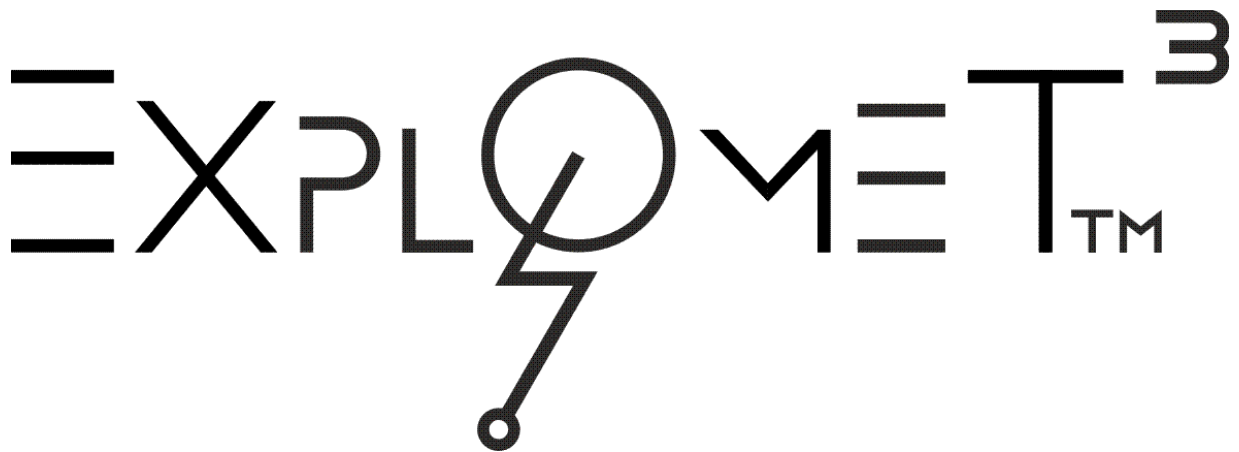




User's manual

Explomet 3

Velocity Of Detonation Measuring Instrument

DESIGNED & MANUFACTURED BY

Kontinitro

Swiss manufacturer of detonation velocity measuring
instruments since 1936

Table of Contents

BATTERY	3
USING THE EXPLOMET 3.....	4
MAIN MENU	5
FIRST TIME SETUP.....	5
OPERATIONS FOR TIME ONLY	7
OPERATIONS FOR VELOCITY AND TIME	8
MISSING MEASURE.....	11
PRECAUTIONS OF USE	11
SD CARD MANAGEMENT.....	12
DATA TRACEABILITY	13
CALIBRATION	14
MAINTENANCE	15
SPECIFICATIONS.....	16
APPENDIX	17

BATTERY

Important to know before you start using your Explomet 3

It is necessary to charge the Explomet 3 after each day of use in order to avoid excessive discharge of the battery which could damage it.

The instrument has an operating capacity of approximately 10 hours.

When the instrument is switched off, the battery has a capacity of several weeks.

Please observe the following information in the start menu of your device:

Check battery, Voltage should be >5.8V

Charge the battery after each day of use.

You can check the voltage of your battery at any time by pressing the button on the bottom left of your control panel for 2 seconds.

Max: 6.7[V]

Min: 5.8 [V]

Never go below 5.8 [V]

you risk not being able to turn on your device!

USING THE EXPLOMET 3

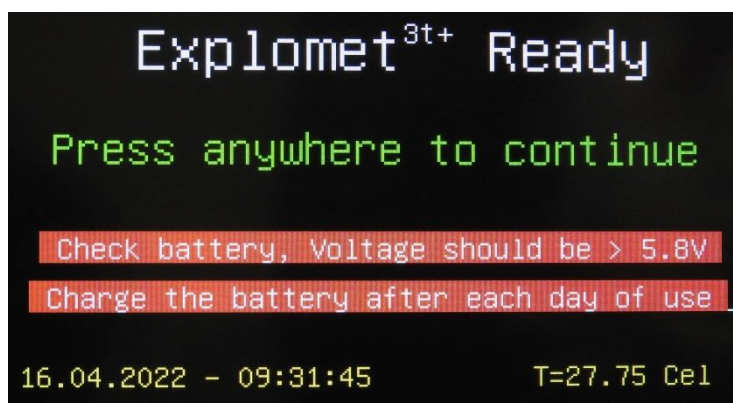
Make sure your SD card is inserted



Or ...



TURN ON THE EXPLOMET 3™

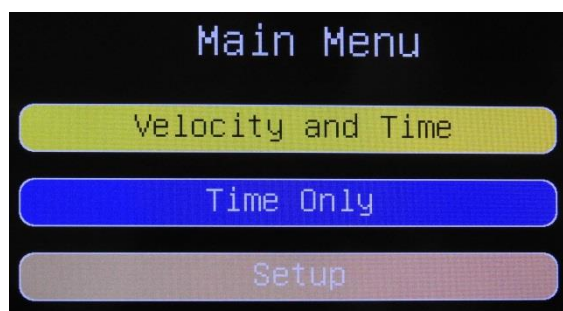


Start menu with date, time (24:00), internal temperature of the instrument (T=).

The Explomet 3 is controlled by a touch screen. Touch the screen to access the main menu.

Touch the screen

MAIN MENU



FIRST TIME SETUP

To start using the Explomet 3, you must first set your preferred language, time and current date.



Press **Select** the desired language

The instrument will restart, go back to the configuration to set the time.

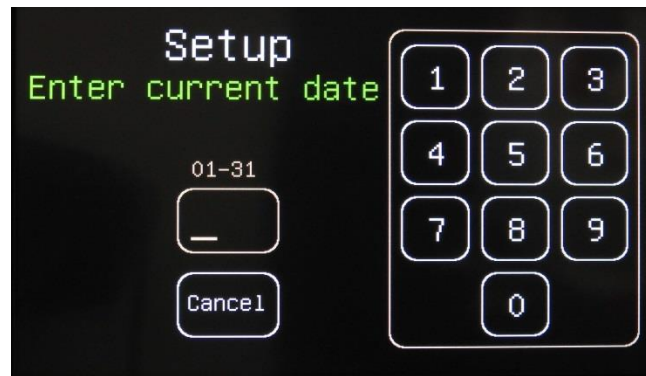
Press **Set Time**



Enter the time in 24 hour format (00 to 24), for example 9h25m36s(9AM25m36s), you must press 0 9 then 2 5 on the next page and 3 6 on the last page.

The instrument will restart, go back to the configuration to set the date.

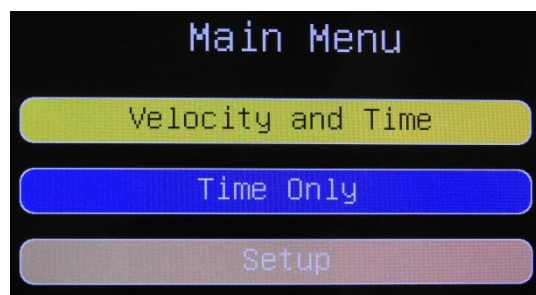
Press **Set Date**



Enter the day in the format 01 to 31, then the month 01 to 12 and the year 19 to 99 (2019 to 2099).

The instrument will restart.

Your instrument is now ready to acquire data.



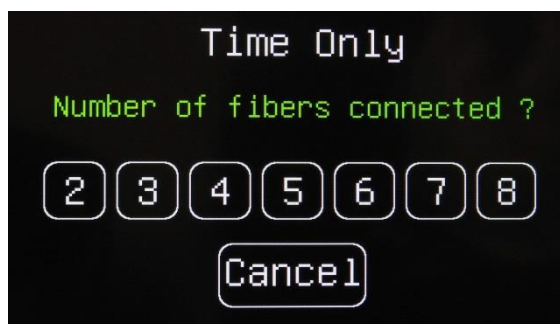
You have the choice between 2 measurement modes, "Velocity and Time" or "Time Only"

Basically, there is no big difference, except that in " Velocity and time " mode, you have the result directly in m/s.

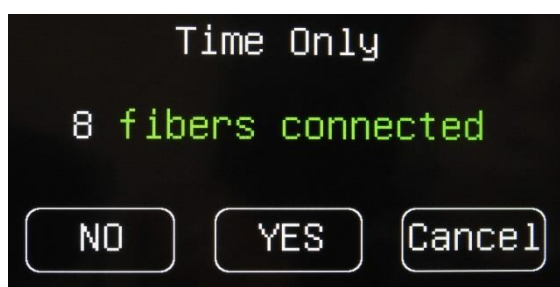
This means that you need to know the exact distances between the fibers in order to insert them into the explomet.

OPERATIONS FOR TIME ONLY

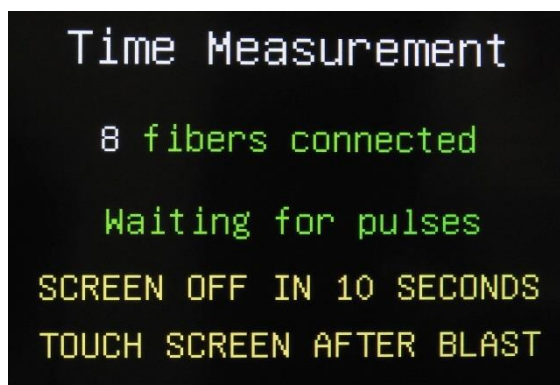
Press **Time Only**



Select the number of connected fibers (8 in our example)



Press YES to accept NO if you made a mistake, or Cancel to go back to Main Menu



As you can read on the screen, the screen turns off after 10 seconds, which allows us to save batteries.

When you press OK in the previous screen. the LED lights up.

When the display turns off, the LED starts flashing to indicate that the instrument is waiting for a measurement.

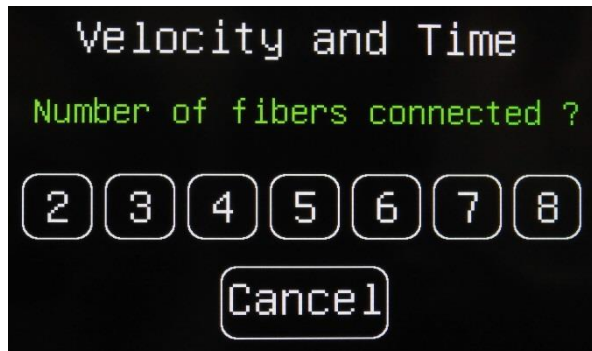
When the instrument receives the first pulse, the LED turns off.

You must wait at least 20 seconds after the LED has gone out to touch the screen, which will then turn on again and display the results.

In the meantime, the results have been stored in 2 files on your SD card. (explanations in the SD CARD section)

OPERATIONS FOR VELOCITY AND TIME

Press **Velocity and time**



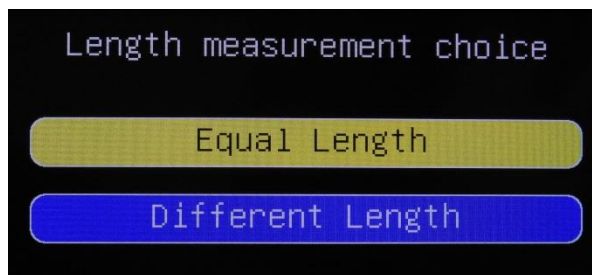
Velocity and Time

Number of fibers connected ?

2 3 4 5 6 7 8

Cancel

Select the number of connected fibers (6 in our example)



Length measurement choice

Equal Length

Different Length

You have 2 choices, all your fibers have the same spacing between them or the spacings are different.
We will start with the same spacing.

EQUAL LENGTH



Velocity and Time

Enter length in mm

Unique length

Max 9999

456_

Cancel OK

1 2 3

4 5 6

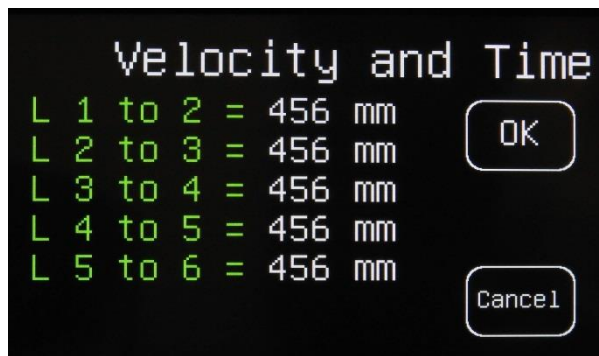
7 8 9

0

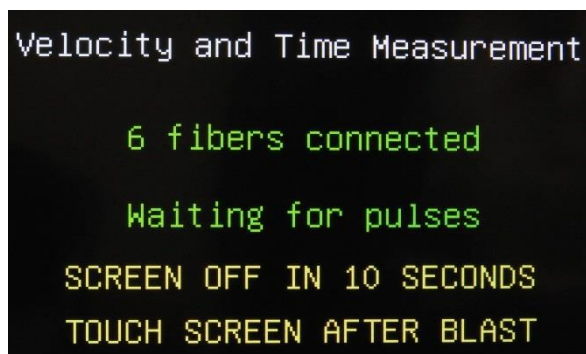
Enter the distance between 2 fibers.

This value must be between 1 and 9999 mm. (456mm in our example)

Press OK



Press OK or Cancel to restart from the beginning.



As you can read on the screen, the screen turns off after 10 seconds, which allows us to save batteries.

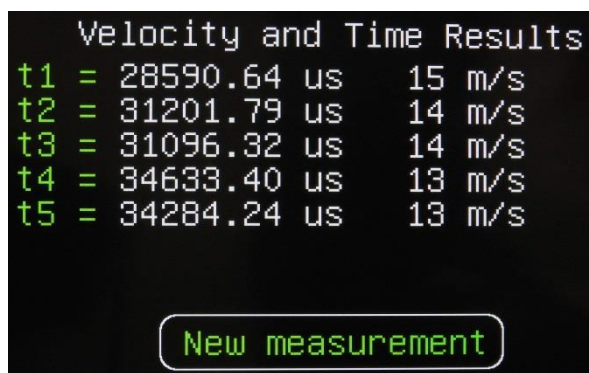
When you press OK in the previous screen, the LED lights up.

When the display turns off, the LED starts flashing to indicate that the instrument is waiting for a measurement.

When the instrument receives the first pulse, the LED turns off.

You must wait at least 20 seconds after the LED has gone out to touch the screen, which will then turn on again and display the results.

In the meantime, the results have been stored in 2 files on your SD card. (explanations in the SD CARD section)

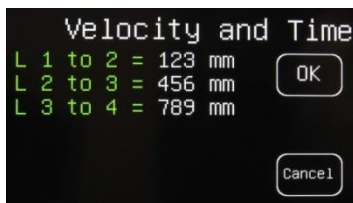


DIFFERENT LENGTH

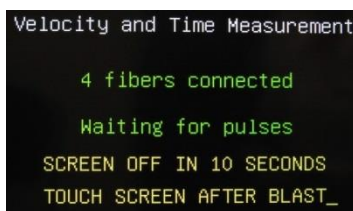
4 fibers selected for our example



Enter the spacing between each fiber independently as in our example



Press OK or Cancel to restart from the beginning.



As you can read on the screen, the screen will turn off after 10 seconds, this allows us to save the batteries.

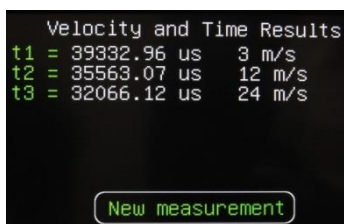
When you press OK in the previous screen. the LED lights up.

When the screen turns off, the LED starts flashing to tell you that the instrument is waiting for a measurement.

When the instrument receives the first pulse, the LED turns off.

You must wait at least 20 seconds after the LED has gone out to touch the screen, which will then turn on again and display the results.

In the meantime, the results have been stored in 2 files on your SD card. (explanations in the SD CARD section)

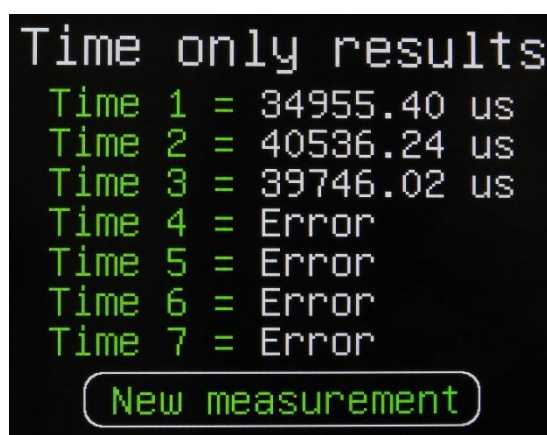


MISSING MEASURE

During an explosion, as you know, many unexpected things can happen. The malfunction of one or more fibers can unfortunately occur.

In this case, the device reports an "Error" result.

As in the picture below (waiting for 8 impulses, only 4 received)



PRECAUTIONS OF USE

Once the display has gone out and the LED is flashing, you should close the case to prevent dust from entering the instrument.

This does not affect the operation of the device.

The fibers must be connected before programming the measurement and the unused connectors must be plugged with the supplied plugs. This is to avoid error due to unwanted illumination of unused connectors (sunlight, flashlight, etc.).

When you open the box after the test, just touch the screen to see the results.

SD CARD MANAGEMENT

READING DATA

Insert your SD card directly into your computer or using the USB-SD card reader.

All your measurements made with the Explomet 3 are systematically saved on the SD card in 2 files.

The file name is established in this way (example):

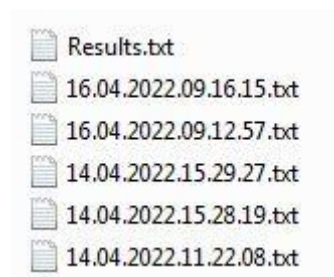
14.04.2022.15.29.27.txt // Means: 14 april 2022 15h29m27s for each measurement

And

Results.txt where all results are stored incrementally in the same file (time could differ for some seconds in the 2 files)

These files (.txt) can be read by most programs (Word, Excel, Notepad, Open Office, etc.) on operating systems, MacOS, Windows, Linux, Android ...

Example Files on SDCard



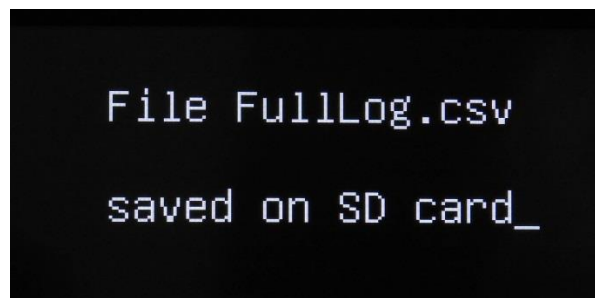
DATA TRACEABILITY

For traceability purpose you can find all the measurements acquired with your instrument since its commissioning (including the quality control (QC test) tests carried out at the factory)

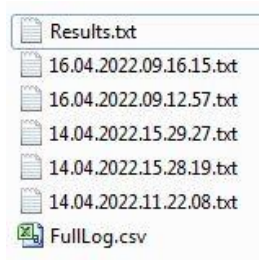
This function is also very useful if you accidentally lose or erase your SD card.

To retrieve this file (called FullLog.csv), you have to go to the setup menu and choose Data Recovery, then YES.

The FullLog.csv file is then copied to your SD card and can be opened with a text editor or Excel.



Example Files on SDCard



Reading of FullLog.csv in Excel (Data can be analyzed in Excel in columns)

QC test PASS Succesfully	

Result for velocity time	14.04.2022 / 11:01:32
Number of connected fibers:	8
Length; ;Time; ;Speed;	
658; mm;335544.31; us;1; m/s	
658; mm;335544.31; us;1; m/s	
658; mm;335544.31; us;1; m/s	
658; mm;335544.31; us;1; m/s	
658; mm;335544.31; us;1; m/s	
658; mm;335544.31; us;1; m/s	
658; mm;335544.31; us;1; m/s	
658; mm;335544.31; us;1; m/s	
Result for velocity time	14.04.2022 / 11:02:26
Number of connected fibers:	8
Length; ;Time; ;Speed;	
9999; mm;335544.31; us;29; m/s	
9999; mm;335544.31; us;29; m/s	
9999; mm;335544.31; us;29; m/s	
9999; mm;335544.31; us;29; m/s	

All your data are coming after the QC test for ever

CALIBRATION

The Explomet 3 has a quartz corrected for temperature and voltage. It is checked during the QC test and must be within specifications ($\pm 0.01\mu\text{s}$)

No calibration is necessary afterwards unless your internal requirements specify it.

The following tests were done by Factory QC			

Result for time only 14.04.2022 / 10:59:56			
Number of connected fibers: 8			
335544.31; us			
335544.31; us			
335544.31; us			
335544.31; us			
335544.31; us			
335544.31; us			
335544.31; us			
Result for time only 14.04.2022 / 11:00:38			
Number of connected fibers: 8			
0.08; us			
0.09; us			
0.08; us			
0.08; us			
0.08; us			
0.08; us			
0.08; us			

QC test PASS Succesfully			

MAINTENANCE

As the Explomet 3 uses microelectronic technology, do not expose it to humidity, dust and preserve it from shocks.

When the instrument is used frequently in dusty atmospheres, it is necessary to clean the fiber optic receivers from time to time by blowing clean air through the fiber connectors.

You can also do this for the housing of the SDCARD.

When unused, be sure to close the optical receptors with the supplied grey plastic caps.

SPECIFICATIONS

Measurement range:

Distance between two optical fibers on the explosive: from 1 mm to 9999 mm
Detonating velocity calculation up to 300'000'000 m/s (theoretical)
Time interval measurement: 20 nanoseconds to 20 seconds

Accuracy:

+/- 10 nanoseconds [ns]

Timers:

7 synchronous timers(32bits)

Operating temperature:

-30 to 80°C

Storage capacity:

SDCard of 32 Gbytes maximum capacity
Depending on the inserted SD card. (for example 10,000 data acquired in speed and time measurement = approximately 2.5 kbyte)

Fiber optic connectors:

HFBR-4501Z or HFBR-4511Z from Broadcom/Avago or compatible

Autonomy:

Operating capacity of 10 hours
Provided by 2 x AGM sealed battery 6V/5Ah

Charging

Internal charging device
Input: 100-240 V / AC 50/60Hz
Full batteries charging time: 10 hours

Dimension:

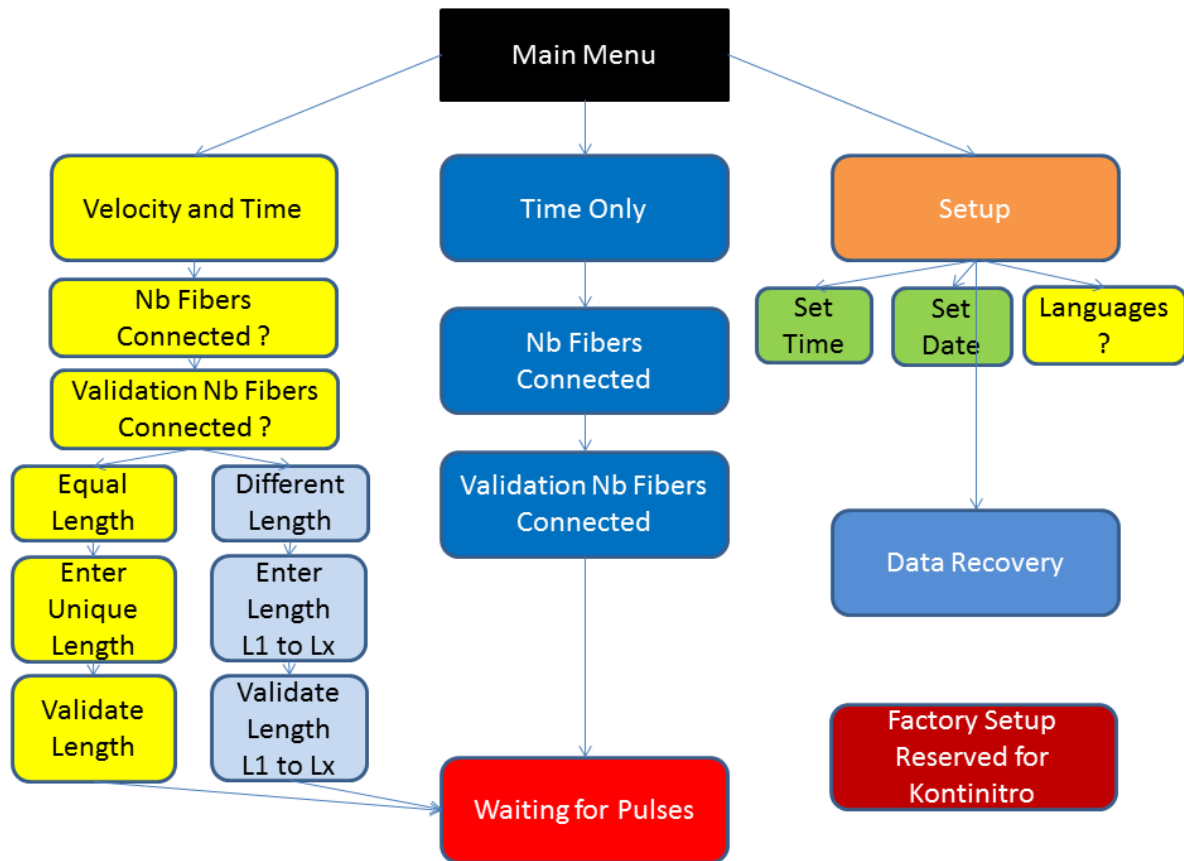
Width 27 cm // 10.63 inch
Length 25 cm // 9.84 inch
Height 18 cm // 7.09 inch

Weight:

About 4.5 kg // 9.9 lbs

APPENDIX

Flowchart summarizing the EXPLOMET3 menus



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RESULTS