

# Configuration of CPE 310 transmitters by keypad





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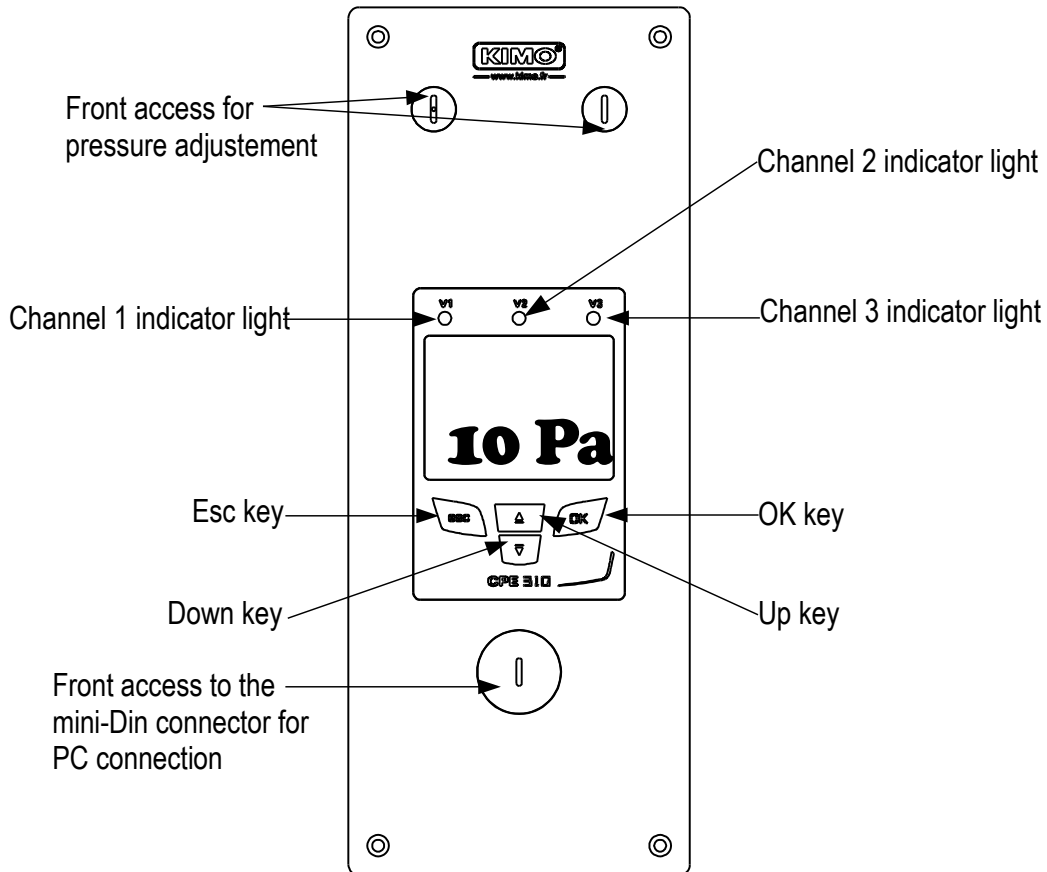
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## 1.1. Description of the transmitter

The CPE310-S can be configured via the keypad. It is possible to set the measurement units, to activate or not a channel,...

**Principle :** the different settings are in the form of folders and sub-folders numbers. The digital codes are fully detailed in this manual.



## 1.2. Description of the keys

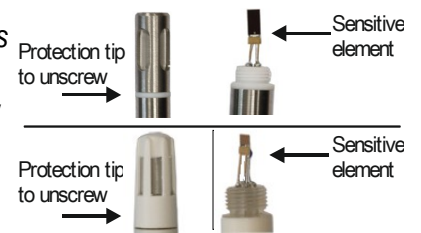
- **Up key** : increments a value or a level
- **Down key** : decrements a value or a level
- **OK key** : validates an input
- **Esc key** : cancels the input or goes back to the previous step

## 1.3. Protection tips of the sensor



*It's extremely unwise to remove the protection tip of our hygrometry probes as the sensitive element is very fragile even to light contacts. However, if you have to remove the protection tip, take all possible precautions and avoid any contact with the sensitive element.*

To remove the protection tip, unscrew it or unclip it.



### 2.1. Configuration of parameters

- **Communication speed** : between 2400 and 115200 bauds, 19200 bauds by default
- **Data bits** : 8 bits
- **Stop bit** : 1 bit
- **Parity** : None
- **Flow control** : None
- **Transmitter addressing** : between 1 and 255 (automatically answers the requests from address 0)
- **Data sending** : made by words of 2 bytes, in the following order : most-significant then least-significant byte

### 2.2. Functions

- **Register function** : Function 03
- **Register writing** : Function 16
- **Communication loop test** : Function 08

### 2.3. Access code to register

- **Registers type:**

Type	Size	Description	Format
U8	1 byte	Unsigned integer 8 bits	Byte 1
Example with a value of <b>24 (0x18)</b>			<b>0x18</b>

Type	Size	Description	Format	
U16	2 bytes	Unsigned integer 16 bits	Byte 2	Byte 1
Example with a value of <b>300 (0x012C)</b>			<b>0x01</b>	<b>0x2C</b>

Type	Size	Description	Format			
U32	4 bytes	Unsigned integer 32 bits	Byte 2	Byte 1	Byte 4	Byte 3
Example with a value of <b>1 096 861 217 (0x4160C621)</b>			<b>0xC6</b>	<b>0x21</b>	<b>0x41</b>	<b>0x60</b>

Type	Size	Description	Format			
Real	4 bytes	Real 32 bits	Byte 2	Byte 1	Byte 4	Byte 3
Example with a value of <b>153.5 (0x43198000)</b>			<b>0x80</b>	<b>0x00</b>	<b>0x43</b>	<b>0x19</b>

Type	Size	Description	Format
Enumeration	1 byte	See Enumeration table page 8	Same as U8
Boolean	1 byte	True = 1 ; False = 0	Same as U8

Type	Size	Description	Example					
Serial number	8 octets	Class (1 byte) Range (1 byte) Year (2 bytes) Month (1 byte) Number (3 bytes)	'3' (0x33) 'F' (0x46) 13 (0x000D) 8 (0x08) 98765 (0x0181CD)					
<b>Format</b>								
Byte 2 (range)	Byte1 (class)	Byte 4 (year)	Byte 3 (year)	Byte 6 (number)	Byte 5 (month)	Byte 8 (number)	Byte 7 (number)	
0x46	0x33	0x00	0x0D	0xCD	0x08	0x01	0x81	
Example with 3F13898765 : 0x0181CD0800D4633								

### Alarms and relays status – Modbus code : 7000

Encoded on 4 octets (U32)

Byte 2	Byte 1				
b8 – b15	b7 – b4	b3	b2	b1	b0
Unused	Unused	Unused	Channel 3	Channel 2	Channel 1
		Alarm state*			

(\*1 : the channel is in alarm state / 0 : the channel is not in alarm state

Byte 4					Byte 3				
b31 – b28	b27	b26	b25	b24	b23 – b20	b19	b18	b17	b16
Unused	Relay 4**	Relay 3**	Relay 2**	Relay 1**	Unused	Unused	Alarm 3***	Alarm 2***	Alarm 1***

(\*\*)1 : the alarm is activated / 0 : the alarm is deactivated

(\*\*\*)1 : the relay is triggered / 0 : the relay is not triggered

- **Values** – Modbus code : 7010 (channel 1)  
7040 (channel 2)  
7070 (channel 3)
- **Number of digits after the decimal point** – Modbus code : 7020 (channel 1)  
7050 (channel 2)  
7080 (channel 3)
- **Unit** – Modbus code : 7030 (channel 1)  
7060 (channel 2)  
7090 (channel 3)

### List of units :

Field	Unit	Value
	None	0
Temperature	°C	16
	°F	17
Hygrometry	%HR	32
	g/Kg	33

	Kj/KG	34
	°C td	35
	°F td	36
	°C Tw	37
	°F Tw	38
<b>Pressure</b>	kPa	50
	inWg	51
	hPa	52
	mbar	53
	mmHg	54
	mmH2O	55
	daPa	56
	Pa	57
<b>Air velocity</b>	m/s	64
	fpm	65
	km/h	66
<b>Combustion</b>	ppm	112

“Enumerations” table :

Corresponding values		0	1	2	3	4	5	6	7
<b>Modbus</b>	<b>Com speed</b>	2400	4800	9600	19200	38400	115200	Unused	
<b>Channel x</b>	<b>Unit</b>	See list of unit							
<b>Channel x</b>	<b>Transmitter</b>	none	probe 1	probe 2	module	Unused			
<b>Output x</b>	<b>Type</b>	4 - 20 mA	0 - 20 mA	0 - 10 V	0 - 5 V	0 - 1 V	Unused		
<b>Output x</b>	<b>Diagnostic</b>	Deactivate	0%	50%	100%	Unused			
<b>Alarm x</b>	<b>Mode</b>	Deactivate	Rising edge	Falling edge	Monitoring	Transmitter state	Unused		
<b>Alarm x</b>	<b>Security</b>	Negative	Positive	Unused					
<b>Relay x</b>	<b>Selection</b>	OFF	ON	Alarm 1	Alarm 2	Alarm 3	Unused		



### 3. Access to the different functions



**This step is compulsory for each configuration.**

First, to access to the transmitter functions, and for safety, a safety code must be entered. The default safety code is **0101**.

- The transmitter must be energized.
  
- Connect the transmitter.
- Wait until the initializing period is over.
- Press **OK**.  
*“Code” is displayed with “0000”. The 1<sup>st</sup> 0 blinks.*
- Press OK to go to the 2<sup>nd</sup> 0.  
*It blinks.*
- Press Up key to display 1 then press OK.  
*The 3<sup>rd</sup> 0 blinks.*
- Press OK to go to the 4<sup>th</sup> 0.
- Press Up key to display 1 then press OK.  
*The following screen is displayed :*

<b>Code</b> <b>0101</b>
----------------------------

<b>F 100</b>
--------------

“**F 100**” is for the number of the configuration folder. There are 5 folders :

- **F 100** : folder of the transmitter configuration. See page 10.
- **F 200** : folder of the channels and measurement units. See page 13.
- **F 300** : folder of the analogue outputs. See page 14.
- **F 400** : folder of the alarms. See page 17.
- **F 500** : folder of the channels, integration and autozero configuration. See page 19.

To select the required folder :

- *“F 100” is displayed and 1 is blinking.*
- Press Up key until the number of the required folder is displayed (F 100, F 200, F 300 or F 500).
- Press OK.

## 4. F 100 : Configure the transmitter

This folder allows to configure the following parameters of the transmitter : safety code, modbus, options and factory configuration.

It also indicates the serial number and the firmware version of the transmitter.

### 4.1. Access to the serial number : F100

The serial number allows to get activation codes for the options.

*F 100 is displayed (see previous page).*

- Press OK.  
*“F 100” is displayed with the serial number of the transmitter that scrolls below.*

### 4.2. Access to the firmware version : F101

*F100 folder is displayed.*

- Press Up key.  
*“F 101” is displayed with the version number that scrolls below (e.g : 1.00)*

### 4.3. Lock the keypad : F 140

For more safety and to avoid any handling mistake, it is possible to lock the keys.

*F101 sub-folder is displayed.*

- Press Up key.  
*“F 140” is displayed with “0” indicating that the locking is on.*
- Press OK.  
*“0” blinks.*
- Press Up or Down key, “1” blinks, then press OK.  
*“LOCK” is displayed for a few seconds then the transmitter backs to the displaying of measured values.  
All the keys are inactive.  
To activate them again :*
- Press OK for 10 seconds.  
*“LOCK” is displayed for a few seconds then the transmitter goes back to the displaying of measured values and keys are active again.*

### 4.4. Modify the safety code : F141

It is possible to modify the safety code.

*F140 sub-folder is displayed.*

- Press Up key.  
*“F 141” is displayed with the safety code below.*
- Press OK.  
*The 1<sup>st</sup> zero blinks.*
- Press Up or Down key to modify the digit then press OK.  
*The 2<sup>nd</sup> digit blinks.*
- Press Up or Down key to modify the digit then press OK.  
*The 3<sup>rd</sup> digit blinks.*
- Press Up or Down key to modify the digit then press OK.  
*The 4<sup>th</sup> digit blinks.*
- Press Up or Down key to modify the digit then press OK.  
*“OK”» is displayed.*
- Press OK to validate the modification of the code or Esc to cancel.  
*The transmitter goes back to the displaying of the F141 folder with the new code indicated below.*

## 4.5. Configure the Modbus communication (optional)



Modbus option must be activated (see chapter 4.6).

### 4.5.1 Set the slave number : F150

*F141 sub-folder is displayed.*

- Press Up key.  
*“F 150” is displayed.*
- Press OK.  
*“F150” blinks with the serial number below (e.g : 255).*
- Press OK.  
*The 1<sup>st</sup> digit of the slave number blinks.*
- Press Up and Down keys to modify it then press OK.  
*The 2<sup>nd</sup> digit of the slave number blinks.*
- Press Up and Down keys to modify it then press OK.  
*The 3<sup>rd</sup> digit of the slave number blinks.*
- Press Up and Down keys to modify it then press OK.  
*“F150” blinks with the selected slave number below.*

### 4.5.2 Set the speed communication : F151

- Press Up or Down key to go to F151 sub-folder.  
*Speed communication in bits per second is displayed (e.g : 9600).*
- Press OK.  
*The speed communication blinks.*
- Press Up and Down keys to select the required speed communication between the following values :
  - 2400 bds
  - 4800 bds
  - 9600 bds
  - 19.2 Kbds
  - 38.4 Kbds
  - 115.2 Kbds
- Press OK.  
*“F151” blinks with the selected speed communication below.*

## 4.6. Activate the options



To activate an option, an activation code is necessary. This code is provided by the manufacturer. Available options for CPE310 are the high resolution in pressure (F170 sub-folder) and Modbus (F171 sub-folder).

### - High resolution in pressure option : F170

*“F150” sub-folder is displayed.*

- Press Up key.  
*“F170” blinks and “0” is displayed below, meaning the option is not activated.*
- Press OK.  
*“0” blinks.*
- Press Up key.  
*The transmitter asks for an activation code.*
- Enter the activation code (same procedure as for the safety code) then press OK.  
*“F170” blinks and “1” is displayed below, meaning the option is activated.*

**- Modbus option : F171**

- Go to the F171 sub-folder and perform the same procedure as for high resolution option.

**4.7. Back to factory settings : F190**

*“F170” sub-folder is displayed.*

- Press Up key.  
*“F190” blinks and “RAZ” is displayed below.*
- Press OK.  
*“K?” is displayed below “F190”.*
- Press OK to confirm the factory settings or Esc to cancel.



**All the performed configurations will be erased.**

## 5. F 200 : Configuration of the channels and measurement units

This folder allows to activate the channels and to set measurement unit for each channel.

### 5.1. Activate a channel

*The transmitter is powered on.*

- Press OK.
- Enter the activation code (see page 9).
- Press OK.
- Press Up key to go to F200 folder.
- Press twice OK.  
*“SDE” is displayed below “F200”.*
- Press OK.  
*“SDE” for probe or “OFF” for deactivated channel or “PRES” for pressure blinks.*
- Press Up and Down key to select :
  - « **SDE** » : channel is activated with a measurement probe
  - « **PRES** » : channel is activated with a pressure board
  - « **OFF** » : channel is deactivated
- Press OK.  
*The last zero of F200 blinks.*

“F200” folder allows to activate the channel 1 of the transmitter.

To activate channels 2 and 3 go to the following folders :


- F210 for channel 2
- F220 for channel 3
- Perform the same procedure as for the channel 1.

### 5.2. Assign a measurement unit to a channel

*The transmitter is powered on and a channel is activated.*

*“F200” folder is displayed.*

- Press Up key.  
*“F201” sub-folder is displayed with the unit corresponding to the channel 1 below.*
- Press OK.  
*The unit blinks.*
- Press Up and Down keys to select the required unit.
- Press OK.

 “---” sign means that the channel is deactivated.

“F201” sub-folder allows to select the unit for the channel 1.

To select the unit for channels 2 and 3, go to the following folders :

- F211 for channel 2
- F221 for channel 3
- Perform the same procedure as for the unit selection for the channel 1.

## 6. F 300 : Manage the analogue outputs

### 6.1. Set the analogue outputs

*The transmitter is powered on.*

- Press OK.
- Enter the activation code (see page 9).
- Press OK.
- Press Up key to go to F 300 folder corresponding to the analogue output of the channel 1 then press twice OK.  
*“F300is displayed with the analogue output below.*
- Press OK.  
*The analogue output blinks.*
- Press Up or Down key to select the required output signal :
  - 4-20 mA
  - 0-20 mA
  - 0-10 V
  - 0-5 V
- Press OK.

 “F300” folder is for the analogue output of the channel 1.

- For the channels 2 and 3, go to the following folders :
- F310 for the channel 2
  - F320 for the channel 3
- Perform the same procedure as for the channel 1.

### 6.2. Set the ranges of the analogue outputs

This function allows to modify the ranges of the analogue outputs.



**Values to enter depend on the unit of measurement and not on the measurement range of the transmitter.**

Ex : on a CPE310 pressure transmitter (0 to  $\pm 100$  Pa) with a reading in mmH<sub>2</sub>O, the minimum and maximum ranges must be configured on a measuring range from 0 to  $\pm 10$  mmH<sub>2</sub>O. See conversion chart page 16.

*The transmitter is powered on.*

- Press OK.
- Enter the activation code (see page 9).
- Press OK.
- Press Up key to go to F301 folder corresponding to the minimum range of the channel 1.
- Press OK.  
*The 1<sup>st</sup> digit of the minimum range blinks.*
- Enter with Up and Down keys the figure value or the negative sign of the value then press OK.  
*The 2<sup>nd</sup> digit blinks.*
- Enter with Up and Down keys its value then press OK.
- Perform the same procedure for the following figures.
- Press OK when the last figure is configured.  
*F 301 blinks, the minimum range is configured.*
  
- Press Up key then press OK to enter in the folder F 302 corresponding to the high range of the channel 1.  
*The 1<sup>st</sup> digit of the high range blinks.*
- Enter with Up and Down keys the figure value or the negative sign of the value then press OK.  
*The 2<sup>nd</sup> digit blinks.*

- Enter with Up and Down keys its value then press OK.
- Perform the same procedure for the following figures.
- Press OK when the last figure is configured.  
*F 302 blinks, the high range is configured.*



To set the low and high ranges of the channel 2, go to the folder F311 (low range) and F 312 (high range) and follow the setting procedure of the channel 1.

To set the low and high ranges of the channel 3, go to the folder F 321 (low range) and F 322 (high range) and follow the setting procedure of the channel 1.

### 6.3. Output diagnostic

This function allows to check on a measurement device (multimeter, regulator or automate) the proper functioning of the outputs. The transmitter will generate a voltage (between 0 and 10 V) or a current (between 0 and 20 mA) according to the setting of the type of output.

- For a 0-10 V output signal, the transmitter will generate 0 – 5 or 10 V.
- For a 0-5 V output signal, the transmitter will generate 0 – 2.5 or 5 V.
- For a 4-20 mA output signal, the transmitter will generate 4 – 12 or 20 mA.

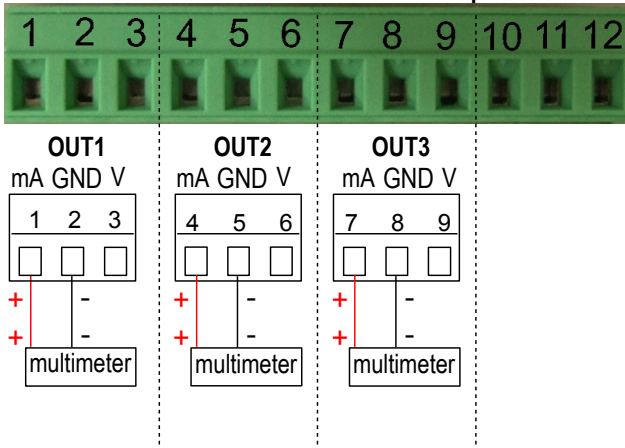
#### 6.3.1 Connection configuration

Before carrying out the output diagnostics, all connections and configurations of the transmitter must be enabled, to avoid any damage on the transmitter and the multimeter !

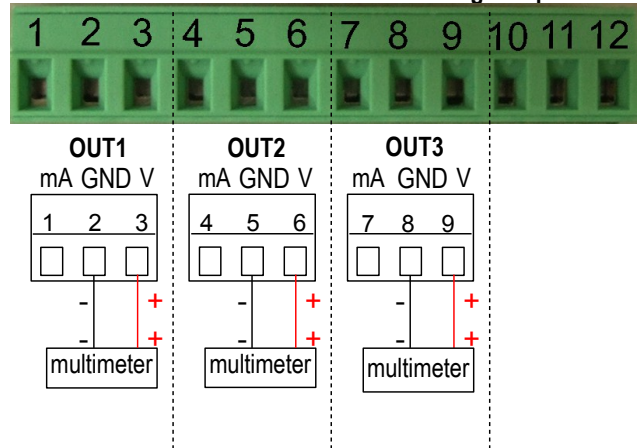
- Select an output for the output diagnostic.  
*OUT1, OUT2 or OUT3 indicated on the connection label.*
- Connect a measurement device on the channel 1, 2 or 3.



Connection of the 0/4-20 mA current output :



Connection of the 0/4-20 mA voltage output :



### 6.3.2 Perform the output diagnostic

Once the connection to the measurement device is performed, you can carry out the analogue output diagnostics on several check points.

*The transmitter is powered on.*

- Press OK.
- Enter the activation code (see page 9).
- Press OK.
- Press Up key to go to F303 folder.
- Press OK.
- F 303 blinks, corresponding to the folder of the **channel 1 diagnostic**.*
- Press OK.
- Press Up and Down keys to select the signal the transmitter must generate.

Display	Generated output	Example
1/3	Simulates 0 % of the output range	On the range 0-10V, the transmitter will generate 0 V.
2/3	Simulates 50 % of the output range	On the range 0-10V, the transmitter will generate 5 V.
3/3	Simulates 100 % of the output range	On the range 0-10V, the transmitter will generate 10 V.



**If the deviations are too large (>0,05V or >0,05mA) between the signal issued and the value displayed on the multimeter, we recommend that you return the transmitter to our factory.**



For the diagnostic of the **channel 2**, go to **F 313** folder and perform the same procedure as for the channel 1.  
For the diagnostic of the **channel 3**, go to **F 323** folder and perform the same procedure as for the channel 1.

Measurement conversion charts :

#### • Pressure

Pa	mmH <sub>2</sub> O	InWG	mbar	mmHG	kPa	daPa	hPa
±100	±10.2	±0.40	±1.00	±0.75	±0.100	±10.0	±1.00
±1000	±102.0	±4.01	±10.00	±7.50	±1.000	±100.0	±10.00

#### • Temperature

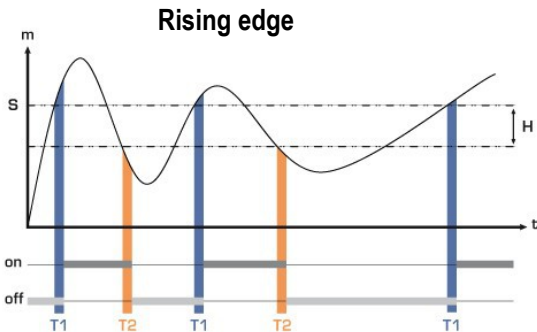
°C	°F
From 0.0 to +50.0	From +32.0 to +122.0
From -20.0 to +80.0	From -4.0 to +176.0
From -40.0 to +180.0	From -40.0 to +356.0
From -100.0 to +400.0	From -148.0 to +752.0



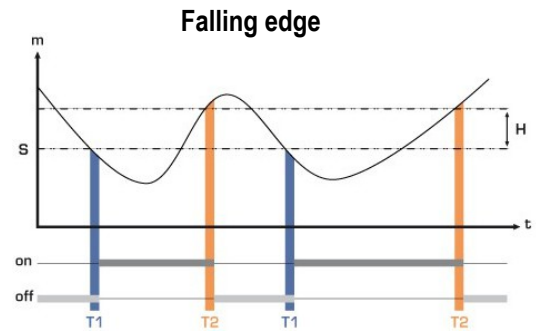
## 7. F400 : Manage the alarms

Three alarm modes are available :

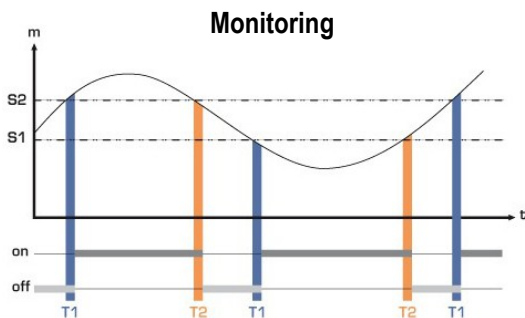
- **Rising edge (1 threshold)** : the alarm goes off when the measurement **exceeds** the threshold and stops when it is **below** the threshold
- **Falling edge (1 threshold)** : the alarm goes off when the measurement is **below** the threshold and stops when it **exceeds** the threshold.
- **Monitoring (2 thresholds)** : the alarm goes off when the measurement is outside the defined low and high thresholds.



Measurement (m) > Threshold (S) during the time-delay T1 → Alarm activation  
 Measurement (m) < Threshold (S) - Hysteresis (H) during the time-delay T2 → Alarm deactivation



Measurement (m) < Threshold (S) during time-delay T1 → Alarm activation.  
 Measurement (m) > Threshold (S) + Hysteresis (H) during time-delay T2 → Alarm deactivation



The alarm goes off when the measurement is outside the low and high thresholds.

When an alarm goes off, it is possible to acknowledge it pressing OK key on the transmitter : the audible alarm, if it is activated, turns off and the displayed value blinks during the acknowledgement duration (from 0 to 60 minutes). At the end of the acknowledgement duration, if the transmitter is still in alarm state, the audible alarm is reactivated.



It is possible to set 3 different alarms :

- **F400** folder corresponds to the **alarm 1** setting
- **F410** folder corresponds to the **alarm 2** setting
- **F420** folder corresponds to the **alarm 3** setting

The alarm setting procedure explained below corresponds to the alarm 1 setting. For the alarms 2 and 3 settings, go to the corresponding folder and perform the same procedure as for the alarm 1.

*The transmitter is powered on.*

- Press OK.
- Enter the activation code (see page 9).
- Press OK.
- Press Up key to go to F 400 folder then press twice OK.  
*This folder is about the alarm mode.*
- Press Up or Down key to select the required alarm mode :

- **OFF** : alarm is deactivated
  - **1/3** : rising edge mode
  - **2/3** : falling edge mode
  - **3/3** : monitoring mode
- Press OK.  
**"F400"** blinks.
- Press Up key to go to the F401 folder of the alarm 1 (F411 for alarm 2 and F421 for alarm 3) then press OK.
- Press Up or Down key then select the channel where the alarm will be activated.
- Press OK.  
**"F401"** blinks.
- Press Up key to go to F402 folder (F412 for alarm 2 and F422 for alarm 3) then press OK.  
*This folder is about the **threshold 1** setting.*
- Set the threshold 1 with Up and Down keys.
- Press OK when the last digit is set.  
**"F402"** blinks.
- Press Up key to go F403 folder (F413 for alarm 2 and F423 for alarm 3) then press OK.  
*This folder is about :*
- For a rising or falling edge : **hysteresis setting**
  - For a monitoring : **threshold 2 setting**.
- Set the hysteresis or the threshold 2 with Up and Down keys.
- Press OK when the last digit has been set.  
**"F403"** blinks.
- Press Up key to go to F404 folder (F414 for alarm 2 and F424 for alarm 3) then press OK.  
*This folder is about the **delay time 1** setting.*
- Set the delay time 1 with Up and Down keys.
- Press OK when the last digit has been set.  
**"F404"** blinks.
- Press Up key to go to F405 folder (F415 for alarm 2 and F425 for alarm 3) then press OK..  
*This folder is about the **delay time 2** setting.*
- Set the delay time 2 with Up and Down keys.
- Press OK when the last digit has been set.  
**"F405"** blinks.
- Press Up key to go to F406 folder (F416 for alarm 2 and F426 for alarm 3) then press OK..  
*This folder allows to activate or not the **audible alarm**.*
- Set the activation of the audible alarm with Up and Down keys :
- **1** : audible alarm is activated
  - **2** : audible alarm is deactivated
- Press OK to validate the alarm..  
**"F406"** blinks.
- Press Up key to go to the F407 folder (F417 for alarm 2 and F427 for alarm 3) then press OK.  
*This folder is about the **acknowledgement of the alarm**.*
- Set the acknowledgement duration of the alarm with Up and Down keys.
- Press OK when the last digit has been set.

## 8. F 500 : Set the pressure measurement

This part allows to set an integration coefficient, to perform an autozero, to set a delay time between two autozeros. In order to compensate a possible drift of the sensor, it is possible to add an offset and/or a coefficient to the value displayed by the transmitter.

### 8.1. Perform an autozero

CPE310 transmitters have a manual autozero which guarantees a good reliability of the measurement in high and low ranges.

The autozero compensates for any long-term drifts of the sensitive element, with the manual adjusting of the zero.

To perform a self-calibration :

- Press Esc during 8 seconds.  
*“AutoZ” is displayed briefly meaning the autozero has been well performed.*

### 8.2. Integration of the pressure measurement

The pressure measurement element is very sensitive and reacts to pressure changes. When making measurements in unstable air movement conditions, the pressure measurement may fluctuate. The integration coefficient (from 0 to 9) makes an average of the measurements ; this helps to avoid any excessive variations and guarantees a stable measurement.

**New displayed value** =  $[(10 - \text{Coef.}) \times \text{New Value}] + (\text{Coef.} \times \text{Old value}) / 10$

Example : CPE310-S (0-1000 Pa) – Current measurement : 120 Pa – New measurement : 125 Pa

The pressure source being stable, the user selects a low integration. Integration : 1, maximum admitted variation  $\pm 10$  Pa.

The variation is lower than 10 Pa, it is possible to apply the integration calculation formula.

**Next displayed value** :  $((9 * 125) + (1 * 120)) / 10 = 124.5$  i.e, 124 Pa. If the new measurement had been de 131 Pa, the next displayed value would have been 100% of the new value i.e, 131 Pa.

*The transmitter is powered on.*

- Press OK.
- Enter the activation code (see page 9).
- Press OK.
- Press Up key to go to F500 folder.
- Press OK.
- Set the integration value with Up and Down keys.

*This value is between 0 and 9 with :*

- **Coefficient 0** : no integration, important fluctuation of the displayed value
- **Coefficient 9** : maximum integration, more stable measurement display.

### 8.3. Delay times between 2 autozeros

It is possible to set an interval between two self-calibrations.

*The transmitter is powered on.*

- Press OK.
- Enter the activation code (see page 9).
- Press OK.
- Press Up key to go to F500 folder.
- Press OK.
- Press Up key to go to F510 folder.
- Press OK.
- The duration between 2 self-calibrations is displayed.*
- Set the duration with Up and Down keys.  
*This delay time must be between OFF (no self-calibration) and 60 minutes.*
- Press OK to validate the duration.


## 8.4. Add a coefficient

The correction coefficient allows to adjust the transmitter according to data in pressure of the installation.

**How to calculate it ?** For example, the pressure in your section is **20 Pa** and the transmitter displays **18 Pa**. The coefficient to apply is **20 / 18**, it means **1.111**.

*The transmitter is powered on.*

- Press OK.
- Enter the activation code (see page 9).
- Press OK.
- Press Up key to go to F500 folder.
- Press OK.
- Press Up key to go to F520 folder then press OK.  
*“F 520” blinks corresponding to the folder of the gain setting for the channel 1.*
- Press OK.  
*The 1<sup>st</sup> digit of the gain blinks.*
- Enter with Up and Down keys the figure value or the negative sign of the value then press OK.  
*The 2<sup>nd</sup> digit blinks.*
- Enter with Up and Down keys its value then press OK.
- Perform the same procedure for the following figures.
- Press OK when the last digit has been set.  
*F 520 blinks, the coefficient for the channel 1 is set.*


-  To add a gain to the **channel 2**, go to **F 530** folder and perform the same procedure as for the channel 1.
- To add a gain to the **channel 3**, go to **F 540** folder and perform the same procedure as for the channel 1.

## 8.5. Add an offset

In order to compensate any possible drift of the sensor, it is possible to add an offset to the value displayed by the transmitter entering a digital value via the keypad.

*The transmitter is powered on.*

- Press OK.
- Enter the activation code (see page 9).
- Press OK.
- Press Up key to go to F500 folder.
- Press OK.
- Press Up key to go to F 521 folder then press OK.  
*“F 521” blinks, corresponding to the folder of the offset setting for the channel 1.*
- Press OK.  
*The 1<sup>st</sup> digit of the offset blinks.*
- Enter with Up and Down keys the figure value or the negative sign of the value then press OK.  
*The 2<sup>nd</sup> digit blinks.*
- Enter with Up and Down keys its value then press OK.
- Perform the same procedure for the following figures.
- Press OK when the last digit has been set.  
*F 521 blinks, the offset for the channel 1 is set.*

-  To add an offset to the **channel 2**, go to **F 531** folder and perform the same procedure as for the channel 1.
- To add an offset to the **channel 3**, go to **F 541** folder and perform the same procedure as for the channel 1.

## 9. Functions recap and Modbus connections

### 9.1. F 100 : configure the transmitter

Code	Register type	Modbus	Description	Possibilities
F 100	Real	1000	Serial number of the transmitter	
F 101	-	1010	Firmware version	
-	U32	1020	Transmitter ID	
-	U32	1030	Probe ID	
F 135	Boolean	1350	Sound	
F 140	Boolean	1400	Keypad locking	0 : deactivated 1 : activated
F 141	U16	1410	Safety code	
F 150	U8	1500	Modbus slave number	From 1 to 255
F 151	Enumeration	1510	Modbus communication speed	2400 / 4800 / 9600 / 19200 / 38400 / 115200 bds
F 170	U32	1700	Activation of the high resolution in pressure option	0 : deactivated 1 : activated
F 171	U32	1710	Activation of the Modbus option	0 : deactivated 1 : activated
F 190	Boolean	1900	Back to factory configuration	

### 9.2. F 200 : configure the channels and the measurement units

Code	Register type	Modbus	Description	Possibilities
F 200	Enumeration	2010	Selection of probe or board	Probe / board / deactivated
F 201	Enumeration	2000	Unit selection of the channel 1	According to probe and board
F 210	Enumeration	2110	Selection of probe or board	Probe / board / deactivated
F 211	Enumeration	2100	Unit selection of the channel 2	According to probe and board
F 220	Enumeration	2210	Selection of probe or board	Probe / board / deactivated
F 221	Enumeration	2200	Unit selection of the channel 3	According to probe and board

### 9.3. F 300 : manage the analogue outputs

Code	Register type	Modbus	Description	Possibilities
F 300	Enumeration	3000	Analogue output of the channel 1	4-20 mA / 0-20 mA / 0-10 V / 0-5 V
F 310	Enumeration	3100	Analogue output of the channel 2	4-20 mA / 0-20 mA / 0-10 V / 0-5 V
F 320	Enumeration	3200	Analogue output of the channel 3	4-20 mA / 0-20 mA / 0-10 V / 0-5 V
F 301	Real	3010	Low range of the channel 1	From -1999 to 9999
F 302	Real	3020	High range of the channel 1	From -1999 to 9999
F 311	Real	3110	Low range of the channel 2	From -1999 to 9999
F 312	Real	3120	High range of the channel 2	From -1999 to 9999

Code	Register type	Modbus	Description	Possibilities
F 321	Real	3210	Low range of the channel 3	From -1999 to 9999
F 322	Real	3220	High range of the channel 3	From -1999 to 9999
F 303	Enumeration	3010	Channel 1 diagnostic : generation of a voltage or a current	Generation according to the output signal
				<b>0-10 V</b> <b>0-5 V</b> <b>0-20 mA</b> <b>4-20 mA</b>
				0 V   0 V   0 mA   4 mA
				5 V   2.5 V   10 mA   12 mA
10 V   5 V   20 mA   20 mA				
F 313	Enumeration	3110	Channel 2 diagnostic : generation of a voltage or a current	Generation according to the output signal
				<b>0-10 V</b> <b>0-5 V</b> <b>0-20 mA</b> <b>4-20 mA</b>
				0 V   0 V   0 mA   4 mA
				5 V   2.5 V   10 mA   12 mA
10 V   5 V   20 mA   20 mA				
F 323	Enumeration	3210	Channel 3 diagnostic : generation of a voltage or a current	Generation according to the output signal
				<b>0-10 V</b> <b>0-5 V</b> <b>0-20 mA</b> <b>4-20 mA</b>
				0 V   0 V   0 mA   4 mA
				5 V   2.5 V   10 mA   12 mA
10 V   5 V   20 mA   20 mA				

#### 9.4. F 400 : manage the alarms

Code	Register type	Modbus	Description	Possibilities
F 400	Enumeration	4000	Alarm mode of the alarm 1	1 : None 2 : Rising edge 3 : Falling edge 4 : Monitoring
F 401	U8	4010	Channel selection alarm 1	Channel 1 Channel 2 Channel 3
F 402	Real	4020	Threshold 1 setting of the alarm 1	According to the connected probe
F 403	Real	4030	Threshold 2 setting or hysteresis of the alarm 1	According to the connected probe
F 404	U16	4040	Delay-time 1 setting of the alarm 1	From 0 to 600 s
F 405	U16	4050	Delay-time 2 setting of the alarm 1	From 0 to 600 s
F 406	Boolean	4080	Audible alarm 1	1 : activated / 0 : deactivated
F 407	U8	4070	Alarm 1 acknowledgement duration	From 0 to 60 minutes

F 410	Enumeration	4100	Alarm mode of the alarm 2	1 : None 2 : Rising edge 3 : Falling edge 4 : Monitoring
F 411	U8	4110	Channel selection alarm 2	Channel 1 Channel 2 Channel 3
F 412	Real	4120	Threshold 1 setting of the alarm 2	According to the connected probe
F 413	Real	4130	Threshold 2 setting or hysteresis of the alarm 2	According to the connected probe
F 414	U16	4140	Delay-time 1 setting of the alarm 2	From 0 to 600 s
F 415	U16	4150	Delay-time 2 setting of the alarm 2	From 0 to 600 s
F 416	Boolean	4180	Audible alarm 2	1 : activated / 0 : deactivated
F 417	U8	4070	Alarm 2 acknowledgement duration	From 0 to 60 minutes
F 420	Enumeration	4200	Alarm mode of the alarm 3	1 : None 2 : Rising edge 3 : Falling edge 4 : Monitoring
F 421	U8	4210	Channel selection alarm 3	Channel 1 Channel 2 Channel 3
F 422	Real	4220	Threshold 1 setting of the alarm 3	According to the connected probe
F 423	Real	4230	Threshold 2 setting or hysteresis of the alarm 3	According to the connected probe
F 424	U16	4240	Delay-time 1 setting of the alarm 3	From 0 to 600 s
F 425	U16	4250	Delay-time 2 setting of the alarm 3	From 0 to 600 s
F 426	Boolean	4280	Audible Alarm 3	1 : activated / 0 : deactivated
F 427	U8	4070	Alarm 3 acknowledgement duration	From 0 to 60 minutes

### 9.5. *F 500 : set the measurement*

Code	Register type	Modbus	Description	Possibilities
F 500	U8	5000	Integration of the measurement in pressure (board)	From 0 to 9
F 501	U8	5010	Integration of the measurement in air velocity (probe)	From 0 to 9
F 502	U8	5020	Integration of the measurement in pressure (probe)	From 0 to 9
F 510	U8	5100	Delay-time between 2 autozeros	From 0 to 60 min

F 511	Boolean	5110	Instantaneous autozero	
F 520	Real	5200	Channel 1 coefficient	From 0.01 to 5
F 530	Real	5300	Channel 2 coefficient	From 0.01 to 5
F 540	Real	5400	Channel 3 coefficient	From 0.01 to 5
F 521	Real	5210	Channel 1 offset	According to probe
F 531	Real	5310	Channel 2 offset	According to probe
F 541	Real	5410	Channel 3 offset	According to probe









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