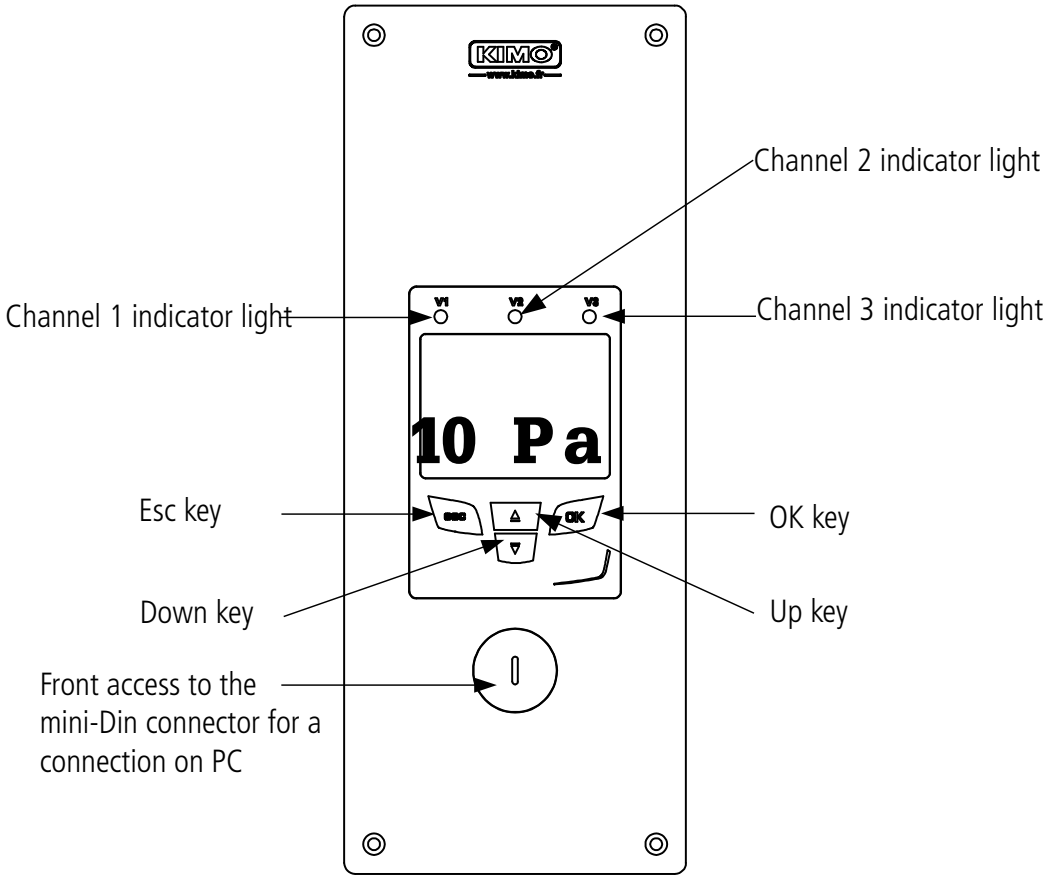
ATE 310 transmitters configuration by keypad

Table of contents

1.1. Transmitter description

The ATE310 transmitter can be configured with the keyboard. It is possible to set the measurement units, to activate or not a channel,…

Philosophy : the different settings are indicated under a folder and sub folder number form. These digital codes are explained in details in the user manual.



1.2. Keys description

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

2.1. Settings

- **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 (always answers to requests from address 0)
- **Data sending :** carried out by words of 2 bytes, in the following order : high weight then low weight

2.2. Functions

- **Registers reading :** Function 03
- **Registers writing :** Function 16
- **Communication loop test :** Function 08

2.3. Access code to register

- Registers type

Type	Size	Designation	Format
U8	1 byte	Unsigned integer 8 bits	Byte 1
Example with a **24 (0x18)** value			**0x18**

Type	Size	Designation	Format	
U16	2 bytes	Unsigned integer 16 bits	Byte 2	Byte 1
Example with a **300 (0x012C)** value			**0x01**	**0x2C**

Type	Size	Designation	Format			
U32	4 bytes	Unsigned integer 32 bits	Byte 2	Byte 1	Byte 4	Byte 3
Example with a **1 096 861 217 (0x4160C621)** value			**0xC6**	**0x21**	**0x41**	**0x60**

Type	Size	Designation	Format			
Real	4 bytes	Real 32 bits	Byte 2	Byte 1	Byte 4	Byte 3
Example with a **153.5 (0x43198000)** value			**0x80**	**0x00**	**0x43**	**0x19**

Type	Size	Designation	Format
Enumeration	1 byte	See the Enumeration table page 8	Idem U8
Boolean	1 byte	True = 1 ; False = 0	Idem U8

Type	Size	Designation	Example
Serial number	8 bytes	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)

Format							
Byte 2 (range)	Byte 1 (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 : 0x0181CD08000D4633							

Alarms and relays status – Modbus Code 7000

Encoded on 4 bytes (U32)

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

(*)**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** (real) – Modbus code : 7010 (channel 1)
  7040 (channel 2)
  7070 (channel 3)

- **Number of digits after the decimal point** (U8) – Modbus code : 7020 (channel 1)
  7050 (channel 2)
  7080 (channel 3)

- **Unit** (U8) – 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	%RH	32
	g/kg	33
	Kj/KG	34
	°C td	35
	°F td	36
	°C Tw	37
	°F Tw	38
Pressure	kPa	50
	inWg	51
	hPa	52
	mbar	53
	mmHg	54
	mmH2O	55
	daPa	56
	Pa	57
Air velocity	m/s	64
	fpm	65
	km/h	66
Combustion	ppm	112

"Enumerations" table :

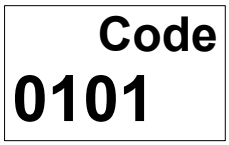
Corresponding values		0	1	2	3	4	5	6	7
Modbus	**Communication speed**	2400	4800	9600	19200	38400	115200	Unused	
Channel x	**Unit**	See units list							
Channel x	**Transmitter**	None	Probe 1		Module	Unused			
Input x	**Type**	4 - 20 mA	0 - 20 mA	0 - 10 V	0 - 5 V	0 – 2.5 V	Unused		
Alarm x	**Mode**	Deactivated	Rising edge	Falling edge	Monitoring	Unused			
Alarm x	**Security**	Negative	Positive	Unused					

This step is necessary for each configuration of the transmitter.

To have an access to the transmitter functions, and for security measures, you need to fill in a security code. By default, this security code is **0101.**

- Verify that the transmitter is powered.

➢ Connect the transmitter.
➢ Wait the end of the initialization phase.
➢ Press **OK.**
*"**Code**" is displayed with "**0000**". The first 0 flashes.*
➢ Press **OK** to move on the second 0.
It flashes.
➢ Press Up key to display 1 then press **OK**.
The third 0 flashes.
➢ Press **OK** to move on the fourth 0.
➢ Press Up key to display 1 then press **OK.**
The following screen appears :



"F 100" corresponds to the configuration folder number. 5 are existing :

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

To select the required configuration folder :
*"**F 100**" is displayed and 1 is blinking.*
➢ Press Up key until the required folder number displays (F 100, F 200, F 300 or F 500).
➢ Press **OK**.

4. F 100 : Configure the transmitter

This folder enables to configure the following parameters of the transmitter : security code, modbus, options and factory configuration.
It also enables an access to the serial number and the firmware version of the transmitter.

4.1. Access to the serial number : F100

The serial number enables to obtain activation codes for the options.

F 100 is displayed (see previous page).

- Press **OK**.
  "F 100" *displays on the screen with the serial number of the transmitter which is scrolling below.*

4.2. Access to the firmware version : F101

The F100 folder is displayed.

- Press Up key.
  "F 101" *displays on the screen with the version number of the firmware below. (Ex : 1.00)*

4.3. Lock the keyboard : F 140

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

The sub folder F101 is displayed on the screen.

- Press Up key.
  "F 140" *displays on the screen with* ***"0"*** *meaning that the locking is deactivated.*
- Press **OK.**
  "0" *flashes.*
- Press Up or Down key, "**1"** is flashing then press **OK**.
  "LOCK" *displays for a few seconds then the transmitter returns to the measured values.*
  All the keys are inactive.
  To reactivate them :
- Press 10 seconds **OK** key.
  "LOCK" *displays for a few seconds then the transmitter returns to the display of measured values and the keys are active again.*

4.4. Modify the security code : F141

It is possible to modify the security code.

The sub folder F140 is displayed on the screen.

- Press Up key.
  "F 141" *is displayed on the screen and the security code is displayed below.*
- Press **OK**.
  The first zero flashes.
- Press Up or Down key to modify the digit then press **OK.**
  The second digit flashes.
- Press Up or Down key to modify the digit then press **OK.**
  The third digit flashes.
- Press Up or Down key to modify the digit then press **OK.**
  The fourth digit flashes.
- Press Up or Down key to modify the digit then press **OK.**
  "OK ?" *is displayed on the screen.*
- Press **OK** key to validate the code modification or on **Esc** to cancel.
  The transmitter returns to the display of the F141 folder with the new code indicated below.

4.5. Configure the Modbus communication

4.5.1 Configure the slave number : F150

The F141 sub folder is displayed on the screen.

- Press Up key.
  "F 150" *is displayed on the screen.*
- Press **OK.**
  "F150" *flashes and the slave number is displayed below (the default number is 1).*
- Press **OK.**
  The first digit of the slave number flashes.
- Press Up and Down keys to modify it then press **OK.**
  The second digit of the slave number flashes.
- Press Up and Down keys to modify it then press **OK.**
  The third digit of the slave number flashes.
- Press Up and Down keys to modify it then press **OK.**
  "F150" *flashes and the selected slave number is displayed below.*

4.5.2 Configure the communication speed : F151

- Press Up and Down keys to go to the F151 sub folder.
  The communication speed in bits per second is displayed (the default communication speed is 19200 bds).
- Press **OK.**
  The communication speed flashes.
- Press Up and Down keys and select the communication speed required between the following values :
  - 2400 bds
  - 4800 bds
  - 9600 bds
  - 19.2 Kbds
  - 38.4 Kbds
  - 115.2 Kbds
- Press **OK.**
  "F151" *flashes and the selected communication speed is displayed below.*

4.6. Activate the options

To activate an option, an activation code is necessary. This code is available nearby the company distributing the device.
Available option for the ATE310 : high resolution in pressure (sub folder F170, only for the transmitters having the option).

- High resolution in pressure option : F170

*The sub folder "**F150**" is displayed on the screen.*

- Press Up key.
  "F170" *flashes on the screen and* ***"0"*** *is displayed below, meaning the option is not activated.*
- Press **OK.**
  "0" *is flashing.*
- Press up key.
  The transmitter asks for an activation code.
- Enter the activation code (same process as the security code) then press **OK.**
  "F170" *flashes on the screen and "**1**" is displayed below, meaning the option is activated.*

4.7. Activate the digital input : F180

The ATE310 has a digital input. This digital input must be activated to enable the ATE310 to communicate via Modbus (RS485) or Ethernet.

*The "**F170**" sub folder is displayed on the screen.*

- Press Up key.
  ***"F180"** flashes on the screen and "**OFF**" is displayed below.*
- Press **OK**.
  ***"OFF"** is flashing.*
- Press up or down keys to display **"ON"** then press **OK.**
  ***"F180"** flashes.*

4.8. Back to factory settings : F190

*The "**F180**" sub folder is displayed on the screen.*

- Press Up key.
  ***"F190"** flashes on the screen and **"RAZ"** is displayed below..*
- Press **OK** key.
  ***"OK?"** 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 configure the 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 the F 200 folder.
- Press twice **OK.**
  "ON" *or "**OFF"** displays below **"F200"**.*
- Press **OK.**
- Press Up and Down keys to select :
  - **"ON" :** activated channel
  - **"OFF" :** deactivated channel
- Press **OK.**
  The last zero of F200 flashes.

The **"F200"** folder allows to activate the channel 1 of the transmitter.
To activate the channels 2 and 3 go to the following folders :

- F210 for the channel 2
- F220 for the channel 3
- Perform the same activation 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.
*The **"F200"** folder flashes.*

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

The sign **"----"** indicates that the channel is deactivated.

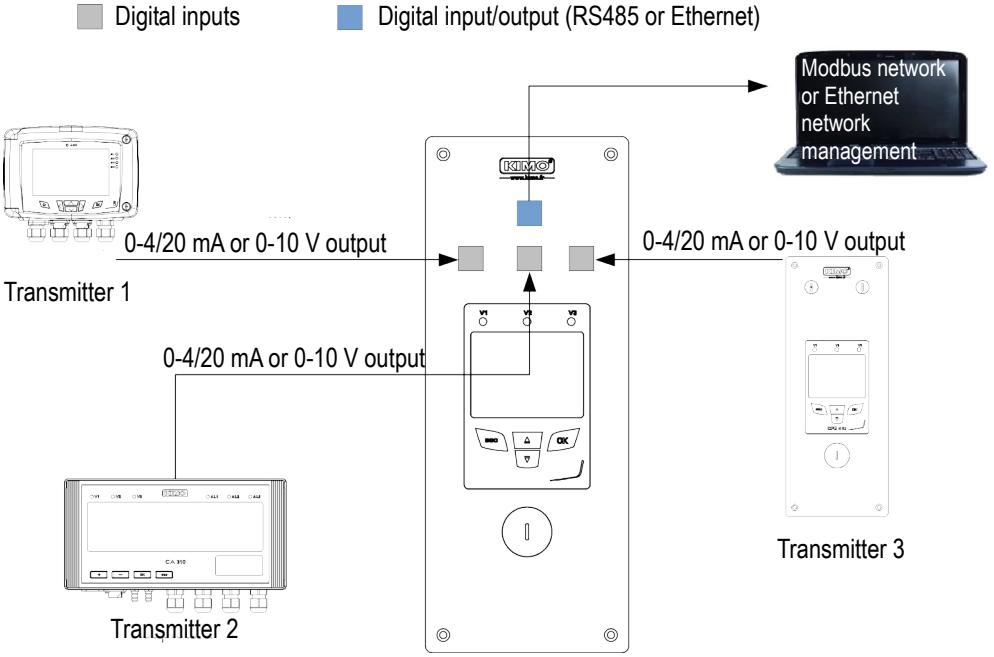
The **"F201"** sub folder allows to select the unit of the channel 1.
To select the unit of the channels 2 and 3 go to the following folders :

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

6. F 300 : analog inputs management

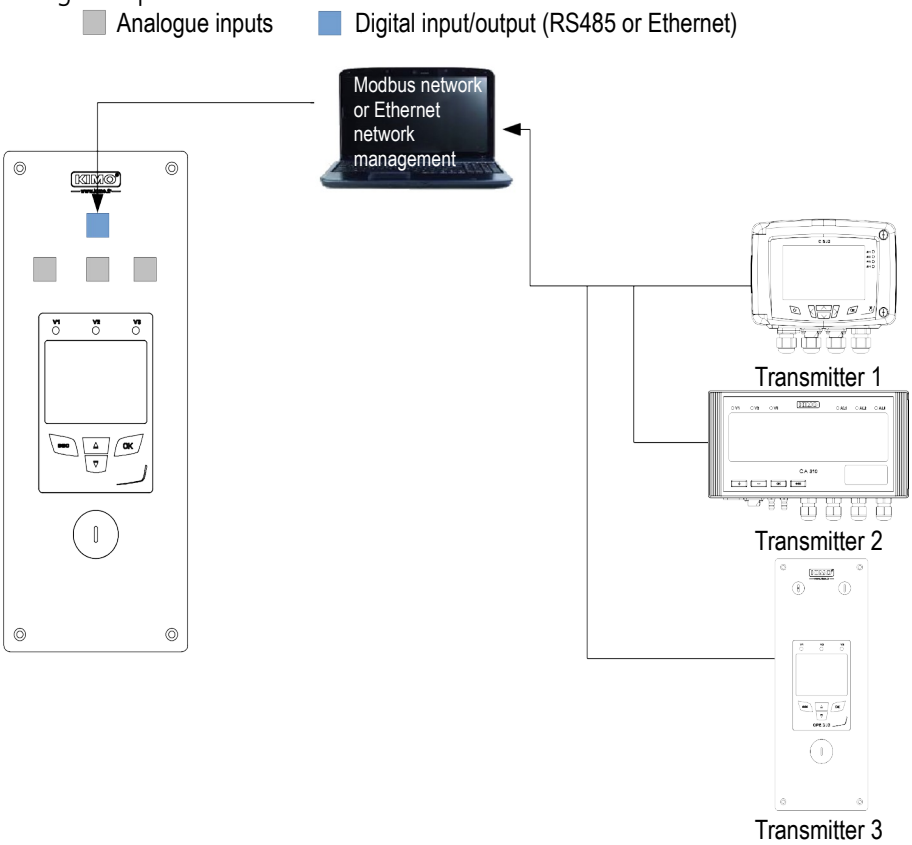
The ATE310 have 3 analog inputs in standard and a digital input in option.
The following configurations are therefore possible :

1. Display of values from a measuring system via the analog inputs and output of the values via the digital output.
   - ➢ Deactivate the digital input : **"F180"** on **"OFF".**



The ATE310 recovers the transmitted data by the transmitters 1, 2 and 3 via the analog inputs and displays them. The ATE310 can also transmit them to a computer via the RS485 or Ethernet connection.

2. Display of values from a measuring system (see point 1) via the digital input
   - ➢ Activate the digital input : **"F180" on "ON".**



The ATE310 recovers the transmitted data by the transmitters 1, 2 and 3 via the digital input in RS485 or Ethernet and displays them.

6.1. Set the analog inputs

The transmitter is powered on.

- Press **OK**.
- Enter the activation code (see page 9).
- Press **OK**.
- Press Up key to go to the F 300 folder corresponding to the analog input of the channel 1 then press twice **OK.**
  "F300" *displays with the analog input below.*
- Press **OK**.
  The analog input flashes.
- Press the Up or Down key to select the required input signal :
  - 4-20 mA
  - 0-20 mA
  - 0-10 V
  - 0-5 V
  - 0-2.5 V
- Press **OK.**

The **"F300"** folder corresponds to the analog input 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 analogue outputs

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

The values to enter depend on measurement unit selected and not of the measurement range of the transmitter.

Ex : the minimum and maximum ranges on a CPE310-S pressure transmitter (0 to ±100 Pa) with a reading in mmH_2O must be configured on a measurement range from 0 to ±10 mmH2O. See conversion tables page 16.

The transmitter is powered on.

- Press **OK.**
- Fill in the activation code (see page 9).
- Press **OK.**
- Press Up key to go to the F 301 folder corresponding to the low scale of the channel 1.
- Press **OK.**
  The first digit of the minimum range flashes.
- Enter with Up and Down keys the digit value or the negative sign of the value then press **OK.**
  The second digit flashes.
- Enter with Up and Down keys its value then press **OK**.
- Perform the same procedure for the following digits.
- Press **OK** when the last digit is configured.
  F 301 flashes, the minimum range is configured.

- Press Up key then **OK** key to enter in the F 302 folder corresponding to the high scale of the channel 1.
  The first digit of the maximum range flashes.
- Enter with Up and Down keys the figure of the digit or the negative sign of the value then press **OK.**

The second digit flashes.

- ➢ Enter with Up and Down keys its value then press **OK.**
- ➢ Perform the same procedure for the following digits.
- ➢ Press **OK** when the last digit is configured.
  F 302 flashes, the maximum range is configured.

To set the maximum and minimum ranges of the channel 2, go to the F 311 (minimum range) and F 312 (maximum range) folders and follow the settings procedure of the channel 1 ranges.
To set the maximum and minimum ranges of the channel 3, go to the F 321 (minimum range) and F 322 (maximum range) folders and follow the settings procedure of the channel 1 ranges.

6.3. Measurements conversion tables

- **Pressure**

Pa	mmH2O	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

6.4. Set the decimal point position

In order to set at best maximum and minimum ranges of the inputs, it is possible to define the resolution of the measurement to display.

The transmitter is powered on.

- ➢ Press **OK**.
- ➢ Enter the activation code (see page 9).
- ➢ Press **OK**.
- ➢ Press Up key to display the **"F 300"** folder**.**
- ➢ Press twice **OK** then press Up key to display the **"F 304"** folder corresponding to the settings of the channel 1 resolution.
- ➢ Press **OK**.
  The number of digits after the decimal point flashes.
- ➢ Press Up and Down keys to select the required number of digits after the decimal points : 0, 1, 2 or 3.
- ➢ Press **OK** to validate.
  ***"F 304"** flashes.*

The **"F304"** folder corresponds to the resolution for the channel 1.
For the channels 2 and 3 go to the following folders :

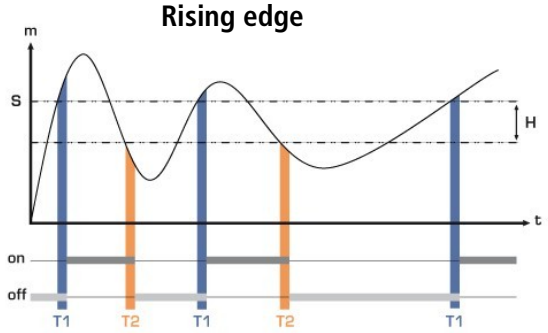
- F314 for the channel 2
- F324 for the channel 3

- ➢ Perform the same procedure as for the channel 1.

Three alarms modes are available :

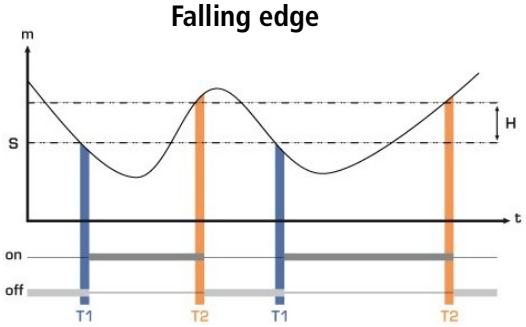
- **Rising edge (1 threshold) :** the alarm goes off when the measurement **exceeds** the threshold and stops when it goes back **below** the threshold.
- **Falling edge (1 threshold) :** the alarm goes off when the measurement goes **below** the threshold and stops when it **exceeds** the threshold.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

Rising edge



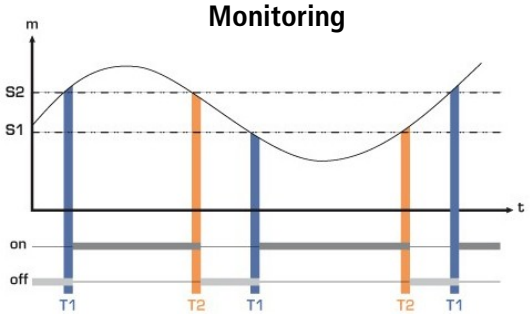
Measurement (m) > Threshold (T) during time-delay T1 → Alarm activation.
Measurement (m) < Threshold (T) - Hysteresis (H) during time-delay T2 → Alarm deactivation.

Falling edge



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

Monitoring



The alarm goes off when the measurement is outside the maximum and minimum threshold.

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

It is possible to set three different alarms :

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

The alarms settings procedure explained below corresponds to the alarm 1 setting. To set the alarms 2 and 3, go to the folder corresponding to the alarm 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 the 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" *flashes.*
- Press Up key to go to the F401 folder of the alarm 1 (F411 for the alarm 2 and F421 for the alarm 3) then press **OK.**
- Press Up or Down key to select the channel on which the alarm will be activated.
- Press **OK.**
  "F401" *flashes.*
- Press Up key to go to the F402 folder (F412 for the alarm 2 and F422 for the 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" *flashes.*
- Press Up key to go to the F403 folder (F413 for the alarm 2 and F423 for the alarm 3) then press **OK**.
  This folder is about :
  - *For a rising or falling edge, this folder corresponds to the* ***hysteresis setting****.*
  - *For a monitoring, this folder corresponds to the* ***threshold 2 setting****.*
- Set the hysteresis or the threshold 2 with the Up and Down keys.
- Press **OK** when the last digit is set.
  "F403" *flashes.*
- Press Up key to go to the F404 folder (F414 for the alarm 2 and F424 for the alarm 3) then press **OK**.
  This folder is about the ***time-delay 1*** *setting.*
- Set the time-delay 1 with Up and Down keys.
- Press **OK** when the last digit is set.
  "F404" flashes*.*
- Press Up key to go to the F405 folder (F415 for the alarm 2 and F425 for the alarm 3) then press **OK**.
  This folder concerns the ***time-delay 2*** *setting.*
- Set the time-delay 2 with Up and Down keys.
- Press **OK** when the last digit is set.
  "F405" *flashes.*
- Press Up key to go to the F406 folder (F416 for the alarm 2 and F426 for the alarm 3) then press **OK**.
  This folder is about the activation or not of the ***audible alarm****.*
- Set the audible alarm activation with Up and Down keys :
  - ***0 :*** *audible alarm is deactivated*
  - ***1 : audible*** *alarm is activated*
- Press **OK** to validate the alarm.
  "F406" *flashes.*
- Press Up key to go to the F407 folder (F417 for the alarm 2 and F427 for the alarm 3) then press **OK.**
  This folder is about the ***acknowledgement duration*** *of the alarm.*
- Set the acknowledgement duration of the alarm with Up and Down keys.
- Press **OK** when the last digit is set.

8.1. 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 indicates **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 the F 500 folder.
- Press **OK**.
  "F 520" *flashes, corresponding to the gain setting folder for the channel 1.*
- Press twice on **OK**.
  The first gain digit flashes.
- Enter with Up and Down keys the number value or the negative sign of the value then press **OK.**
  The second digit flashes.
- Enter with Up and Down keys its value then press **OK.**
- Perform the same procedure for the following digits.
- Press **OK** when the last digit is configured.
  F 520 flashes, the offset for the channel 1 is configured.

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

8.2. Add an offset

In order to compensate any possible drift of the transmitter, it is possible to add an offset to the value displayed by the transmitter by entering a 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 the F 500 folder.
- Press twice the **OK** key then Up key to go to the F 521 folder.
  "F 521" *flashes, corresponding to the setting folder of the offset for the channel 1.*
- Press **OK.**
  The first digit of the offset flashes.
- Enter with Up and Down keys the number value or the negative sign of the value then press **OK.**
  The second digit flashes.
- Enter its value with Up and Down keys then press **OK.**
- Perform the same procedure for the following digits.
- Press **OK** when the last digit is configured.
  F 521 flashes, the offset for the channel 1 is configured.

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

9.1. F 100 : Configure the transmitter

Code	Register type	Modbus	Description	Possibilities
F 100	Real	1000	Transmitter serial number	
F 101	-	1010	Firmware version	
-	U32	1020	Device identification	
-	U32	1030	Probe identification	
F 140	Boolean	1400	Keypad lock	0 : deactivated 1 : activated
F 141	U16	1410	Security code	
F 150	U8	1500	Modbus slave number	From 1 to 255
F 151	Enumeration*	1510	Modbus speed communication	2400 / 4800 / 9600/ 19200 / 38400 / 115200 bds
F 171	U32	-	Modbus option	-
F 173	-	-	Ethernet option	-
F 180	Boolean	1800	Digital input	On / Off
F 190	Boolean	1900	Restore factory configuration	

9.2. F 200 : Configure the channels and the measurement units

Code	Register type	Modbus	Description	Possibilities
F 200	Enumeration*	2010	Channel 1 activation	On / Off
F 201	Enumeration*	2000	Channel 1 unit selection	According to the channel to display
F 210	Enumeration*	2110	Channel 2 activation	On / Off
F 211	Enumeration*	2100	Channel 2 unit selection	According to the channel to display
F 220	Enumeration*	2210	Channel 3 activation	On / Off
F 221	Enumeration*	2200	Channel 3 unit selection	According to the channel to display

See Enumeration table page 8

9.3. F 300 : Manage the analogue inputs

Code	Register type	Modbus	Description	Possibilities
F 300	Enumeration*	3000	Channel 1 analogue input selection	4-20 mA / 0-20 mA / 0-10 V / 0-5 V / 0-2.5 V
F 310	Enumeration*	3100	Channel 2 analogue input selection	4-20 mA / 0-20 mA / 0-10 V / 0-5 V / 0-2.5 V
F 320	Enumeration*	3200	Channel 3 analogue input selection	4-20 mA / 0-20 mA / 0-10 V / 0-5 V / 0-2.5 V
F 301	Real	3010	Channel 1 minimum range	From -9.99 to 99.99 and from -999 to +999
F 302	Real	3020	Channel 1 maximum range	From -9.99 to 99.99 and from -999 to +999
F 304	Enumeration	3030	Channel 1 decimal point position	0, 1, 2, 3 or 4
F 311	Real	3110	Channel 2 minimum range	From -9.99 to 99.99 and from -999 to +999
F 312	Real	3120	Channel 2 maximum range	From -9.99 to 99.99 and from -999 to +999
F 314	Enumeration*	3030	Channel 2 decimal point position	0, 1, 2, 3 or 4
F 321	Real	3210	Channel 3 minimum range	From -9.99 to 99.99 and from -999 to +999
F 322	Real	3220	Channel 3 maximum range	From -9.99 to 99.99 and from -999 to +999
F 324	Enumeration*	3030	Channel 3 decimal point position	0, 1, 2, 3 or 4

9.4. F 400 : Manage the alarms

Code	Register type	Modbus	Description	Possibilities
F 400	Enumeration*	4000	Alarm mode of the alarm 1	OFF: None 1/3 : Rising edge 2/3 : Falling edge 3/3 : Monitoring
F 401	U8	4010	Alarm 1 channel selection	Channel 1 Channel 2 Channel 3
F 402	Real	4020	Threshold setting of the alarm 1	According to the channel to display
F 403	Real	4030	Threshold 2 or hysteresis setting of the alarm 1	According to the channel to display
F 404	U16	4040	Time-delay 1 alarm 1 setting	From 0 to 600 s
F 405	U16	4050	Time-delay 2 alarm 1	From 0 to 600 s

Code	Register type	Modbus	Description	Possibilities
			setting	
F 406	Boolean	4080	Audible alarm 1	0 : activated / 1 : deactivated
F 407	U8	4070	Alarm 1 acknowledgement duration	From 0 to 60 minutes

See Enumeration table page 8

F 410	Enumeration*	4100	Alarm mode of the alarm 2	OFF: None 1/3 : Rising edge 2/3 : Falling edge 3/3 : Monitoring
F 411	U8	4110	Alarm 2 channel selection	Channel 1 Channel 2 Channel 3
F 412	Real	4120	Threshold 1 setting of the alarm 2	According to the channel to display
F 413	Real	4130	Threshold 2 or hysteresis setting of the alarm 2	According to the channel to display
F 414	U16	4140	Time-delay 1 alarm 2 setting	From 0 to 600 s
F 415	U16	4150	Time-delay 2 alarm 2 setting	From 0 to 600 s
F 416	Boolean	4180	Audible alarm 2	1 : activated / 0 : deactivated
F 417	U8	4170	Alarm 2 acknowledgement duration	From 0 to 60 minutes
F 420	Enumeration*	4200	Alarm mode of the alarm 3	OFF: None 1/3 : Rising edge 2/3 : Falling edge 3/3 : Monitoring
F 421	U8	4210	Alarm 3 channel selection	Channel 1 Channel 2 Channel 3
F 422	Real	4220	Threshold 1 setting of the alarm 3	According to the channel to display
F 423	Real	4230	Threshold 2 or hysteresis setting of the alarm 3	According to the channel to display
F 424	U16	4240	Time-delay 1 alarm 3 setting	From 0 to 600 s
F 425	U16	4250	Time-delay 2 alarm 3 setting	From 0 to 600 s
F 426	Boolean	4280	Audible alarm 3	1 : activated / 0 : deactivated
F 427	U8	4270	Alarm 3 acknowledgement duration	From 0 to 60 minutes

*See Enumeration table page 8

9.5. F 500 : Set the measurement

Code	Register type	Modbus	Description	Possibilities
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 the channel to display
F 531	Real	5310	Channel 2 offset	According to the channel to display
F 541	Real	5410	Channel 3 offset	According to the channel to display