



# MNEMO

USER GUIDE V1.5

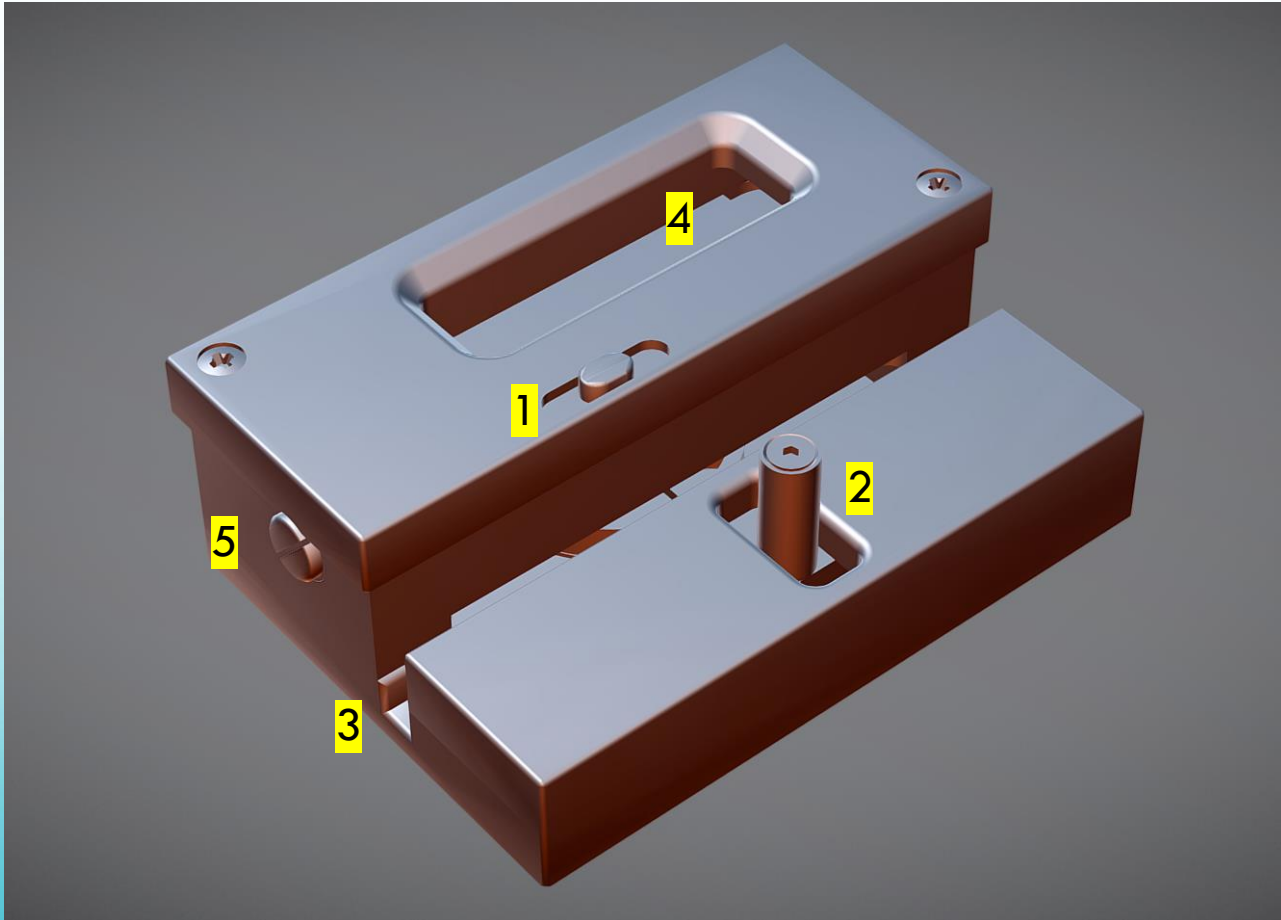
SEBASTIEN KISTER- [ARIANESLINE.COM](http://ARIANESLINE.COM)

6/18/2017

# UPDATES

- Revision 1.5 for firmware 1.7f-34
  - Added Basic / Wheel and Basic / Knot mode.
  - Optimized Azimut measurement for high inclination lines (  $>45^\circ$  ) ( see page 23 )
  - Precision of line measurement is down to  $\pm 1.8\text{cm}$
  - LCD Contrast is adjustable in LCD option.
  - Slider sensibility is configurable.
  - Multiple Reboot triggers update.

Added TIPS AND TRICKS section to this manual.



## DESCRIPTION

1. Slider Control
2. Pressure plate lever
3. Line slot
4. Display/Color Indicator
5. USB connection

# SWITCHING MNEMO ON

- Move the slider to the left and hold it there for 8s maximum and the screen will turn green displaying : [MNEMO]1.7f-XX>OK<
- When this appears it means MNemo has started and all the sensors are working properly.
- Move again the slider to the left and you'll be in the main menu.

# NAVIGATING THE MENU

- Each menu will have an active or selected item that will be surrounded by >....< ( Example : **>BASIC< FULL OPTIONS EXIT**)
- Moving the slider to the right is shifting the selected item to the right. In our example, a slide right results in : **BASIC FULL >OPTIONS< EXIT**
- Moving the slider to the left is equivalent to the “Enter” key of your keyboard. It selects the current item or starts the action highlighted. If the example if we want to go in the “Options” section we slide to the left.

# MAIN MENU

- You will notice that the second line of the menu is displaying a stream of information:

**26/03 11:26 27.6°C** Day/Month | Hour:Minute | Water Temperature

**3.7V (FW)(m) M:0%** Battery Voltage | Type of water | Unit | Memory usage

# CALIBRATING THE UNIT

- Before starting a survey MNemo's sensors need to be calibrated and certain parameters need to be adjusted
  1. Setting the units used by MNemo ( Meter or feet)
  2. Selecting the type of water you are diving in ( Fresh or Salt )
  3. Adjusting the surface pressure
  4. Adjusting the line measurement factor
  5. Calibrating the Compass



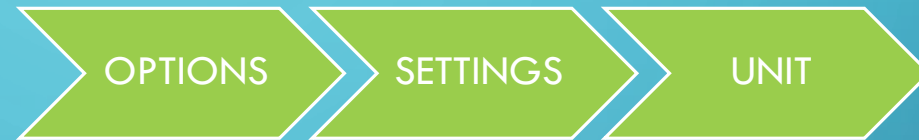
# CALIBRATING THE UNIT

- All the settings and calibration are kept in memory when you turn MNemo off except the calibration of the compass that has to be done for each session.
- Therefore we recommend calibrating the compass at the beginning of the dive whenever possible in the water, especially if the temperature difference between air and water is high.



# SETTINGS THE UNITS

- From the main menu navigate to



- Select either *Metric* ( using meter and °C) or *Imperial* ( using feet and °F)

# SELECTING THE TYPE OF WATER

- From the main menu navigate to:



- Choose between fresh and salt water.


# ADJUSTING THE SURFACE PRESSURE

- From the main menu navigate to:



- The surface pressure will be automatically adjusted.
- Obviously ... DO NOT ADJUST SURFACE PRESSURE IN THE WATER

# ADJUSTING THE LINE MEASUREMENT FACTOR

- This is set when we assemble and calibrate the device. If you notice a difference in the distance displayed by Mnemo and the real distance of the line you can correct this factor.
- From the main menu navigate to 

```
graph LR; A[OPTIONS] --> B[SETTINGS]; B --> C[SENSOR]; C --> D[DISTANCE ADJUST]
```
- Choose + or – to change the distance factor and validate the measurement.

# CALIBRATING THE COMPASS

- This is by far the most important calibration of MNemo. It has to be done each time you start the unit. You can't forget it as MNemo won't start a survey if the compass is not calibrated.
- You can start the compass calibration in two different ways:

- From the main Menu go to

or

or



# CALIBRATING THE COMPASS

- The display will turn red until the compass is calibrated.
- One or all of the following messages will appear on the display:  
"Keep device Stable", "Place on each side" (5s on each) and "Move randomly"
- Follow the on-screen instructions

# CALIBRATING THE COMPASS

- To have a precise and correct calibration it is CRUCIAL to be far away from any magnetic or electromagnetic disturbance, in particular :
  - Scooters, steel tanks, compasses, dive computers, dive light canisters
  - But also:
    - Electric line, cars, any electric motor etc ...
- I can't insist enough on the fact that there's NO WAY to get a precise survey without a precise and correct calibration. For example, in our office we can't calibrate the compass on my work desk, which has a metallic structure, and two computers on it. The average calibration time is 45s, but anything below 2min is ok. If the calibration is not happening after 2min, turn MNemo off and on again and restart the calibration.
- The compass has its own processor that is in charge of the calibration, if the calibration is not at 100%, the device will refuse to start avoiding thereby any biased data collection.



# SURVEY MODE

- **FULL** : This is one is easy to start with and offers the full range of options. It requires to have the possibility to read the text on the LCD. It can only be used to a depth of approximately 50m. *(The display will dim at greater depth making the reading of the text more and more difficult. This limit will depend on your device and should be tested)*
- **BASIC** : This mode allows less options but it does not require from you to read the display, just see the background color. It is the mandatory mode for survey over 50m depth. WITH A BIT OF PRACTICE THIS IS THE MOST EFFICIENT MODE TO USE IN ANY CONDITION.

# STARTING A SURVEY – FULL MODE - NAMING THE SECTION

- Once the compass is calibrated from the main menu select
- The screen will display options similar to:



>A< A 1 OK BACK

In this menu you can choose the name of the section you are surveying. Section in this case means the section of the survey which can differ from the section of the cave you are working in.

In our example the section is called AA1. You can navigate from one letter to the other moving the slider to the right and change the current letter by moving the slider to the left. Once done select OK and validate (slider to the left).

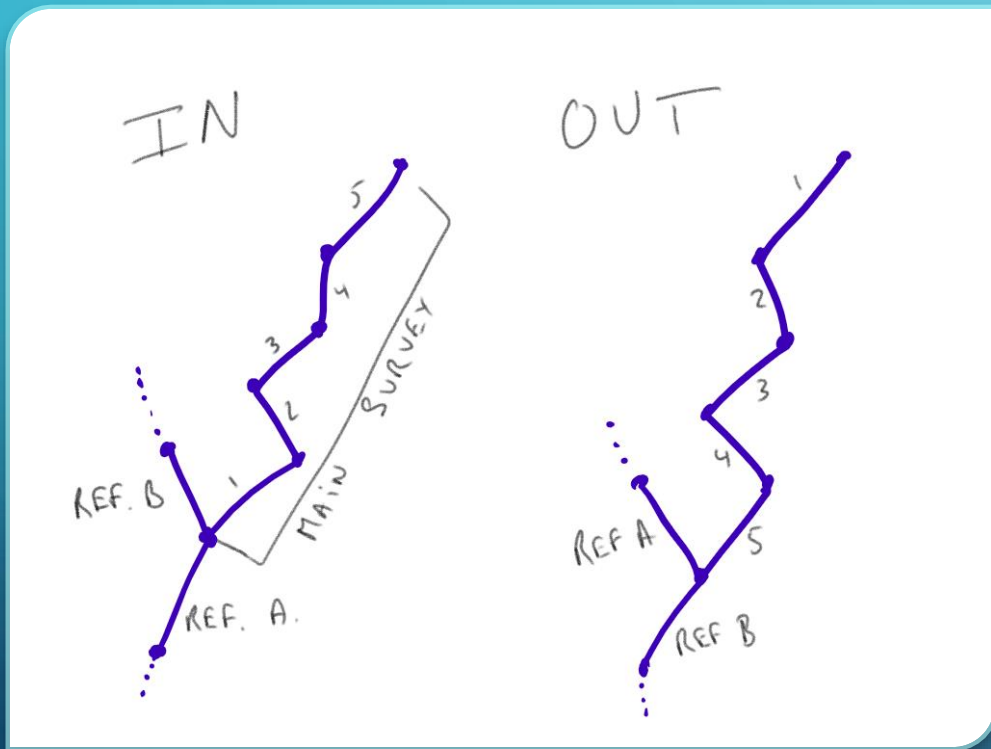
# STARTING A SURVEY

## CHOOSING THE DIRECTION

- The menu will display two options, select which direction you are surveying, IN or OUT.
- If you use IN survey you'll be offered the possibility to survey 2 reference shots before you start your main survey. In OUT mode the reference can be taken after the main survey is done.

# STARTING A SURVEY

## CHOOSING THE DIRECTION



- You can also decide to ignore the reference shots by selecting SKIP in the menu.
- The schematic on the left explains the survey numeration depending on the direction of the survey.

# SURVEYING A SHOT


- Once all is set, here comes the easy part !
- To survey a shot, pull the pressure plate lever, insert the line into the slot, release the lever, making sure the line is not trapped. Slide the device to the beginning of the shot ( Entry Station)

- Select



- The display will turn RED. At that point the device is waiting to be stabilized ( See on page 23 for details) to measure the azimuth. Don't hold the device in your hand, rather support it from beneath so it can use the tension in the line to self align and take the most accurate measurement possible.

# SURVEYING A SHOT

- The display turns blue or purple when the compass has taken the first azimuth. You can now move the device along the line all the way to the next station. The display will be flickering indicating that the wheel is spinning and measuring the length of the line. The device measures the line in both direction allowing you to compensate for big diameter tie-offs. If the line is too loose the length reading will be incorrect.
- When you reach the next station, select  STOP
- The display turns red waiting to stabilize and measure the second azimuth.

# SURVEYING A SHOT

- A message will appear, SHOT SAVED on green background and the screen will turn white again, meaning that you can move to the next shot.
- Repeat the operation ...
- Once you reached the last shot select  END
- This will save the section. You are back to the main menu ready to survey the next section !



# ABOUT STABILIZATION

- In which ever survey mode you use the Mnemo the stabilization phase is indicated by red background color.
- If during stabilization the red background starts flashing, that means the device is not flat enough ( ie. rolling too much on one side or the other ). In this case rotate the device around the line until the blinking stops, then stay stable and the measure will be taken.
- If the inclination of the line is lower the  $45^\circ$ , the rotation tolerance is quiet large ( about  $30^\circ$  on each side of the line)
- For line with high inclination ( typically in vertical sections of the cave), the tolerance has been extremely reduced ( only  $1^\circ$ ) allowing by the same to have a much more precise reading of the azimuth despite the high inclination. In such a case slowly turn the device until it is flat, otherwise the measure won't be taken. It may take a little bit of time ( 10s max) but the result is worth it.

# CANCELLING/RETAKING MEASURES

- If you want to retake a measure there are two options:
- Either you are still in reading mode ( BLUE/PURPLE background ), in this case just select BACK and you can retake the measure you were taking.
- You finished the measure ( WHITE background waiting for next measure), in this case you can select UNDO to erase the last saved measure and take it again.

# SURVEYING – BASIC/WHEEL MODE -

- Once the compass is calibrated from the main menu select
- You'll be asked to choose between WHEEL, KNOT or go back.
- WHEEL means you are using the line measurement capability of Mnemo
- KNOT means you'll be counting the knots on the line and transmitting manually the information to Mnemo . We'll see later how that works.
- Once confirmed your device enters BASIC survey mode. There will be nothing displayed on the screen, except the station number, and the length of the line in BASIC/KNOT mode, until you exit the mode ( It's a way of knowing you are in BASIC mode )
- You'll notice a flashing green light in BASIC/WHEEL mode or a flashing white light in BASIC/KNOT. That means the device is in STANDBY.



BASIC

# SURVEYING – BASIC/WHEEL MODE -

- From STANDBY mode, to start a section hold the slider left (approx. 3s), the screen turns WHITE, this indicates READY mode. By default in any BASIC survey mode all surveys are recorded IN and are named “BAS”. You can then later sort out the data on your favorite survey software.
- Clip the device on the line at the beginning of the first shot.
- Hold the slider left (approx. 1s) the background turns RED, you are in STABILIZE mode ( same as in Standard survey mode). Once stabilized, the device goes in READING mode, you can now move along the line, you’ll recognize the flickering BLUE/VIOLET you already had in Full survey mode indicating the wheel is measuring the line.

# SURVEYING – BASIC MODE -

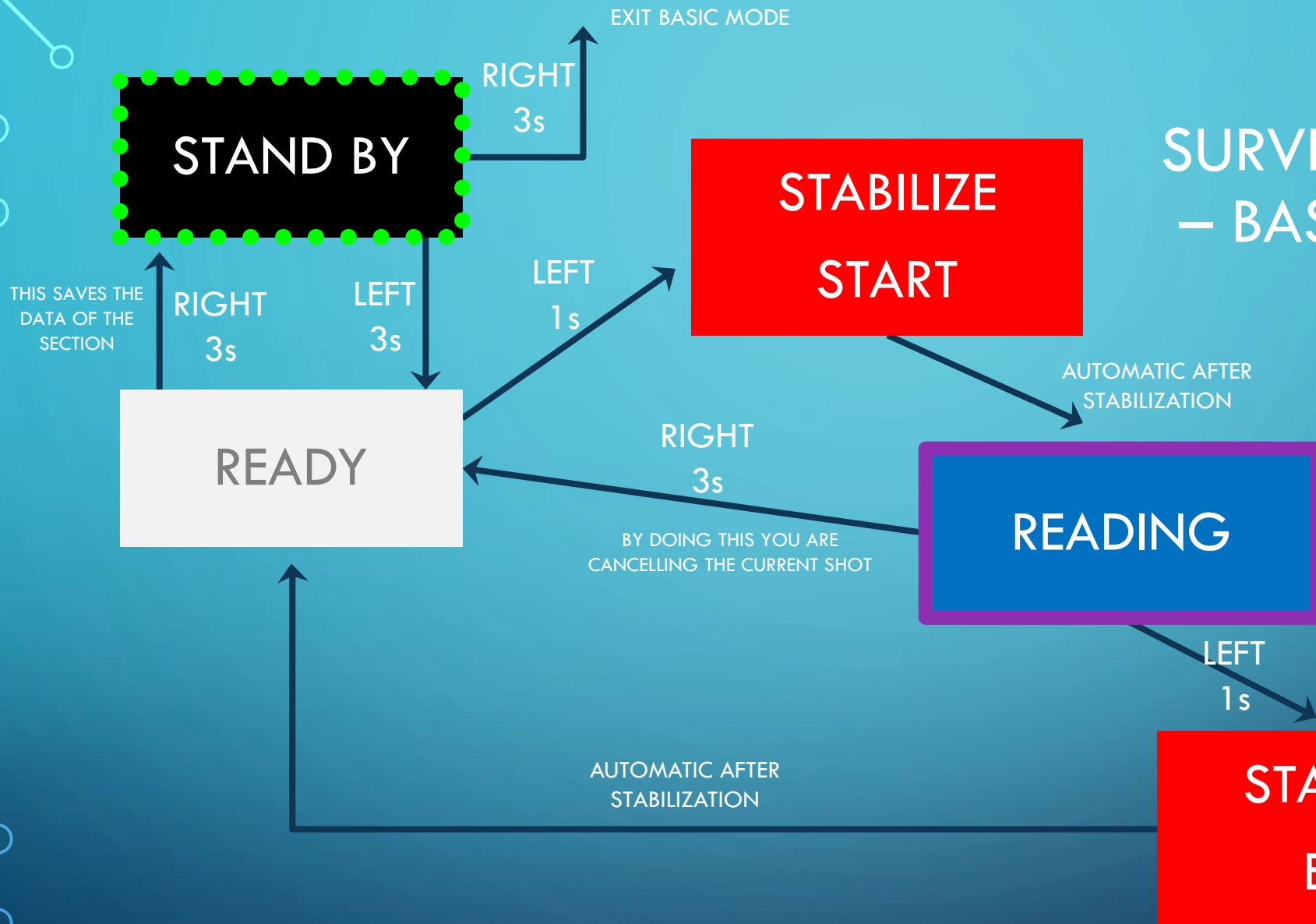
- Once you reach the end of the shot hold the slider left again (approx. 1s) the background turns RED, you are in STABILIZE mode. Once stabilized the background becomes white again, you are back in READY mode.
- You can repeat the operation for the following shots.
- Once you have finished the section, when you are in READY mode, to save the section move the cursor to the right during 3s. This will save the data and put the device back in STANDBY mode ( Blinking GREEN or WHITE).
- To exit BASIC survey mode, from the STANDBY mode, hold the cursor to the right during 3s.

# SURVEYING – BASIC /KNOT MODE -

- This mode has been suggested by a MNemo user who wanted to use the Mnemo with a scooter, preferring to count the knot and indicate manually the distance.
- In BASIC/KNOT mode you'll only have to clip the device on the line at the beginning and at the end of the each shot, thereby taking measures of depth and azimuth.
- In between the beginning and end, you'll increase the length by giving short impulsion left or right to the slider.
- In Imperial mode : Short LEFT = +10ft      Short RIGHT = +1 ft
- In Metric mode : Short LEFT = +5m      Short RIGHT = +0.5m
- The rest of the operation is the same as in BASIC/WHEEL mode.



# SURVEYING – BASIC MODE –





# SURVEYING –THE BIG PICTURE-

- An important thing to remember is that once you are using MNemo it is not necessary to read the display for each operation, the color will indicate the operational phase. Familiarity with MNemo allows your focus to be on the safety of your dive and a global cave/environment awareness. BASIC mode makes it even easier, we recommend that mode for all your surveys.
- With a bit of practice you can survey at the same speed you'd normally swim in a cave (15-20m/min).

# TRANSFERRING DATA TO YOUR PC/MAC

## - INSTALLING MNEMO DRIVER –

- THIS DRIVER IS ONLY REQUIRED FOR WINDOWS PC.
- Download the software on <http://www.arianesline.com> in the Download section choosing the driver corresponding to the windows version you are using (either 32 or 64bits)
- Expand the folder and launch McphCdcDriverInstallationTool.exe

# TRANSFERRING DATA TO YOUR PC/MAC

## - INSTALLING MNEMOBRIDGE -

- To install MNemoBridge download the software on <http://www.arianesline.com> in the Download section.

(It requires JAVA to run the software, you can download it at <http://www.java.com> )

Expand the file you downloaded and launch MNemoBridge.jar to start the app.

# TRANSFERRING DATA TO YOUR PC/MAC

## - CONNECTING MNEMO TO YOUR COMPUTER-

- Unscrew the plug of the connector on the MNemo. Using a coin of the appropriate size is the easiest way.
- Carefully place the plug in a clean and smooth container. If the plug is scratched or squeezed the connector will no longer be water tight.
- Connect the USB cable to the device and then to your computer. When connecting the cable insert gently the connector turning it in the appropriate direction. No need to tighten it too much.
- Turn on MNemo. At that point your computer should have recognized the device.

# TRANSFERRING DATA TO YOUR PC/MAC

## - TRANSFER—

- Launch MNemoBridge.jar to start the application.
- If “NOT CONNECTED” appears click on refresh. Make sure Mnemo is connected and turned on.
- Expand the “Download Data” and press the read button. Follow instructions on screen.
- MnemoBridge will save the data on the device in an Excel sheet. You can then copy-paste it in your favorite mapping software.

# ERASING MEMORY

- Mnemo can save around 5000 measures. You can erase the memory by going

to



- This operation **CAN NOT** be undone.

# LCD BRIGHTNESS / BATTERY SAVER

- You can adjust the LCD brightness by going to :



- You can toggle the EcoMode in the same menu ( It is activated by default and it is the recommended setting). In EcoMode the screen background light will dim after 8min. The device will turn off after 8H.



# TIPS AND TRICKS

## **-Wheel jamming:**

This is of course always a possibility with old/dirty line and the main contributing factor will be the lack or little tension of that line . If you notice the wheel is not spinning first check if the line has enough tension and if possible adding an extra wrap on a tie off to increase the tension often solves the problem.

Otherwise a way of unblocking the wheel is to hold the line in a hand, increase the tension and then swiftly roll back and forth the mnemo to clean the wheel, that should do the trick probably in 90% of the cases. Of course after that you'll have to resurvey that particular shot.

## **-Obstacles on the line:**

It is important to know that the device measures distance whether you move it forward or backward. This is done intentionally. In case you have an obstacle on the line (thick knot, arrow etc .. ) , roll the mnemo all the way to the obstacle, then back the length of the obstacle plus the size of the Mnemo. Unclip it from the line (do not stop the survey or add a station) and clip it on again after the obstacle. Resume rolling the device until you reached the next station.

Like this there is no loss of time to rearrange the line.

# TIPS AND TRICKS

## **-Compensation for thick tie wraps:**

You can compensate the loss in measurement of the round part of a large tie wrap by rolling back the device the estimated distance that is missing.

## **-Display or not display :**

We recommend all user of Mnemo to get familiar enough with the device to use only the colors of the screen and not read the menu at each station. This will increase the smoothness of the process and allows them to focus on stabilizing and clipping on and off the device.

## **-Opening the pressure plate (gate)**

If you are using the strong central spring and have difficulty manipulation the pressure plate, brute force WON'T help. Hold the white lever between thumb and index, apply a rotational force forward and THEN pull backward. Although this configuration is hard to operate it is also the one that offers the safest grip on the line

## **-Organizing work, multiple sections**

I personally call all my section AA1 or use BASIC mode. In most cases I can remember what I survey and in which order. In more complex scenario you can either take the time to change the name of the section or write on an slate complementary information.

# MAINTENANCE

- DO NOT LET THE BATTERY DRAIN COMPLETELY. Put it on charge ( leave connected to your computer or other USB charger) once per month even if you don't use the device.
- After each use thoroughly wash MNemo with fresh water, do not use any other chemical product. Ideally have MNemo clipped on a piece of line and move it forward and backward so that the wheel gets cleaned everywhere as well. Also move the pressure plate lever while washing.
- If you have the feeling there still is sediment trapped in the base of the device or in the screen cover, you can unscrew both parts to clean them directly.
- Once in a while you can apply a very small amount of silicon grease on the bottom and o-ring of the USB connector plug.

# UPDATING MNEMO

- Download the latest firmware on [www.arianesline.com](http://www.arianesline.com) ( It's a file with a .HEX extension)
- Connect the device to your computer and open MNemoBridge.
- In MnemoBridge choose Update and select the file you downloaded.
- When asked, on the Mnemo, navigate towards 
- Wait until the screen turns dark then launch the update in MnemoBridge.
- It will take about 5min to complete, you can follow the progression onscreen.

# TECHNICAL DATA

- Weight: 540g
  - Buoyancy (fresh Water): -50g
  - Size : 13x10x5cm
  - Material : Acetal, PTFE, ABS, crystal clear epoxy
  - Depth rating : 130m (depth sensor limitation) (Extended model : 290m)
  - Cave line requirements :
    - Thickness : 1mm to 5mm
    - Knots : allowed if overall diameter smaller then 5mm
    - Tension : minimum 5N
    - Optimal : #21 or #24 nylon braided line without knots and 25N tension
  - Accuracy :
    - Depth : 10cm
    - Length : 0.5% of total length +/-1.8cm
    - Heading : 1.5°
    - Loop closure: expect around 1% of error
  - Sensors:
    - Depth -> Temperature compensated new generation of high resolution altimeter sensor
    - Length -> Quadrature encoder infra-red optical detector
    - Heading/Tilt -> intelligent 9-axis absolute orientation sensor, with hard and soft iron compensation plus reference headings interpolation.
  - Memory: +/- 5000 shots
  - Battery : Rechargeable+Factory Replaceable Li-ion 400mAh- 10h stand-by, 5h reading, 2 months in sleep mode
  - Software requirement (min.) : Windows 8, Mac OSX, Linux 64b
  - Firmware Update : yes, through bootloader.
  - Accessibility : Device can be operated with one hand.
  - Warranty : 1 year excluding shipping costs for repair/replacement.
  - RoHS category 9 compliant.
  - Hand assembled, adjusted and calibrated in Mexico.
- Component country of origin: Germany, Switzerland, USA, Thailand, China