Technical manual

Minisonic II

Portable

Ultraflux

Ultrasonic flowmeters

Introduction

Thank you for choosing the **Minisonic II** Portable; we hope you will appreciate all its metro-logical qualities and ease of use.

The purpose of this manual is to guide you as simply as possible towards using the instrument confidently to achieve results that match your expectations.

Specializing in ultrasonic flow meters since 1974, Ultraflux develops, manufactures and sells solutions based on the principle of differential ultrasonic transit times.

This method provides non-intrusive, constant and bi-directional flow measurements.

Ultraflux flow meters allow non-intrusive or intrusive, constant or occasional flow measurements on any type of homogeneous fluid (liquid or gas) and through any type of homogeneous material.

Always aiming to better serve its customers' needs while preserving the environment, Ultraflux has been committed for many years to a quality improvement and sustainable development policy.

Since it started in 1974, Ultraflux has developed and manufactured all its products in France, in order to ensure that its production processes are reliable and meet the standard required.

ISO certification

Ultraflux is certified ISO 9001 and ISO 14001.
You can download our certificates via the below links: ISO9001 – Ultraflux certificate ISO14001
Ultraflux quality certificates

ATEX certifications

Some Ultraflux products are also certified for use in ATEX explosive atmospheres. Download the official documents:
Ultraflux ATEX Certification Ultraflux ATEX Notification

Contents

Introduction 2

Contents 3

Safety instructions 4

- CE marking 5
- Contact address 5
- Recycling the device 6

Connecting the inputs / outputs 7

- Power supply and battery charging cable 8
- Pulse and analog outputs 9
- Measuring probes connector 10
- USB connector 11

Applying a measuring point 12

- Creating a measuring point 12
- Choosing a location for the probes 12
- Choosing a measuring mode 13
- Positioning the probes 13
- Take readings on straight pipe runs 14
- Selecting the probe type 17
- Fitting the probes and connecting them 18

Configuring the Minisonic 19

- Description of navigation 19
- Presentation of the measurement screens 22
- Configuration menus 23

Set-up example 32

Low power mode 34

Software update procedure 36

Logger / Data upload and exploitation 38

Safety instructions

Using the device

Equipped with ultrasonic probes, the device measures the flow of a fluid (gas or liquid) in a pipe. The device must be properly configured to obtain correct results.

You are recommended to have the device configured by qualified Ultraflux personnel. This is strongly recommended if your equipment is used to regulate a process, as part of a monitoring system or in the case of other applications where an incorrect flow measurement would carry a risk.

In normal operation, the device should not become so hot as to cause burns. No special precautions are required to allow it to cool down. If the temperature of the enclosure should become abnormally high, it is essential to switch off the device and send it to Ultraflux for expertise. If the device should catch fire, switch it off without opening or touching it, then call the relevant departments to protect the premises.

The device must not be used beyond the capacities and specifications indicated in this manual. It should be stored in a dry place. It is recommended that you wear suitable PPE (Personal Protection Equipment) when handling and installing the device.

The device may only be modified or disassembled by Ultraflux personnel, otherwise, Ultraflux declines all liability.

Connectors must be plugged in and removed with the device switched off and isolated. Ultraflux cannot be held responsible for incidents caused by failure to follow these instructions.

Equipment connected to the device

All equipment connected to the device must comply with the applicable safety standard and be equipped with safety extra-low voltage (SELV) circuits (double insulation between the primary and secondary).

Maintenance of the device

Maintenance operations on the device may only be carried out by Ultraflux personnel (after-sales service), using only parts supplied by Ultraflux.

Temperature limits for the Minisonic II converter

Use from - 20°C à 50°C
Charging from 0°C à 45°C
Storage from -20°C à 50°C

CE marking

Ultraflux **Minisonic II** Portable flowmeters comply with CE certifications.

EN 55016-2-1	Conducted emissions measurements - criterion A
EN 55016-2-3	Radiated emissions measurements from 30MHz to 6GHz
EN 61000-4-6	Immunity to induced conducted disturbances - Criterion B
EN 61000-4-2	Immunity to electrostatic discharges - Criterion B
EN 61000-4-3	Immunity to radiated electromagnetic fields - Criterion A
EN 61000-4-4	Electrical Fast Transient / Burst Immunity - Criterion B
EN 61000-4-5	Surge immunity - Criterion B
IEC 60529	Degrees of protection provided by enclosures (IP Code)

Contact address

For any request for information, do not hesitate to contact us:

Postal address
Bâtiment Texas
9 Allée Rosa Luxemburg
Éragny Parc – Parc des Bellevues
95610 Éragny sur Oise

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Bâtiment Texas
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Éragny Parc – Parc des Bellevues
95610 Éragny sur Oise

After-sales
sav@ultraflux.fr
+33 (0)1 30 27 29 30

Email address contact@ultraflux.fr

Recycling the device

In accordance with decree no. 2005-829 of 20 July 2005 and decree no. 2009-1139 of 22 September 2009 concerning the obligations to collect, treat and dispose of electrical and electronic equipment, batteries and accumulators in France, Ultraflux delegates responsibility for the financial and logistical recovery to users who will manage their waste themselves. Separate collection and recycling of your waste at the moment of disposal will help preserve natural resources and guarantee recycling respectful of the environment and human health. For more information on the recycling centre nearest to your site, contact your City Hall or waste disposal department.

Connecting the inputs / outputs

Figure 1 - Connectors on the upper face

Figure 2 - Connectors on the lower face

Power supply and battery charging cable

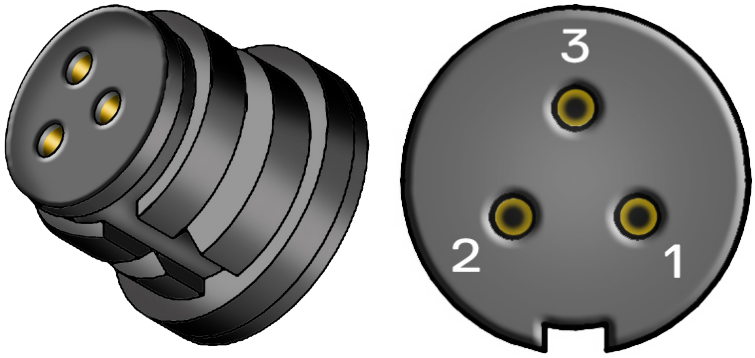


Figure 3 - Power supply connector

Charging the Minisonic II

Plug the charger into a 100-240V ac 50/60 Hz mains supply, then insert the plug in the power supply connector. The green «Charging» LED should come on. It goes out when charging is complete.
You can check the device's charging progress on the information screen.

> Important:
> Using a power supply different from the one supplied with the device is not covered by the Ultraflux guarantee.

Battery pack service life

The battery pack service life depends on the number of charge/discharge cycles. The service life may be shortened by incorrect use or maintenance. For example, if the batteries are left discharged for a long period of time or are subjected to incomplete charge/discharge cycles.

The battery pack can be replaced. Although this is expected and easy to do, nevertheless it must be done in our workshops for it to be covered by our guarantee.

We cannot be held responsible for any unauthorized operation.

Pulse and analog outputs

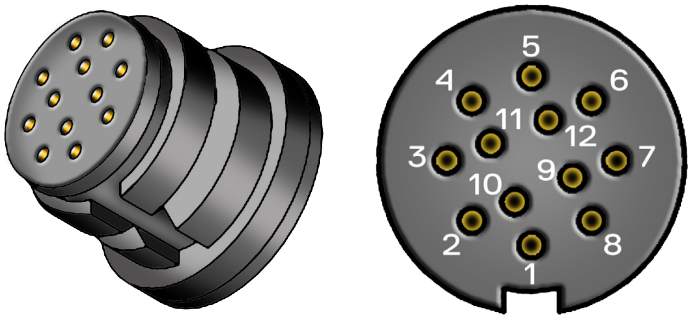
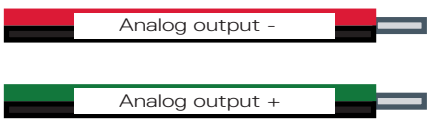


Figure 4 - Connector outputs

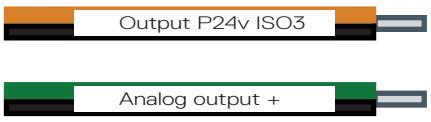
Pin	Function	Wire
1	-	
2	-	
3	-	
4	Pulse output A	
5	Pulse output A	
6	Pulse output B	
7	Pulse output B	
8	Analog. output -	
9	Analog. output +	
10	P 24 V - ISO 3	
11	-	
12	-	

Passive analog output



Wires to be used on the **Minisonic II** to go to a reciever that supply the power to the measurement loop (**Minisonic II** : 4-20 mA passive)

Active analog output



Wires to be used on the **Minisonic II** to go to a reciever that do not supply the power to the measurement loop (**Minisonic II** : 4-20 mA active)

Measuring probes connector

The device is fitted with a connector to accommodate a pair of probes which are linked by a Y-cable.

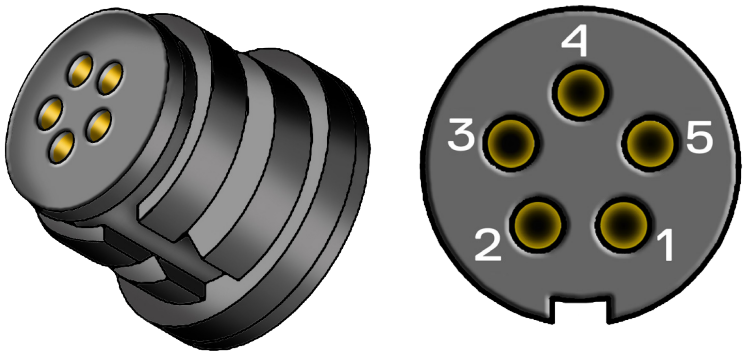


Figure 7- Probe connector and connection «Y» cable

Tags on the wires stand for:

1. Connector to be plugged on the **UPSTREAM** sensor
2. Connector to be plugged on the **DOWNSTREAM** sensor

USB connector

The device can be used like a USB key on a computer or a USB key may be connected through an adapter to it for file transfers.

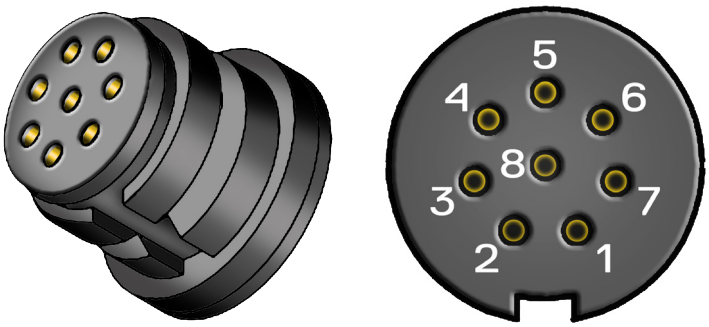
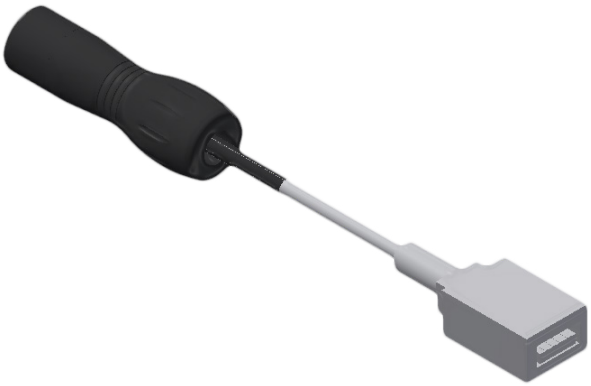


Figure 8- USB connector and Adapters: USB Key



Applying a measuring point

Creating a measuring point

In addition to the flow meter, there are certain items required, when creating a measuring point

- A pair of probes
- A positioning terminal board
- A Y-cable supplied with the device
- All the accessories supplied in the case (Coupling gel...)

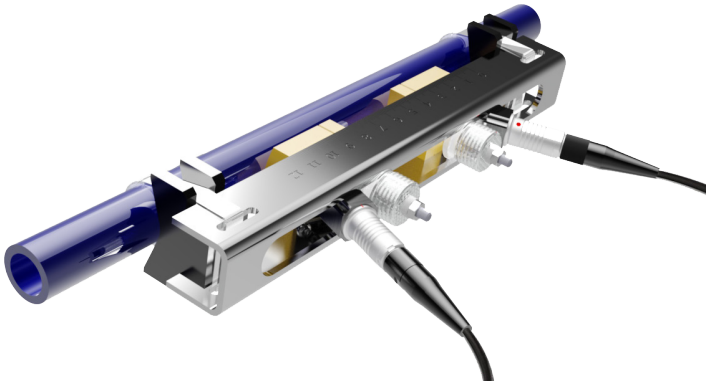


Figure 9- Terminal board with probes and Y-cable

Choosing a location for the probes

The following paragraphs set out the main precautions to be taken when choosing a location for the probes.

To achieve the most accurate measurement possible, it is necessary to have what is called 'a developed flow profile'. The aim is to obtain a hydraulic profile which is as predictable and symmetrical as possible.

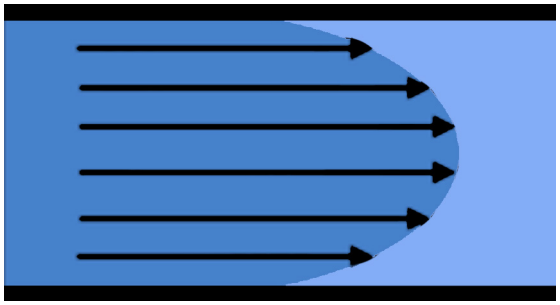


Figure 10a- Symmetrical hydraulic profile

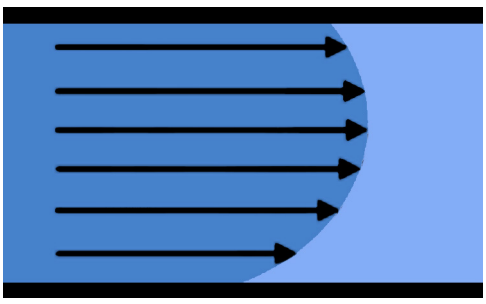


Figure 10b- Asymmetrical hydraulic profile

Choosing a measuring mode

The external probes may be installed in different ways, depending on the number of times the ultrasonic wave reflects off the pipe wall. There are four programmable types in the device.

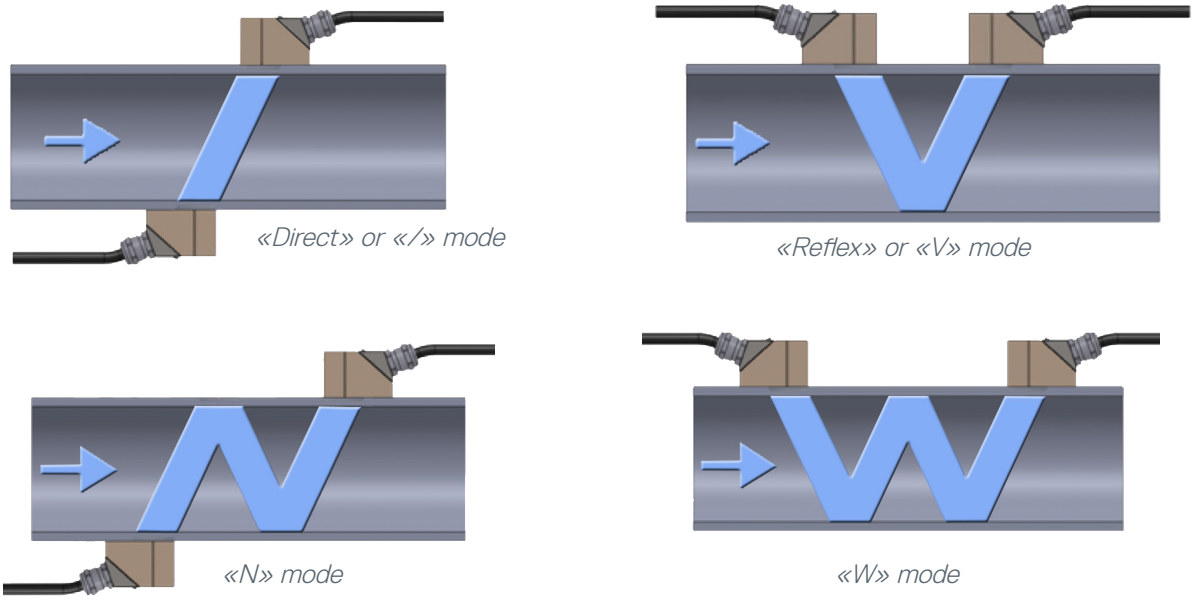


Figure11 - Summary of mounting modes

V mode is to be preferred, since it is suitable for use in the majority of cases.

The longer the path, the more effective the measurement principle. (Significant up and downstream transit time difference). However, the ultrasonic echo weakens as the distance increases and will therefore be difficult to process. A compromise must therefore be found between precision and ease of transmitting and receiving the ultrasound waves. This compromise depends on the application (fluid, wall quality, diameter, etc.).

In practice, multiple reflection modes are reserved for smooth pipes with no clogging or corrosion.

Positioning the probes

Measuring probes must be positioned in such a way as to avoid zones where there is a risk that air bubbles or sediment could be present.

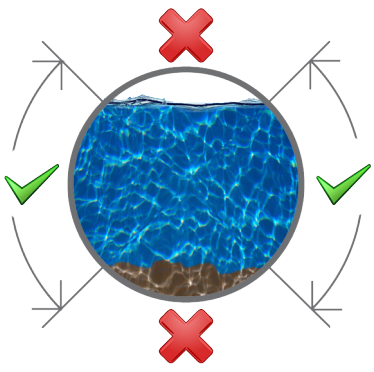


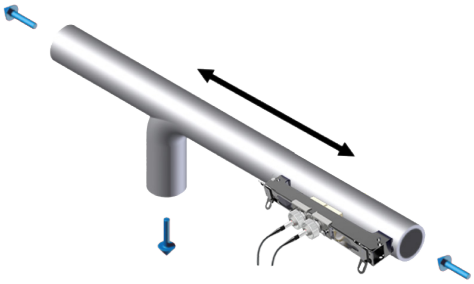
Figure 12- Asymmetrical hydraulic profile

Take readings on straight pipe runs

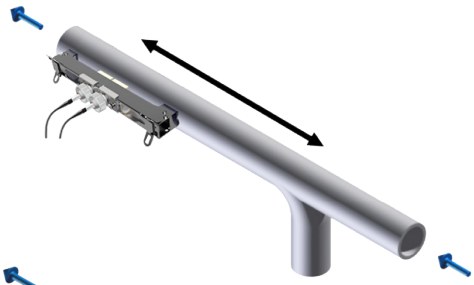
The rules to be applied to obtain the ideal measurement conditions, depending on the arrangement of the pipes, are known. The following paragraphs provide information on the general rules to be followed.

The following indications show, for liquids, the minimum distances (L) to be complied with before and after a disturbance depending on the pipe's inside diameter (D), so that the errors induced by these disturbances remain less than ±1 %.

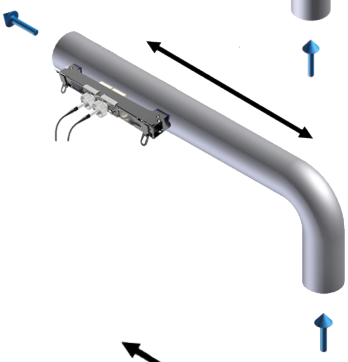
Measurement close to an elbow



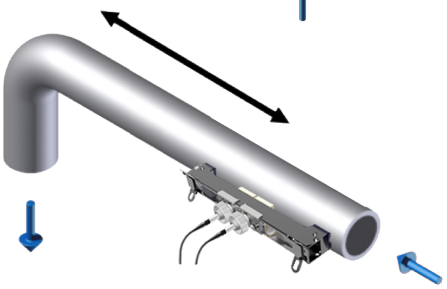
V «Reflex» mode : Distance > (3x) the diameter of the pipe
/ «Direct» mode: Distance > (5x) the diameter of the pipe



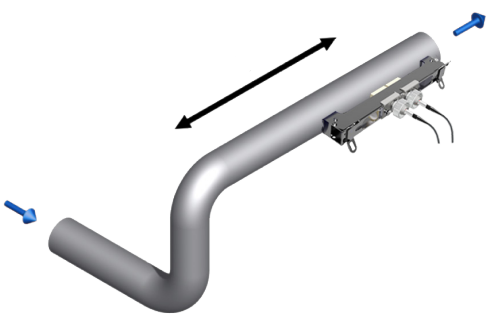
V «Reflex» mode : Distance > (15x) the diameter of the pipe
/ «Direct» mode: Distance > (20x) the diameter of the pipe



V «Reflex» mode : Distance > (15x) the diameter of the pipe
/ «Direct» mode: Distance > (20x) the diameter of the pipe

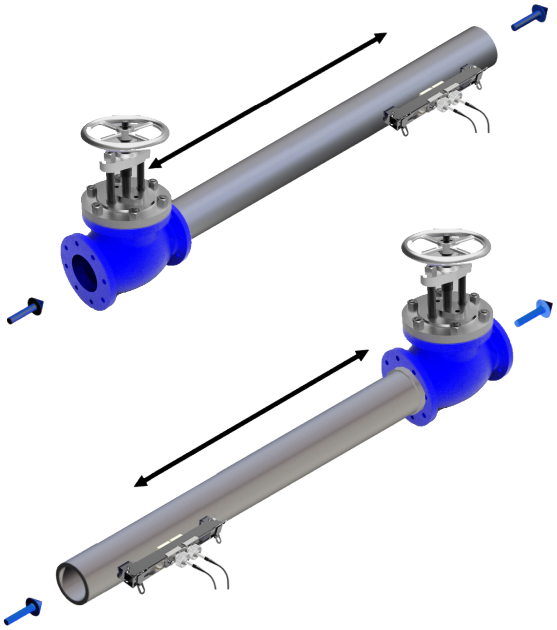


V «Reflex» mode : Distance > (3x) the diameter of the pipe
/ «Direct» mode: Distance > (5x) the diameter of the pipe



V «Reflex» mode : Distance > (15x) the diameter of the pipe
/ «Direct» mode: Distance > (20x) the diameter of the pipe

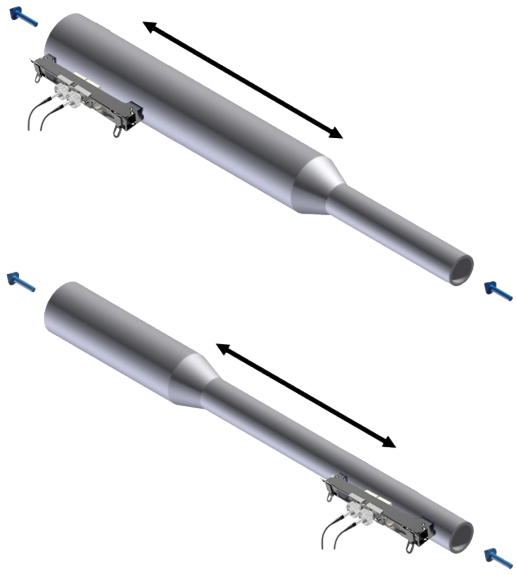
Measurement close to a valve



V «Reflex» mode : Distance > (15x) the diameter of the pipe
/ «Direct» mode: Distance > (20x) the diameter of the pipe

V «Reflex» mode : Distance > (5x) the diameter of the pipe
/ «Direct» mode: Distance > (8x) the diameter of the pipe

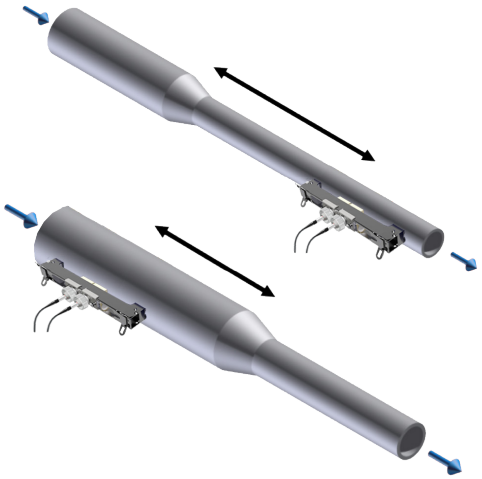
Measurement close to a divergent.



V «Reflex» mode : Distance > (30x) the diameter of the pipe
/ «Direct» mode: Distance > (40x) the diameter of the pipe

V «Reflex» mode : Distance > (3x) the diameter of the pipe
/ «Direct» mode: Distance > (5x) the diameter of the pipe

Measurement close to a convergent.



V «Reflex» mode : Distance > (10x) the diameter of the pipe
/ «Direct» mode: Distance > (15x) the diameter of the pipe

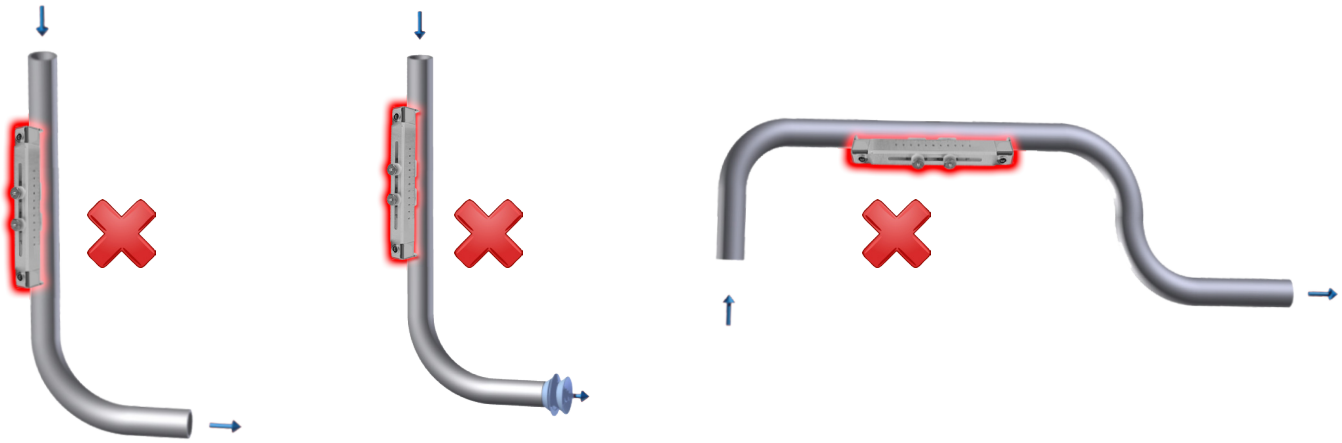
V «Reflex» mode : Distance > (3x) the diameter of the pipe
/ «Direct» mode: Distance > (5x) the diameter of the pipe

Note:

The values given must be multiplied by 2.5 for gases.
Convergents with an overall angle less than 16° are ignored and are considered as straight runs (this is not the case for divergents).

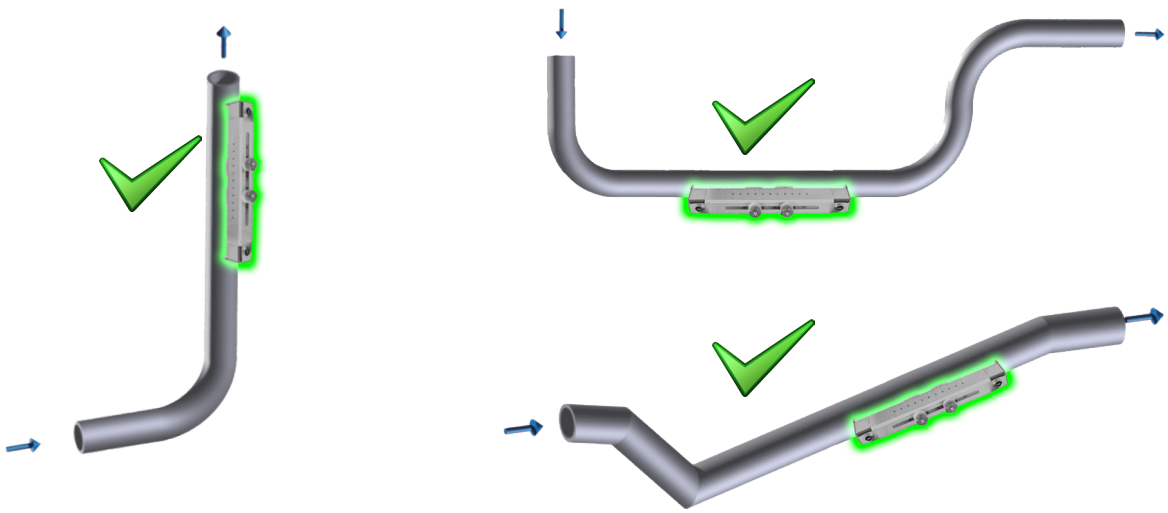
Locations not recommended:

Vertical pipe with downflow, especially in where there is a free flow



Recommended locations:

Pipes with upflow.



Selecting the probe type

The two probes are chosen to suit the pipe diameter.

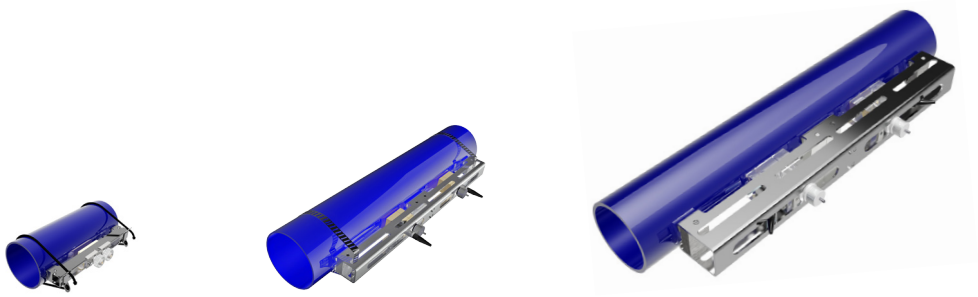
The probe frequency has an important effect on measurement quality (see main measurement index).

The Minisonic can be used with a number of probe types which are adapted to the different pipe diameter ranges.

The table below sets out the average usage ranges for probes according to their frequencies.

Frequencies	Pipe diameter
2 MHz	10 - 100 mm
1 MHz	40 - 1 000 mm
500 KHz	100 - 10 000 mm

Note: The values provided in the table correspond to the pipe inner (nominal) diameter.



2 MHz *1 MHz* *500 kHz*

Figure 13- Probes for portable

The probes (sensors) must be installed and aligned very carefully in order to obtain good flow rate measurement accuracy.

Preparing the pipe

To install external (clamp-on) probes, thoroughly clean the pipe where the probes will be installed. (See distance between probes 'here'.) The pipe must be cleaned with absorbent paper or a piece of cloth. If the pipe is very dirty or corroded, use a wire brush or a scraper. There is no need to remove sound paint. It is even recommended that you leave it in place to prevent any corrosion. The same applies for most plastic coatings. However, if the paint is blistered and comes away easily (test it by scraping with your nail or a pointed tool), remove it from the local area. Porosity impairs the propagation of ultrasound waves.

Figure 14a - Preparing the pipe

Fitting the probe

First move the probes apart to the distance calculated by the device.
Then apply coupling gel on the probe/pipe contact surface.

Attach the probes to the pipe using straps or a dedicated support. Check the presence and continuity of the coupling (the formation of a layer of air between the pipe wall and the probe must be avoided at all costs). To avoid this problem, do not slide the probes too much (which could affect the coupling film).

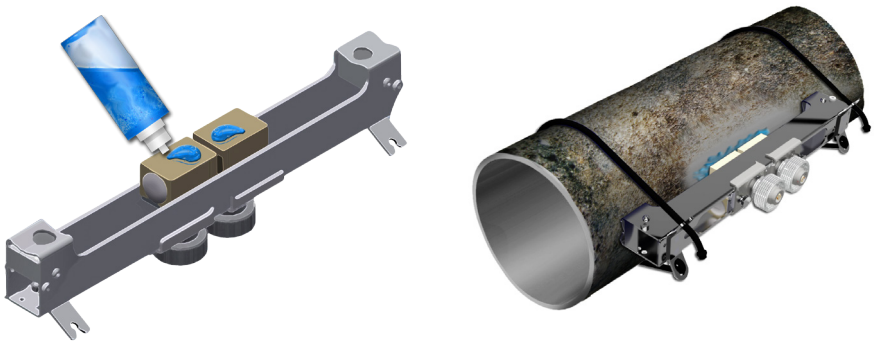


Figure 14b - Fitting the probes

Configuring the Minisonic

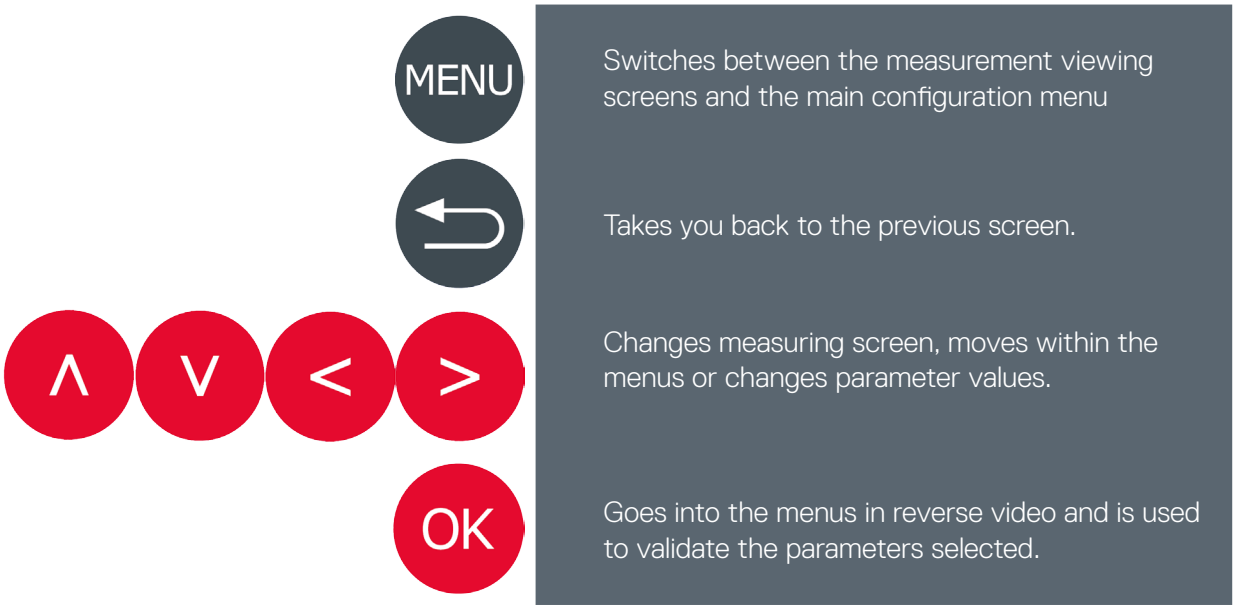
Description of navigation

The menus detailed in this manual correspond to the *Normal* mode of the setup level menu.

The **Minisonic II** Portable is equipped with a screen and a keypad for configuring it and viewing measurements directly.

Keypad

The keypad has seven keys which have different uses in different menus. However, navigation between the fields and menus is always based on the same principles:



Types of screen

The **Minisonic II** Portable is based on several types of screen which are encountered during navigation and which operate in the same way.

Alphanumeric field editing screen:

Figure 14 - Alphanumeric field editing screen

These screens allow all the device's alphanumeric fields, such as the name of the pipe, configuration names, etc., to be edited.

1 Field currently being edited

Allows the field currently being edited to be viewed. A character is selected using the multi-directional keys; it can then be replaced by selecting a character on the keypad.

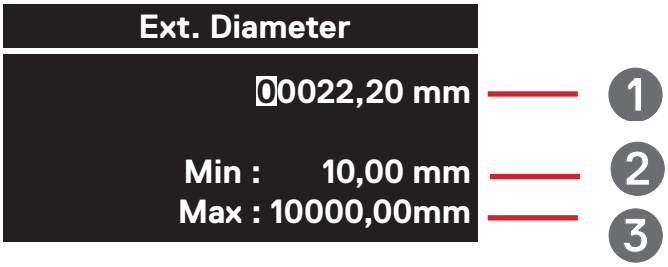
2 Alphanumeric keypad
Selects characters to place in the field by pressing «OK».

3 «Delete» key
This key deletes characters in the field being edited.

4 « CapsLock » key
Switches the upper case keypad to a lower case keypad.

5 « OK » key
Confirms the field and exits the screen.

Numeric field edition screen



< > Moving from digit to digit

∧ ∨ Increments or decrements the value of the digit selected

OK Confirms the modification and returns to the previous level

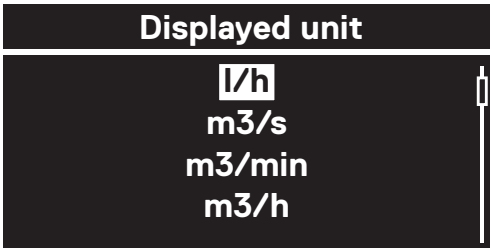
This type of screen allows all the device's digital parameters to be entered.

1 Fields currently being edited:
The digit being edited is shown in black on a white background. The field value is modified using the up and down keys. The left and right direction keys are used to change the digit being edited.

2 Minimum field value:
This number is the minimum value that may be entered.

3 Maximum field value:
This number is the maximum value that may be entered.

Screen for selecting from a list



∧ ∨ Selecting from the list offered

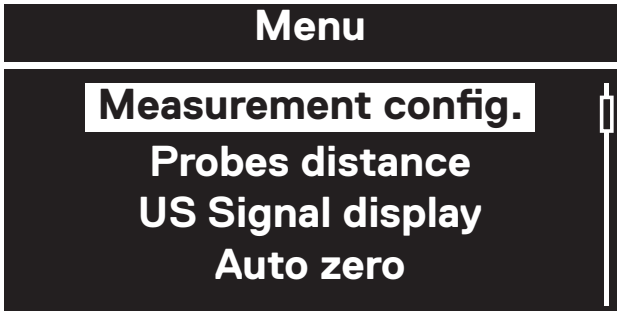
OK Confirms the modification and returns to the previous level

Presentation of the measurement screens

MENU — Access to the menu

∧ ∨ — Viewing the various measurement screens

1. Main measurement variable name
   Example: Volumetric flow rate / Velocity...
2. Main measurement variable value
3. Secondary measurement variable name
   Example: Celerity / velocity / gain
4. Quality index
   Indicates the percentage of successful ultrasonic shots from all the shots fired by the Minisonic. This factor can be used to assess the measurement difficulty, for example it is lower with loaded or aerated water.
5. Secondary measurement variable value
6. Physical unit for the main measurement variable
7. Physical measurement for the secondary measurement variable



∧ ∨ Chapter selection

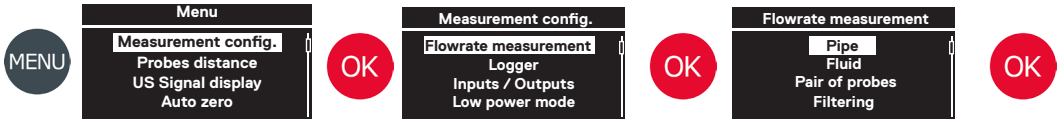
OK Confirms the entry in the chapter in «reverse video»

Return to previous chapter

MENU Return to measuring screen.

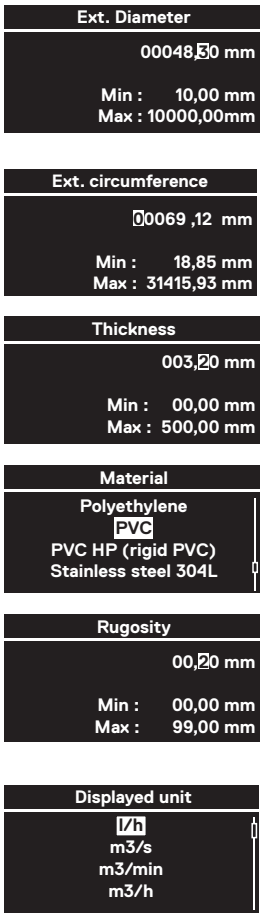
Measurement config.	Configuring all the characteristics of a measuring point. In this menu you will set up the device, so that it works for a specific application: Characteristics of the pipe / Characteristics of the fluid / Characteristics of the probes used. (See detail)
Probe distance	Tells you what distance to allow between the probes, according to the data entered in «Measurement Configuration» (See details)
US Signal display	Allows you to see the nature and quality of the measurement echo. This is a determining factor in the analysis of measurement conditions and allows you to identify any configuration error (pipe diameter or thickness, etc.) (See details)
Auto zero	Gives you the ability to refine the device's response under strict conditions of «Pipe full + No flow» (See details)
Advanced meas.	Provides access to the details of a number of measurements that could guide you in your search for better performance
Device configuration	Adjusting information

Measurement config. / Flowrate / Pipe

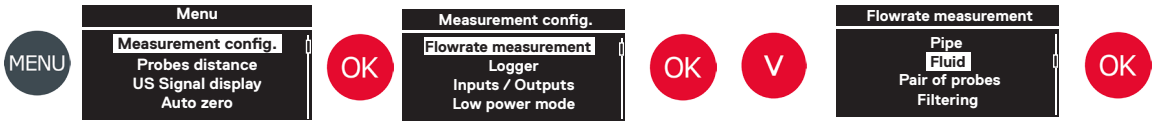


Setting up the pipe characteristics

Ext. diameter	Pipe external diameter setting
Ext. circumference	Possibility to set the circumference instead of the diameter
Thickness	Pipe thickness setting In case of homogeneous multi-layer pipe: Ability to set 3 different thickness for 3 different material in «Advanced» mode only.
Material	Pipe thickness setting In case of homogeneous multi-layer pipe: Ability to set 3 different material in «Advanced» mode only.
Roughness (RZ)	setting of the pipe internal surface specific rugosity
Displayed unit	Adjusting the volume flowrate unit Determines the physical unit associated with the display of the volume flow rate. Example: m3/h - l/min...

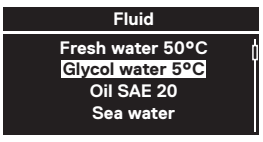


Measurement config. / Flowrate / Fluid



Setting the characteristics of the fluid to be measured

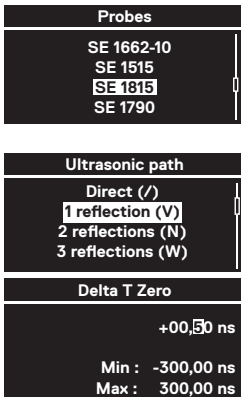
Fluid	Selecting the fluid to be measured from



Measurement config. / Flowrate / Pair of probes

Setting up the probes used with the device

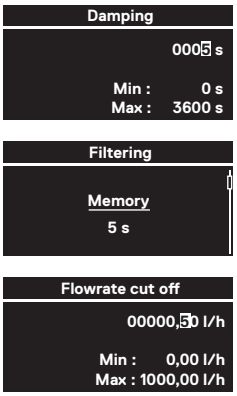
Probes	Selecting the probe model from a drop-down list
Ultrasonic path	Choosing the probe fitting mode
Delta T Zero	Transit time difference for the sound wave at zero flow. Value entered automatically with an «Auto Zero», see here



Measurement config. / Flowrate / Filtering

Setting up the filtering of the measurement

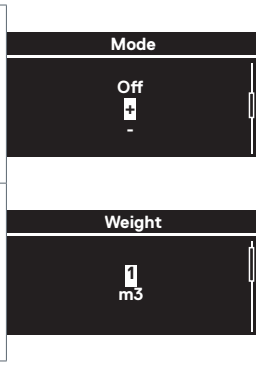
Damping	Measurement damping time
Memory	Time maintaining last measurement value in case of signal loss
Flowrate cut off	Threshold of flowrate under which the measurement is forced to zero. (Display and output)



Measurement config. / Flowrate / Totalizer

Totalizer setting

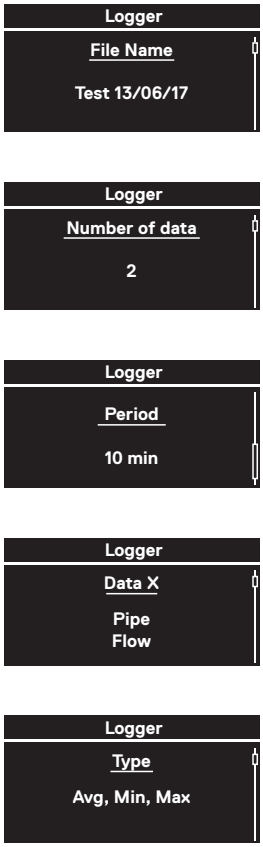
Mode	Totalizer mode setting (Off, + or -)
Weight	Selecting the weight and unit for the totaliser



Measurement config. / Logger

Setting up the internal recorder

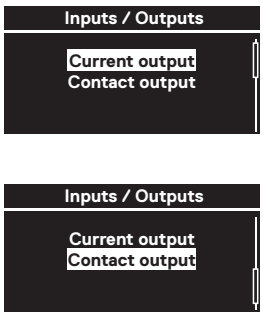
File name	Entering the record name associated with the record file.
Number of data	Choose the the number of variable data to be recorded
Period	Choose sampling period value
Data X	Select the «X» data type (Status, Flowrate, Velocity...) This must be done for all the recorded data
Type	Select the type of record (applicable for all recorded datas) · Average · Average + Min + Max · Average + Min + Max + Std



Measurement config. / Inputs-Outputs

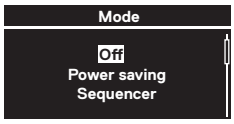
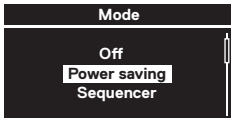
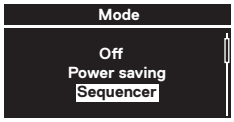
Inputs and outputs setting

Current output	Setting up the characteristics of the 4-20 mA analog output · Activation · Setting the flow corresponding to 4mA · Setting the flow corresponding to 20mA · Instant flow unit for that setting
Contact output	Setting the characteristics for the logic output · Activation · Mode « All Pulses / Direction » or « Pulses+ and Pulses- » · Pulse length



Measurement config. / Low power mode

Setting up battery safety modes

Off	The flowmeter is functioning continiously without any power safety option	
Low power	OLED display shut off and flow calculation reduced to 1 per second (Display switch on again by pressing any key)	
Sequencer	Mesurement duration indicates how long is each periode of active and continuous flow calculation Period indicates how often the instrument wakes up	

Measurement config. / Settings level

Set-up modes

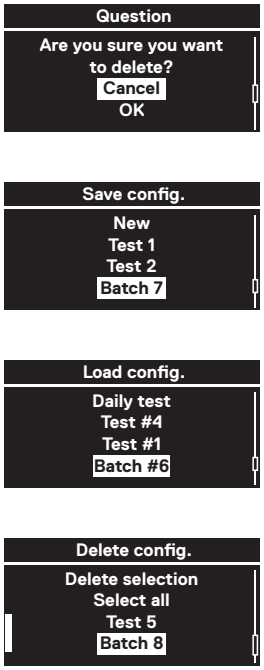
Simple	Contains the minimum parameters necessary for making water flow measurements
Normal	Contains the essential parameters for making all product flow measurements
Advanced	Contains all **Minisonic II** available parameters

The **Minisonic II** was designed to adapt to the user's knowledge of making ultrasonic flow measurements

Measurement config. / Config. Management

Configurations management

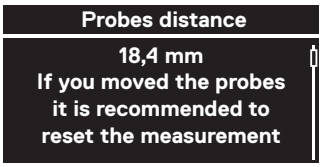
Reset config.	Delete all data from the current configuration (Return to default configuration values)
Save config.	Save measurement configuration data
Load config.	Upload measurement configuration data for immediate use
Delete config.	Delete configuration menu Delete selected configuration or All



Probes distance

Display the distance between the probes to be fitted

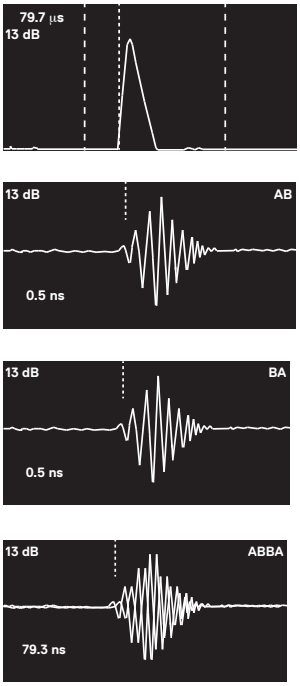
Probes distance	Display of the distance to be fitted between the probes. This distance is calculated by the device from the parameters entered in the device: · Diameter / thickness / pipe material · Type of fluid · Type of probes



US signal display

Signal echo visualisation

Wide vision	Wide view of the quality of the signal measured, according to the programmed parameters and the measurement conditions
Signal from probe A to B	View of the ultrasound echo emitted by probe A and received by probe B.
Signal from probe B to A	View of the ultrasound echo emitted by probe B and received by probe A.
Déphasage AB-BA	View of the ultrasound wave's transit time difference between an AB transit and a BA transit

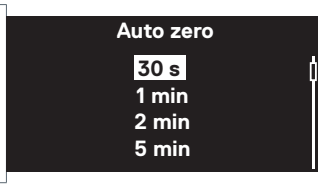


< > Moves the viewing window for appraising the signal
OK Re-centres the view on the measurement point

Auto Zero

Adjustment of the **Minisonic II** Portable **at zero flow**

Auto zero	Determine the auto zero duration. Long duration : fine «zero» tuning



Note, this operation can only be carried out under strict conditions of:

- **Full pipe**
- **Zero flowrate**

Advanced meas.

Viewing the diagnostic and fault variables

Faults	Exhaustive list of faults read by the device	Faults Flowrate 1/3 Velocity 2/3
Flowrate	View of advanced variables allowing the adjustment, improved reliability or validation of the quality of measurement.	Pipe Velocity 2,350 m/s Celerity 1482 m/s IQ 100 % Kh 0,723

System configuration

System set-up

Main	Definition of data for: · Display and programming language · mm or inches distance units · Activation of low consumption mode · Date display mode (DD/MM/YYYY or MM/DD/YYYY)	Main Language English
Communications	For Ultraflux factory appraisal use only	Communications USB
Informations	Display of: · Software version (Firmware) · Electronic board version (Hardware) · Device serial number	Informations Firmware Hardware Serial number
Date and time	Setting and adjustment of: · Date · Time	Date and Time Date Time

Set-up example

A flow measurement by an ultrasonic flowmeter requires the following informations:

- Pipe characteristics
- Type of fluid
- Sensor model

Example :

Steel pipe /External diameter 48.3mm / Thickness 3.2mm
Measured fluid: Raw water at 50°C
Probes used: Kit SE 1790

Use following chart to set up this application example

Flowrate IQ100%
20,000 l/h
Totalizer
000000000026 m3
OK
Menu
Measurement config.
Probes distance
US Signal display
Auto zero
Measurement config.
Flowrate measurement
Logger
Inputs / Outputs
Low power mode
Flowrate measurement
Pipe
Fluid
Pair of probes
Filtering
Pipe
Ext. Diameter
22,00
Ext. Diameter
00022,20 mm
Min : 10,00 mm
Max : 10000,00mm
Digit to digit
Modify value
Validation
Ext. circumference
69,12 mm
00069 ,12 mm
Min : 18,85 mm
Max : 31415,93 mm
Thickness
2,00 mm
00002,00 mm
Min : 00,00 mm
Max : 500,00 mm
Material
PVC
Polyethylene
PVC
PVC HP (rigid PVC)
Stainless steel 304L
Select from the list
Displayed unit
l/h
l/h
m3/s
m3/min
m3/h
Fluid
Fresh water 50°C
Glycol water 5°C
Oil SAE 20
Sea water
Pair of probes
Probes
SE1815
Probes
SE 1662-10
SE 1515
SE 1815
SE 1790
Ultrasonic path
1 reflection (V)
Direct (/)
1 reflection (V)
2 reflections (N)
3 reflections (W)
Setup validation
5 datas have been modified :
Use modifications
Discard modifications
Probes distance
Pair of probes 1
46,9 mm
Validate this screen only after having
positionned the probes correctly so that the measurement initializes
Setup validation
modified :
Use modifications
Discard modifications
Continue modifications
measurement initializes under good conditions.
Thank you
OK

Low power mode

The Minisonic II Portable allows energy safety through :

Power saving

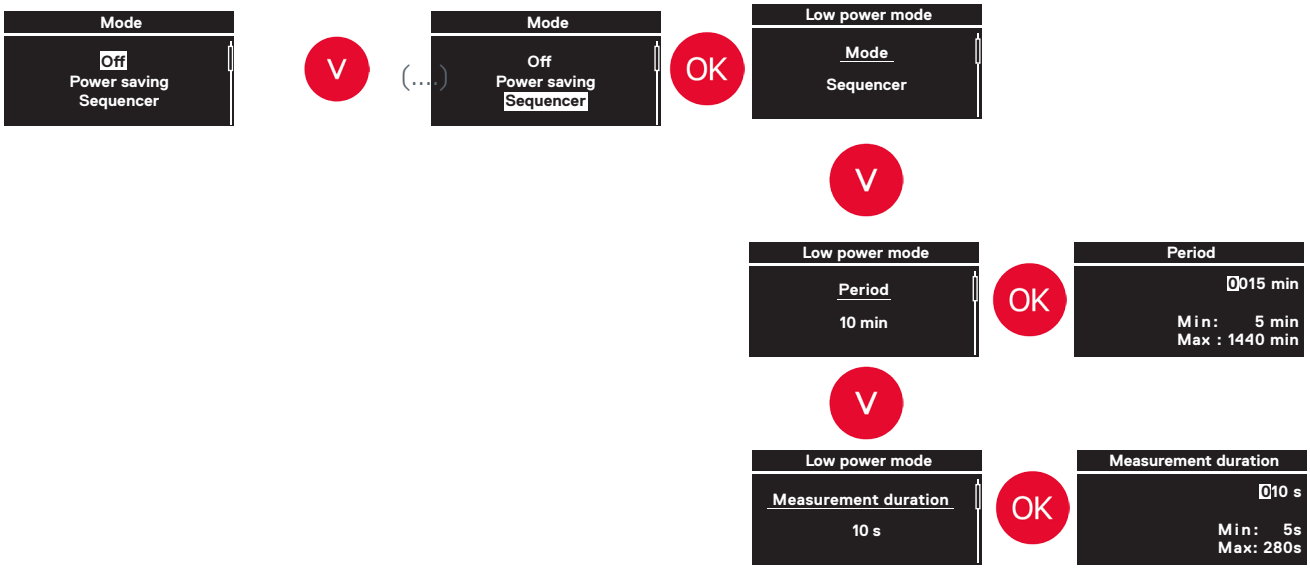
- OLED display turned off (switching on by pressing any keyor power button)
- 1 flow calculation per second (instead of 10 using standard mode)

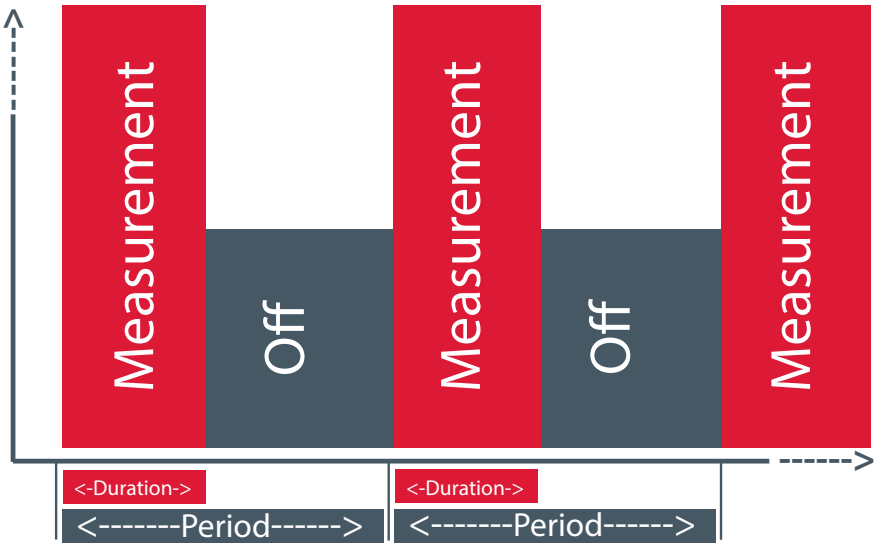
This mode is the basic way to get power safety and keeping good flow calcultaion resolution

Sequencer

- Mesurement duration indicates how long is each periode of active and continuous flow calculation
- Periode indicates how often the instrument wakes up

This mode allows the largest power safety option (depending on the settings)





Sequencer funtioning illustration

Software update procedure

In order to reach software updating menu, you need to:

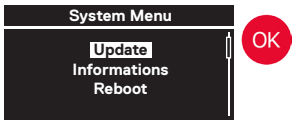
- Connect the power supply to the Minisonic II Portable in order to avoid low internal battery power level problem
- Reccord the update file on the root of an USB key
- ⚠ If there is more than 1 updating file on the root, the device will ask for only one
- Connect the USB key

USB key adapter

- Switch on the device
- ⚠ During ignition phase - ⏱ 3 secondes

- A counting down appears on the top right - ⏱ 5 secondes
- Enter the password before the countdown reaches 0 : ROL (Right-OK-Left)

- ⚠ If the code is incorrectly entered, the device normally starts - Switch it off and repeat the procedure
- In the «System Menu» Presse OK key to initiate the software updating



- Extract - ⏱ about 30 s
- Programming - ⏱ Up to 4 minutes
- Switch off the device - Press On/off button during 1 to 2 seconds
- Switch on the device - Press On/off button during 1 to 2 seconds
- ⚠ Warning: if the device gives no sign of life, this is normal.
- ⏱ Wait about 5 minutes for the device to restart with its new software version

If the device restarts immediately: Is there something wrong ?

- The device may already runs the good version
- The updating is a minor one (Spelling patches in one or more languages)

After 10 minutes without sign of life, the device does not restart, what have I got to do ?

Run the restore procedure :

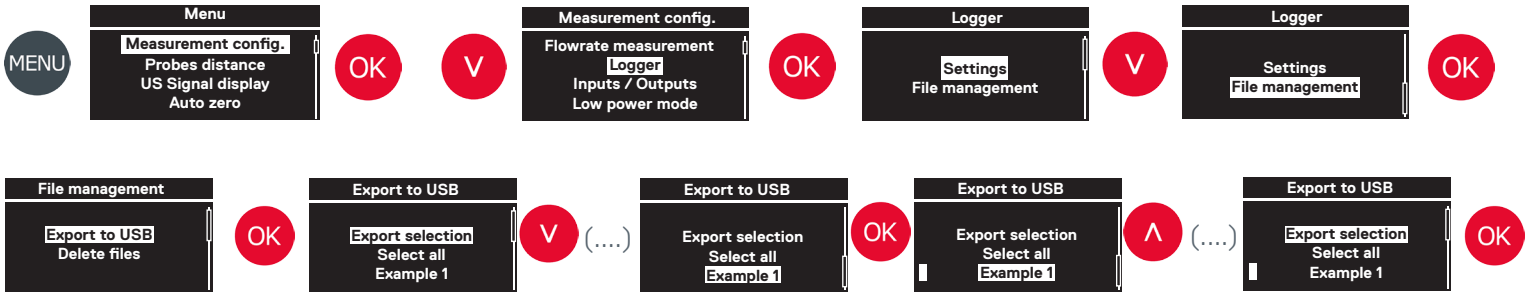
- Start by pressing for 15s the On/Off button to force the switch off
- Switch on the device - Press On/off button during 1 to 2 seconds
- The device gives no sign of life, this is normal.
- Wait for up to 5 minutes for the device restart
  - Either with the new version
  - Or with the «Golden» version. In that case, please proceed the complete procedure again

  (Golden version : back-up version of the Minisonic II.)

Logger / Data upload and exploitation

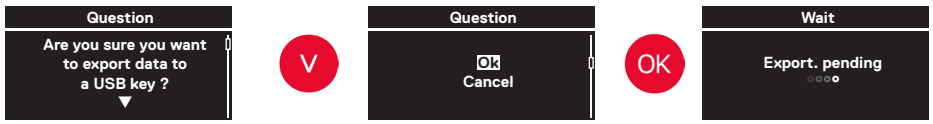
The goal of this procedure is to show:

- The path to data upload menu
- Procedure for reccord file selection
- Physical file upload on USB drive
- MS Excel file import and file formating



In Export to USB submenu, choose and tag the file(s) to be exported. Export selection

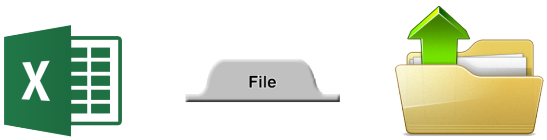
Connect the USB drive to the **Minisonoc II**, Confirm transfert.



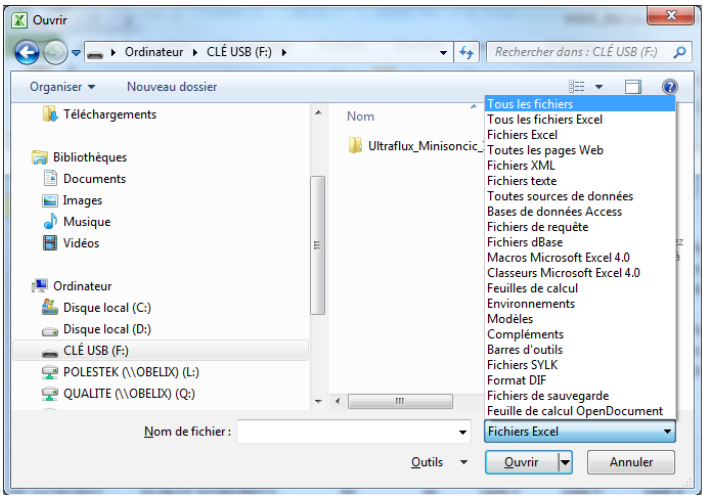
When transfert completed, file tree appears as follow:

USB Drive	USB Drive
Ultraflux_Minisoncic_II_P_SN00017	File indicates the serial number of the instrument (ex: SN00017)
Logger_Example 1	File indicate reccord name (ex: Example 1)
Example 1_2017.11.22_23h38_config.txt	Text file including instrument settings during the reccord
Example 1_2017.11.22_23h38.ind001.log	Spreadsheet file including data reccord

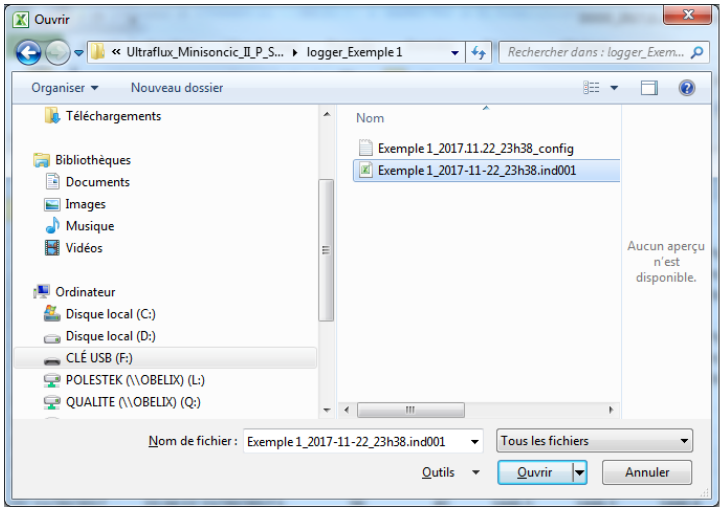
Microsoft-Excel import and spreadsheet file formating



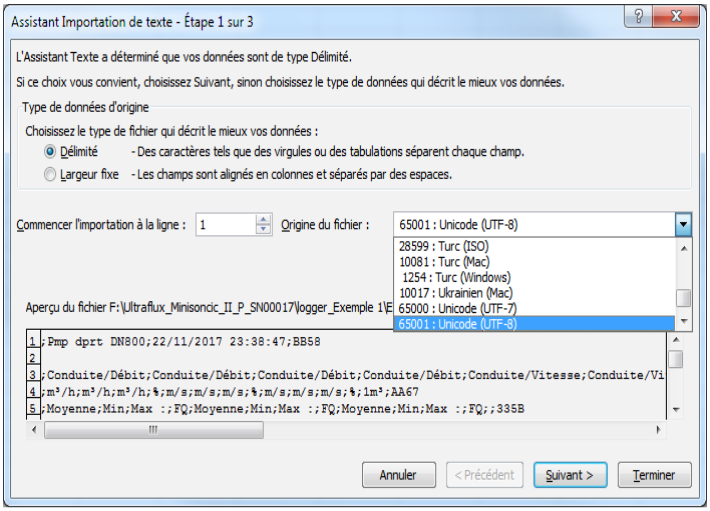
Open Microsoft Excel / File / Open



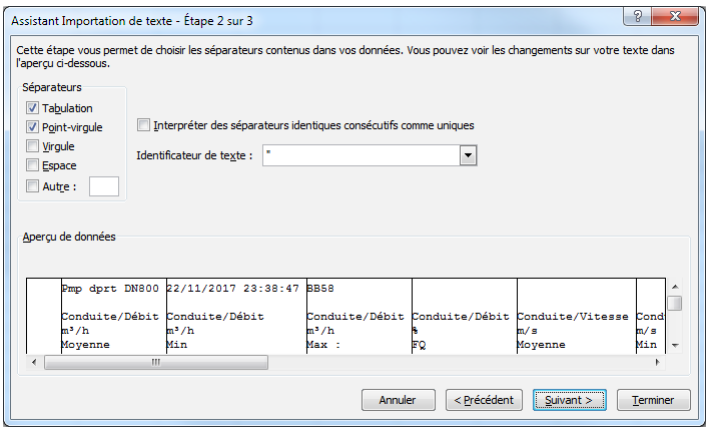
Select «All files» (all kind of files)



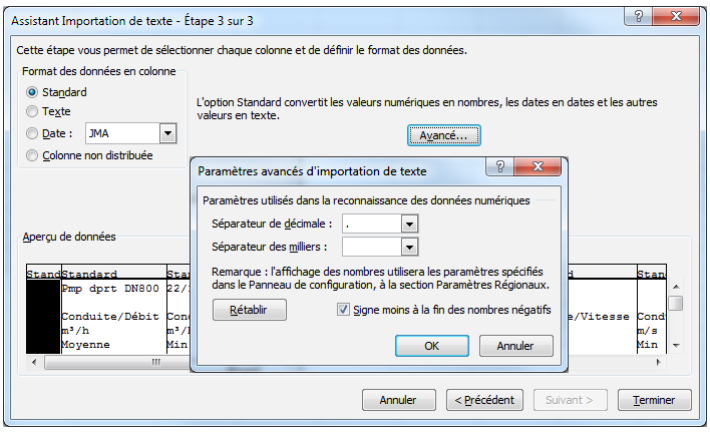
Select the data spreadsheet file



Choose UTF-8 as origin type of file



Choose «;» as column separator



In advanced option, choose «.» as decimal separator

How to adjust the gain of the measurement signal

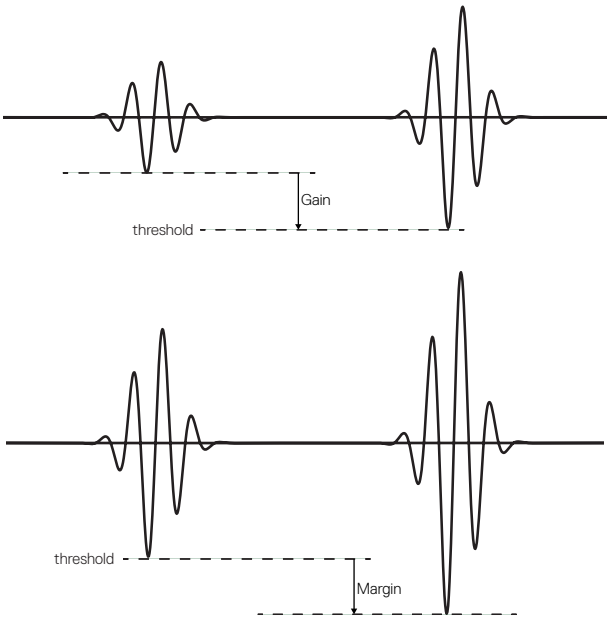
The details in this chapter correspond to the EXPERT mode of the parameter level menu.

Preamble

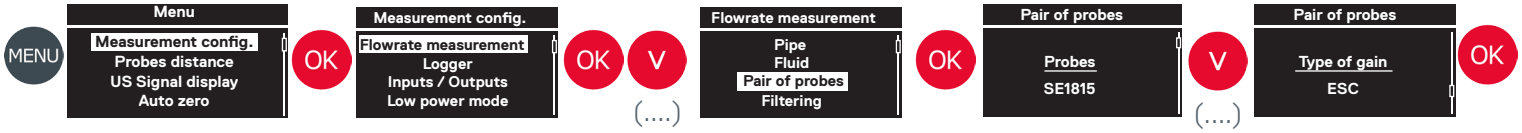
The Minisonic II can work on the positive or negative polarity of the signal.

The Minisonic II determines at each reception of the measurement signal, the gain to be applied so that the peak of this signal reaches the detection threshold (example presented on a negative polarity).

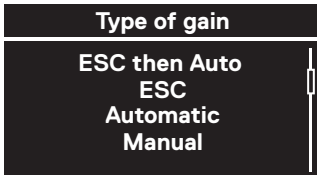
To this Gain must be added an additional gain, called Margin, allowing the signal peak to be well beyond the threshold.



Path to setting the gain type



The Minisonic II offers several modes of Gain and Margin adjustment



ESC then Auto

Switching from the ESC mode (see below) to make the first measurement then definitively in Automatic mode (see below) for the rest. This mode is to be preferred on an installation without strong modifications of the conditions of the application, for measurements in the long term.

ESC (Echo Shape Control)

This mode chooses the best Gain to apply to the signal as well as the best Margin. This mode is to be preferred in the card of the use of a portable flowmeter which makes punctual measurements on different applications.

This mode requires a few seconds of signal analysis before indicating the flow rate value.

In case of loss of signal due to a disturbance of the measurement conditions (passage of a train of bubbles ...) the device starts a new ESC.

Automatic

In this mode, only the Gain is determined automatically, the Margin must be indicated manually. The manual setting of this Margin, if it is too important, implies that the flow measurement can be done on a peak located in the middle of the signal. But the measure is better if it is performed on the first alterannce. This mode is preferred on an installation without strong modifications of the conditions of the application, for long-term measurements.

Manual

The values of Gain and Margin are determined by the user.

This mode is useful in the case where the disturbances of the signal make the gain too unstable for an automatic search.

Ultraflux

Minisonic II

Portable