 24V power.

6.4 Output [1]



This menu permits the user to change the setting of the output current signal. It is on the Pin 6 of the M12 A connector (see connector details on paragraph 2.4).

In the scope at the top right of the window, you can read the current output pressure measured by the internal pressure sensor and see its equivalent value on the output current.





If you want to customize the ratio between output pressure and output current, you can directly modify the value of the 4 spinboxes around the graph. As soon as you have changed the setting of the graph, the corresponding curve is displayed in real time and the equivalent output voltage value displayed in the top right scope is frozen.

When you have finished modifying the settings of the output current, save it by clicking on the blue 'Save' button at the bottom right of the window.



After clicking on the 'Save' button, Calys sends the new parameter values to the regulator memory. While sending, all buttons on the window are in gray. After a few seconds, Calys informs you by a popup to confirm the change you have made by switching Off / On the 24V power of the regulator.



If you want to restore the factory value, you can click on the corresponding button. To confirm the change you also have to switch Off / On the 24V power.

6.5 External Sensor

Please note that this page is only available if:

- No EPP communicates with Calys;
- Connected EPP supports this feature;

Otherwise, this page is not accessible.

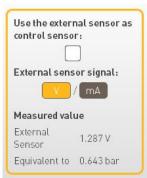




This menu permits the user to configure the settings of the external sensor signal. It is on the Pin 3 of the M12 A connector (see connector details on paragraph 2.4).

In the scope at the top right of the window, you can:

- Select the external sensor as the active sensor for the regulation;
- Select the unit of your corresponding output sensor signal between Voltage and Current;
- See the current analog value provided by external sensor signal connected on Pin 3 and see its equivalent value on pressure;



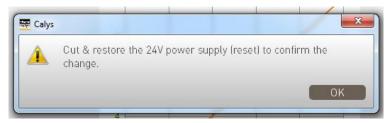
If you want to customize the ratio between External sensor signal and pressure, you can directly modify the value of the 4 spinboxes around the graph. As soon as you have changed the setting of the graph, the corresponding curve is displayed in real time and the equivalent pressure value displayed in the top right scope is frozen.

When you have finished modifying the settings, save it by clicking on the blue button at the bottom right of the window.



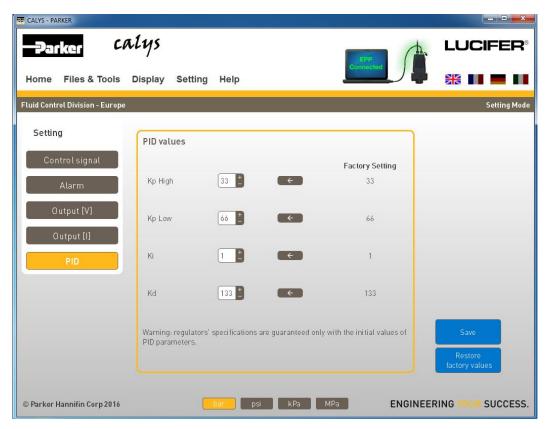


After clicking on the 'Save' button, Calys sends the new parameter values to the regulator memory. While sending, all buttons on the window are in gray. After a few seconds, Calys informs you by a popup to confirm the change you have made by switching Off / On the 24V power of the regulator.



If you want to restore the factory value, you can click on the corresponding button. To confirm the change you also have to switch Off / On the 24V power.

6.6 PID



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

By default, each spinbox is initialized by the current implemented value into the memory of the regulator. You can adjust the values in order to match the required behavior. A higher gain will result in a more reactive behavior 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

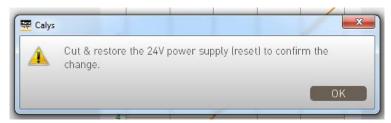


On the right of the window, you can also find the factory value for the connected regulator. So you can set each parameter with its corresponding factory value by clicking on the button:

When you have finished modifying the PID parameters, you have to save it by clicking on the blue button at the bottom right of the window.

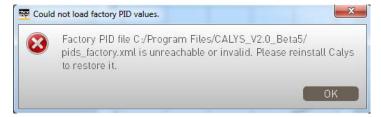


After clicking on the 'Save' button, Calys sends the new parameter values to the regulator memory. While sending, all buttons on the window are in gray. After a few seconds, Calys informs you by a popup to confirm the change you have made by switching Off / On the 24V power of the regulator.

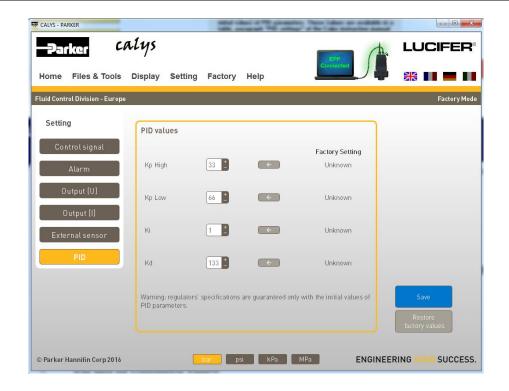


If you want to restore the factory value, you can click on the corresponding button. To confirm the change you also have to switch Off / On the 24V power.

If you see the following window when you go on the PID menu, it means that Calys Software hasn't opened a file correctly. We invite you to uninstall and reinstall the software. If the problem remains, please contact Parker.



Click on OK to close the windows. After that, Calys works well but PID factory value is not displayed and you cannot restore the factory value.







Parker Hannifin Corporation Fluid Control Division - Europe Chemin du Faubourg-de-Cruseilles 16, 1227 Carouge GE, Switzerland Tel: +41 22 307 71 11 www.parker.com/fcde