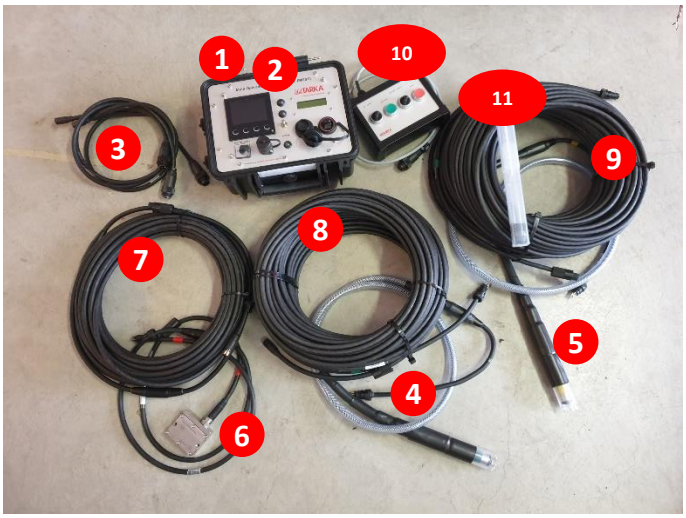
MOSS DEPTH/ANGLE

DIGITAL DEPTH/ANGLE DIVING SYSTEM

MOSS case :
Atmospheric sensor :
Submerged reference sensor :
Diver depth sensor :
Angle sensor :

Contents



1. MOSS data logger
2. Atmospheric sensor, integrated in MOSS
3. Two jumper cables
4. Sensor 3 bar [NAP] + protection (green)
5. Sensor 10 bar [diver] + protection (yellow)
6. Angle sensor + twisted-jumper-cable (red)
7. Cable 25m [male + female pigtail]
8. Cable 50m [male + female pigtail]
9. Cable 75m [male + female pigtail]
10. Button box for special application
11. Density sensor
12. Transport case
13. Splitter cable (not on picture)

All cables have male and female connectors so then can be connected to each other to extend the total length.

Transport case with all items (left), closed case (80x54x35 cm) (right)

1 INTRODUCTION

This manual belongs to the MOSS-DEPTH system and consists of two main parts:

1. Overall explanation about MOSS DEPTH/ANGLE case
2. Step by step plan how to use the MOSS DEPTH/ANGLE system

1.1 OVERALL EXPLANATION OF MOSS-DEPTH

The MOSS is a mobile data logger to display and store sensor values. With the internal battery the MOSS is ideal on remote location where no power supply is present.
The MOSS is a product of TARKA-SYSTEMS www.tarka-systems.nl

Please keep aware of the following points when using the MOSS-DEPTH system:

- It is always wise to charge the MOSS before it is used remotely
- The MOSS can also be charged during operation.
- Charger can be connected or disconnected at any moment
- The MOSS is an advisory system. Decisions based on values showed on the MOSS are always the final responsibility of the operator.

1.2 MOSS CASE

The MOSS is made in such a way that it is very easy to operate and logical in all the screens.
After start-up the operator can use the left and right button on the screen to “walk” through the different screens. All required input will be shown step by step.

The MOSS has a mini-USB stick on which all data is stored on a 1-second interval

The following text describes the screens and the steps of the MOSS-DEPTH system

Front:

- Display with 4 buttons
- On/OFF switch
- Multi connector
- Ethernet connector
- USB connector
- Battery display with two black buttons

Side:

- Three connectors (4-pins female)
    a) Submerged reference sensor
    b) Sensor at depth/diver
    c) Inclination sensor
- 4-pins male: Power charger

As the sensor inputs are based on a bus-protocol it does not matter which connector a, b or c is used.
The atmospheric pressure sensor is integrate inside the case.

1.3 SENSOR LOCATIONS

Atmospheric sensor

- Integrated inside the case

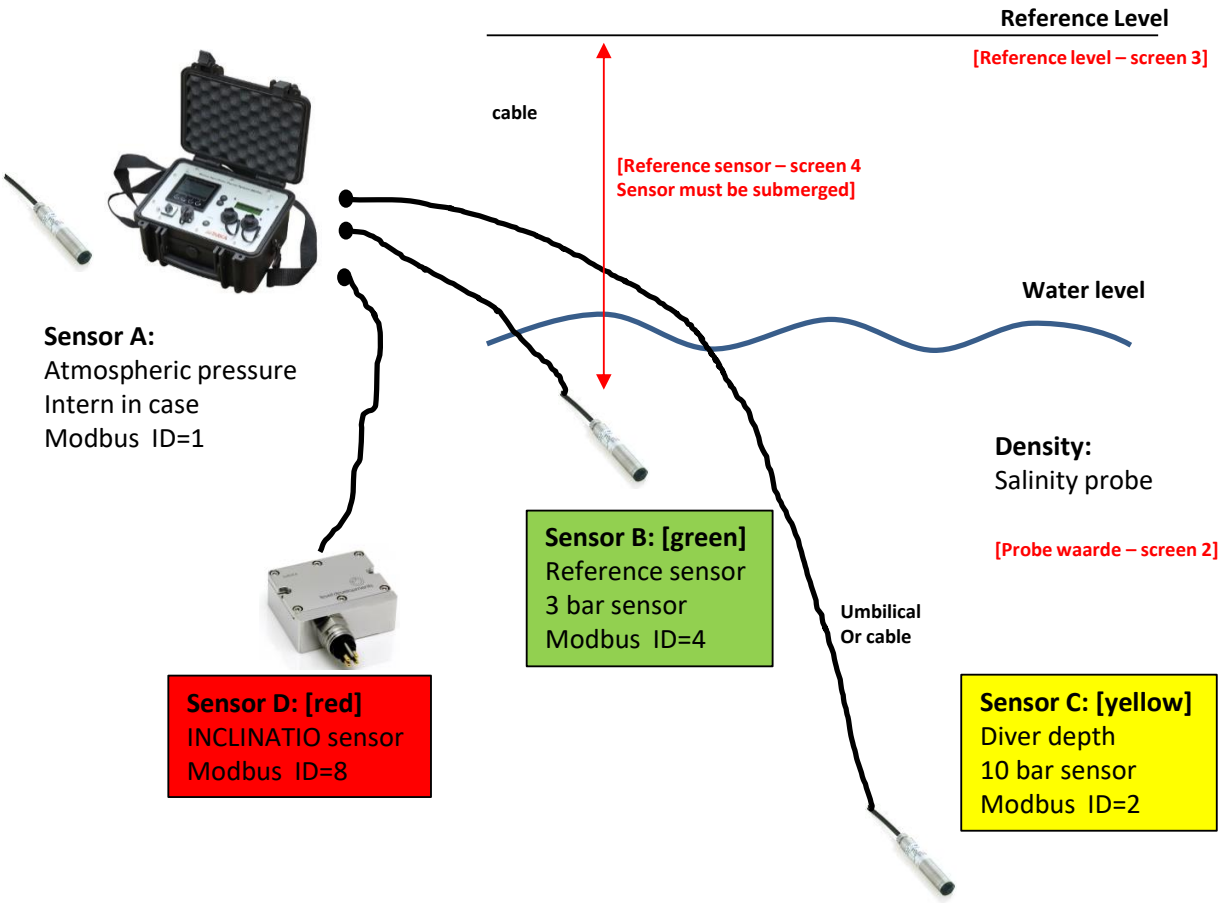
Submerged reference sensor

- Must be mounted below water level and on a fixed distance to the known reference level on the surface.

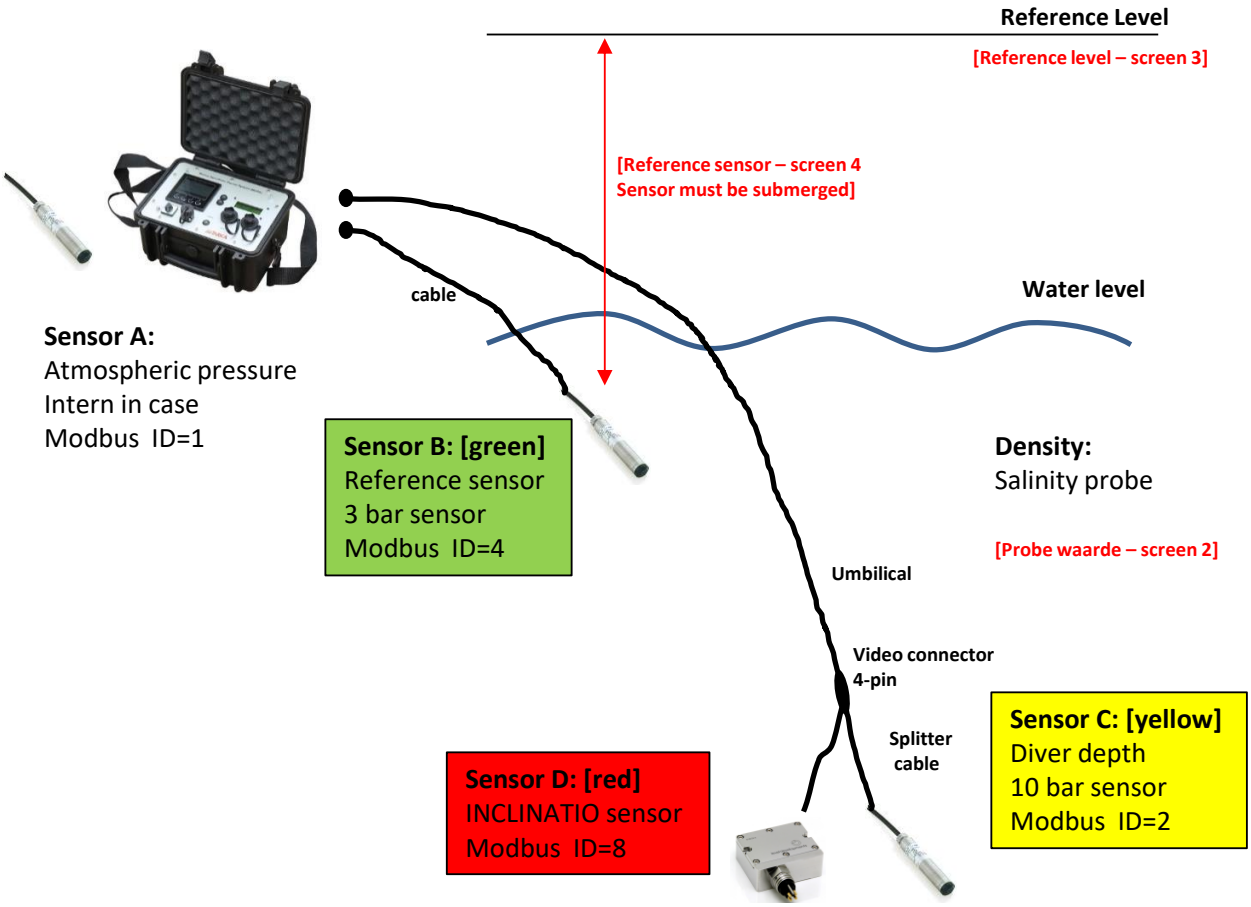
Depth/Diver sensor

- Is used by the diver on the working depth

Stand-alone setup:



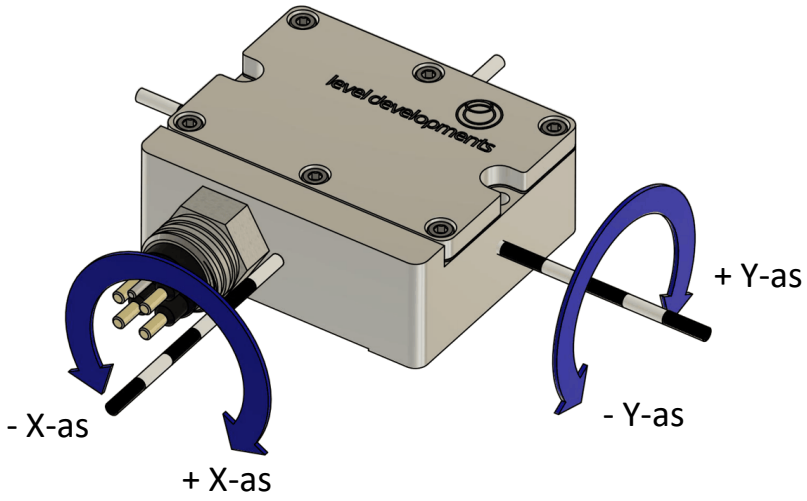
Optional setup with use of umbilical



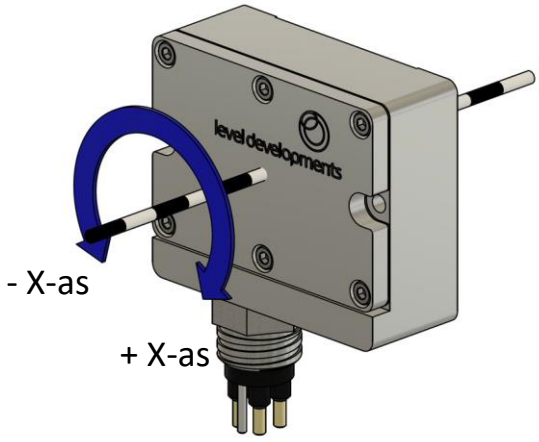
1.4 INCLINATION SENSOR

The inclination sensor has an X-axis and a Y-axis.
Sensor must be mounted on the correct way to get good readings

HORIZONTAL MOUNTING



VERTICAL MOUNTING



1.5 REFERENCE SENSOR MOUNTING

For the reference sensor a small mounting frame is present. This frame has magnets to clamp on a wall. The reference distance must be measured to the plate on which the sensor is placed, see red line.



Measure to this level

1.6 SALINITY PROBE

The salinity probe is a small floater.

Fill up the protection tube with the water in which the diving will take place. Put probe in water, read the value.

Value can be set in the software of the MOSS system.

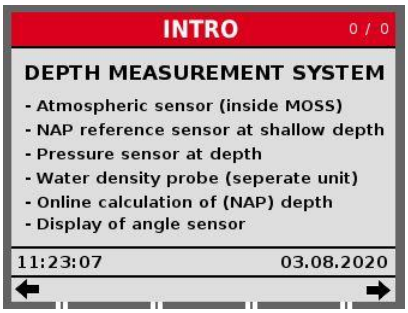
1.7 BUTTON BOX

2 SOFTWARE PROGRAM ON MOSS

The explanation below is based on the standard configuration. Due to further development or client specific solutions some points can differ.

Prior to the software steps it is assumed that the following points are already executed:

- Salinity value is measured with the floater
- Surface reference level is known
- Reference sensor is placed and distance to reference level is measured



Step 1:

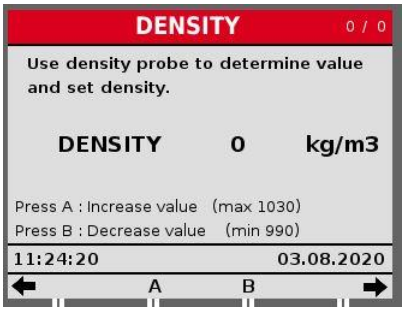
Connect sensors to the side of the MOSS
Connect power supply to the side of the MOSS
Turn on MOSS, after startup this screen with info is shown.
Left bottom: time Right bottom: date
Right top: Screen number indicator

This first screen is given for information only and gives an overview of which sensors are used:

1. Atmospheric sensor (internal in case)
2. Reference sensor (placed just below waterline)
3. Depth sensor (at diver)
4. Angle sensor

The left and right buttons on the screen can be used to walk-through the different screens

Press the right button to go to the next screen.

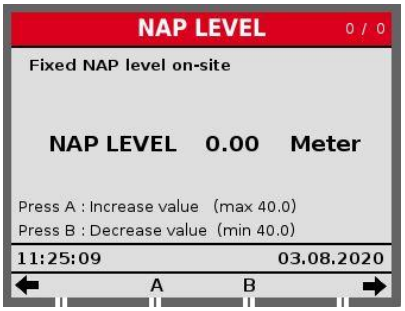


STEP 2: Setup density

The density of the water is very important and has a significant influence on the correct depth measurements.

Use the probe to measure the density and insert that number by using button A (increase) of B (decrease).
When the button is hold the counter will go faster

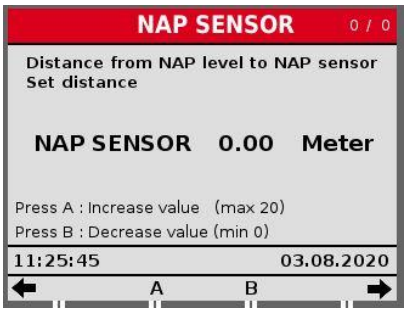
Press the right button to go the next screen



STEP 3: Setup of reference level

Enter the reference height level that is present at the excavation pit
In Dutch that is the NAP level but this is named different is other countries.

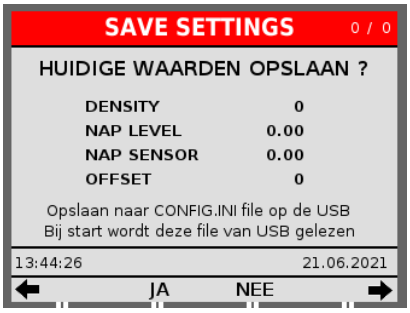
Press the right button to go the next screen



STEP 4: Setup of reference sensor (NAP sensor)

Here you enter the distance from the Reference level to the reference sensor. This is always a positive number while it is the difference between two locations.

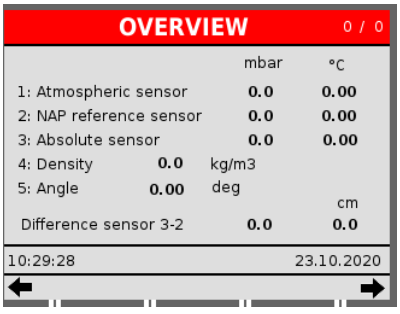
Press the right button to go the next screen



STEP 5: Save Settings

The settings of this project can be stored on the USB stick. When settings are stored on USB stick they will be read at startup. So after a power down and power up the settings of this project are loaded automatically.

Press the right button to go the next screen

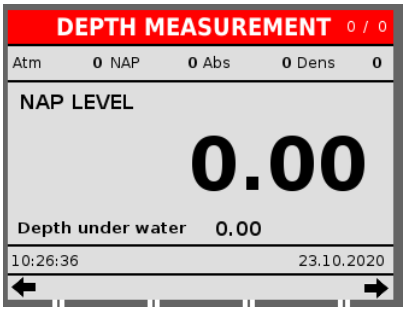


STEP 6: Overview

This screen gives an overview of the current values of the sensors.
Ideal to have a quick check if all is okay.

1. Atmospheric sensor
2. Reference sensor
3. Absolute sensor, at diver
4. Density (set manually)
5. Angle sensor

Press the right button to go the next screen

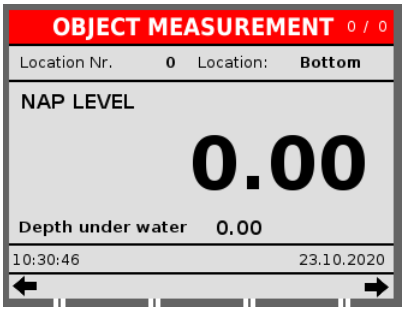


STEP 7: Depth measurement

In the upper bar the sensor values are shown.

This screen shows two values:
1. Depth related to the reference level
2. Depth under water

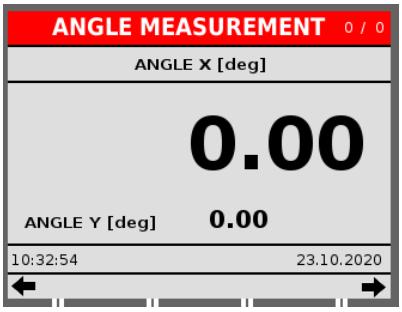
Press the right button to go the next screen



STEP 8: Object depth measurement

This screen is basically the same as the previous screen only the values in the top bar are different.
This screen is related to the use of the Manual Button Box and will show location number and if it is bottom or object.

See details Manual Button Box

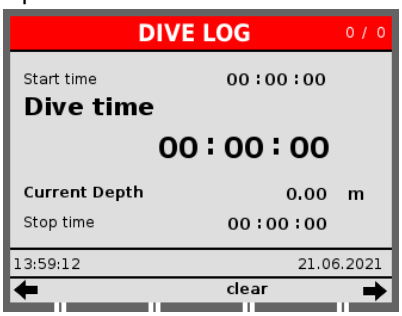


STEP 9: Angle sensor

This screen shows the values of the angle sensor.
The sensor measures X and Y angle.
The X-value is show as a large figure,
The Y-value is shown small

Press the right button to go the next screen

Optional screen A:



STEP OPTION A: Dive Log

This screen shows the dive-time of the diver
It start when diver is below 0.6m and stops when diver is within 0.4m of the surface.

Optional screen B:

STEP OPTION B: Date and time

This screen can be used to set Date and Time.

Only the right button can be used in this screen to go to next screen.

STEP 10: Overall info

Overall info on system and software.

3 DATA ON USB

USB-stick

The USB stick has multiple functions:

a) Program updates.
b) Data storage op all data based on a 1 sec interval. Data is stored when MOSS is turned on.

The following files must be present on the USB stick

a) xxxxxx.gdz (the program)
b) config.ini (setup file)

3.1 System files

Basically the MOSS system uses two files:

- MOSS_DIVE.GDZ : The program file
- Config.ini : setup file

Both file must be present on the root of the USB.
When data files or copied from the root to another device it sometimes happened that the two basic files were also deleted when USB was cleaned. Therefor a BACKUP directory is there which has a copy of both files.

The config file can be opened with any editor and looks like this:
DO NOT CHANGE ANYTHING
Only the green lines may be changed from OFF to ON , this will add extra screen to the software after restart.

```
//System
AUTOSAVE=ON
SENSORSAMPLERATE=1
SYNCCLOCK=NONE
ADDTIMESTAMP=ON
USBNEWFILEINTERVAL=3600
//Screens
SHOWDATETIMESCREEN=OFF
SHOWDIVELOGSCREEN=OFF
SHOWSETOFFSETSCREEN=OFF
//Network
TCPSERVERHOST=192.168.178.30
TCPSERVERPORT=711
LOGSERVERHOST=192.168.178.30
LOGSERVERPORT=712
[Dive]
Density=1000
NAPLevel=0.00
NAPSensor=0.00
Offset=0
```

3.2 Data storage

The following data is stored:

Date	: Date
Time	: Time
Location	: When using digital inputs the location number is stored
Bottom-Object	: When using digital inputs the Bottom-Object (0,1) is stored
Salinity	: Density (salt factor)
Reference level	: Reference level (NAP)
Reference sensor distance	: Distance from sensor to Reference level
Sensor depth offset	: offset value
ATM sensor mbar	: mbar of the atmospheric sensor
Temp ATM sensor	: temperature ATM sensor
Reference sensor mbar	: mbar of NAP sensor
Temp Reference sensor	: temperature NAP sensor
ABS Depth sensor mbar	: mbar of the Depth sensor
Temp ABS sensor	: temperature NAP sensor
Depth Water	: Depth from water line
Depth to NAP	: Depth from NAP line
Angle X	: Angle X of inclination sensor
Angle Y	: Angle Y of inclination sensor

$PTRKT,114549,05102020
$DVDAT,00,00,1000.00, 0.00, 0.14, 0.00,997.25,23.58, 0.00, 0.00, 0.00, 0.00,-10.18,-0.14,0.14,2.23
$PTRKT,114550,05102020
$DVDAT,00,00,1000.00, 0.00, 0.14, 0.00,997.26,23.57, 0.00, 0.00, 0.00, 0.00,-10.18,-0.14,0.14,2.23

USER logfile

This logfile is filled with one line every time the user presses the SAVE button on the manual-box

The following data is stored:

Date	: Date
Time	: Time
Location	: When using digital inputs the location number is stored
Bottom-Object	: When using digital inputs the Bottom-Object (0,1) is stored
Salinity	: Density (salt factor)
NAP level	: Nap level
NAP sensor distance	: Distance from sensor to NAP
Sensor depth offset	: offset value
ATM sensor mbar	: mbar of the atmospheric sensor
Temp ATM sensor	: temperature ATM sensor
Reference sensor mbar	: mbar of NAP sensor
Temp reference sensor	: temperature NAP sensor
ABS Depth sensor mbar	: mbar of the Depth sensor
Temp ABS sensor	: temperature NAP sensor
Depth Water	: Depth from water line
Depth to NAP	: Depth from NAP line
Angle X	: Angle X of inclination sensor
Angle Y	: Angle Y

$DVDAT, 130953, 05102020,00,00,1000.00, 0.00, 0.14, 0.00,997.43,23.80, 0.00, 0.00, 0.00, 0.00,-10.18,-0.14,0.14,2.23
$DVDAT, 131018, 05102020,06,01,1000.00, 0.00, 0.14, 0.00,997.42,23.81, 0.00, 0.00, 0.00, 0.00,-10.18,-0.14,0.14,2.23

4 SYSTEM OPTIONS

Below an overview of the basic setup for the MOSS-DEPTH system and the full setup.
All other options in between can be selected by client for specific projects.

	Item description Instruments, incl parts, spares etc.	Most basic setup	Setup 1	Setup 2	Full setup
1	MOSS data logger, charger, software	X			X
2	Atmospheric sensor, integrated in MOSS	X			X
3	Jumper cables 2x	X			X
4	Sensor 3 bar + protection (green)	X			X
5	Sensor 10 bar + protection (yellow)	X			X
6	Angle sensor + twisted jumper cable (red)				X
7	Cable 25m [male /female pigtail]	X			X
8	Cable 50m [male /female pigtail]	X			X
9	Cable 75m [male /female pigtail]				X
10	Button box for special applications				X
11	Density sensor	X			X
12	Transport case	X			X
13	Splitter cable				X

Extra cables of each length can be added. All cable can be connected to each other to extend length
Maximum tested length with standard cables is 100m for 3 bar sensor and 100m for 10 bar sensor.

5 PROJECT EXAMPLE SCREENS

Overzicht van 9 schermen tijdens een echte meting: