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Ministry of Environment, Climate Change, Water Resources, Parks and Wildlife

Consultancy Services
for the
National Water Sector Reform Studies for The Gambia

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INSTALLATION OF SURFACE WATER MONITORING EQUIPMENT ON GAMBIA RIVER AND SANDUGO BOLON

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1. BACKGROUND

The National Water Sector Reform Project (NWSRP) includes a component named *'Strengthen Water Resource Information Systems'* (the project's Component 3). The first part of this component deals with the actual (physical) rehabilitation and improvement of the various elements of Gambia's water resources monitoring networks in the field, which encompass four different monitoring areas, viz. hydrology (surface water), hydro-geology (groundwater) water quality, and meteorology.

With regard to the surface monitoring area the Gambia's hydrological monitoring network has been reviewed and proposals for a revised network design and required equipment have been worked out.

After the monitoring equipment was procured and received three hydrological monitoring stations, Banjul harbour, Pakaliba and Bansang have been rehabilitated, equipped and put into operation by the end of June 2014.

As the next step a new design was carried out for the five hydrological monitoring stations:

- Balingho
- Kaur
- Kuntaur
- Fatato
- Sami Tenda

The design was presented in a paper: "Design and costing of hydrological stations at five sites on the River Gambia and the Sami Bolon, July 2014".

After a tendering process, the construction work for the five hydrological monitoring stations was handed over to the contracting company Green Impact Company Ltd under supervision of the Hydrological Division under the Department of Water Resources.

The construction work was almost finalised by early January 2015 and this construction phase was straightaway followed by an installation and calibration phase which covered the period from the 8th of January to the 7th of March 2015.

2. INSTALLATION AND CALIBRATION OF EQUIPMENT

The installation and calibration phase included five field trips with visits to the station sites. The five field trips are reported below.

2.1 First field trip, January 10th to January 15th 2015

The purpose of this field trip was:

- To inspect and assess the new station constructions in terms of their ability to fulfil the requirements to installation and housing and long term operation of the monitoring equipment.
- To install ecoLog 800 equipment at Balingo, Kaur and Kuntaur stations.

All the station constructions were carried out as catwalks, with the double function to house and install the monitoring equipment out in the river itself and to provide access to the equipment from the river banks.

Balingho

Balingho was visited the 11th of January 2015. The station construction is shown in Fig. 1 and 2.

Fig. 1: Balingho station. Catwalk structure, entry stairs

Fig. 2: Balingo station. Walkway and catwalk structure. The instrument housing and the staff gauge can be seen at the end of the catwalk

The construction work fulfils the specifications, structure wise as well as material wise and the quality of the craftsmanship is acceptable. However the catwalk structure is to short to ensure that a minimum water level of 0.5 m above the ecoLog probe can be maintained under low tide conditions. It was observed that the near area around the station structure goes dry under low tide conditions.

The station structure has to be modified before the monitoring equipment can be installed and the station brought into operation. A proposed modification is presented in Annex I.

Fig. 3: Balingho, the "stilling well" pipe goes dry under low tide conditions.

Kaur

Kaur was visited the 11th of January 2015. the station construction is shown in Fig. 4 and 5.

Fig. 4: Kaur station, catwalk structure

Fig. 5: Kaur station, catwalk structure, entry stairs

The construction work fulfils the specifications, structure wise as well as material wise and the quality of the craftsmanship is acceptable. There is sufficient water depth at the "stilling well" pipe.

The staff gauge was connected to the national grid and the ecoLog 800 monitoring equipment was installed and the station put into operation.

Kuntaur

Kuntaur was visited the 12th of January 2015. The station construction is shown in Fig. 6 and 7.

Fig. 6: Kuntaur station, catwalk structure, entry stairs and walkway

Fig. 7: Kuntaur station, catwalk structure, walkway

The construction work fulfils the specifications, structure wise as well as material wise and the quality of the craftsmanship is acceptable. There is sufficient water depth at the "stilling well" pipe.

The staff gauge was connected to the national grid and the ecoLog 800 monitoring equipment was installed and the station put into operation.

Sami Tenda

Sami Tenda was visited the 13th of January 2015. The station construction is shown in Fig. 8, 9 and 10.

Fig. 8: Sami Tenda station, catwalk structure

Fig. 9: Sami Tenda, catwalk structure

Fig. 10: Sami Tenda, structure for installation of compact station

The construction work fulfils the specifications, structure wise as well as material wise and the quality of the craftsmanship is acceptable. However the catwalk structure is to short to ensure that a minimum water level of 0.5 m above the SLD probe is maintained under low tide conditions. It was observed that the near area around the station structure goes nearly dry under low tide conditions.

The station structure has to be modified before the SLD equipment can be installed and the station brought into operation. The catwalk structure has to be extended 6 - 8 m horizontally into the river. Due to the large construction height the second SLD can also be installed on the catwalk structure, provided that a second fixing plate is installed above the first fixing plate.

It was observed that the left bank (opposite the station structure) is covered with vegetation, which will influence the river flow at high water levels as well as the operation of the SLD sensors. This vegetation has to be removed.

Fatoto

Fatoto was visited the 14th of January 2015. The station construction on the south bank is shown in Fig. 11, 12 and 13 and the station construction on the north bank is shown in Fig. 14, 15 and 16.

Fatoto South Bank:

Fig. 11: Fatoto station on the south bank, catwalk structure.

Fig. 12: Fatoto station on the south bank, walkway, staff gauge and fixing plate for the SLD

Fig. 13: Fatoto station on the south bank, structure for installation of compact station

The construction work fulfils the specifications, structure wise as well as material wise and the quality of the craftsmanship is acceptable. However the catwalk structure is to short to ensure that a minimum water level of 0.5 m above the SLD probe is maintained under low tide conditions. It was observed that the near area around the station structure goes nearly dry under low tide conditions.

The station structure has to be modified before the SLD equipment can be installed and the station brought into operation. The catwalk structure has to be extended 2 m horizontally into the river. Due to the large construction height the second SLD can also be installed on the catwalk structure provided that a second fixing plate is installed above the first fixing plate.

The staff gauge was connected to the national grid.

Fatoto north bank:

Fig. 14: Fatoto station on the north bank, catwalk structure, walkway, staff gauge and fixing plates for the SLD's

Fig. 15: Fatoto station on the north bank, entry to catwalk structure, fixing plates for the SLD's

Fig. 16: Fatoto station on the north bank, structure for installation of compact station under construction.

The construction work fulfils the specifications, structure wise as well as material wise and the quality of the craftsmanship is acceptable. There is sufficient water depth to install the lowest SLD 0.5 m below the water surface under low tide conditions.

The structures will be ready for installation of the monitoring equipment, the SLD's and the compact station.

The staff gauge was connected to the national grid.

2.2 Second field trip, January 21st to January 28th 2015

The purpose of this field trip was:

- To establish and measure the river cross-sections at Fatoto and Sami Tenda
- To install the SLD equipment and the compact stations at Fatoto

Fatoto, January 22nd to January 25th 2015

The catwalk structure on the southern bank had been extended 2 m horizontally into the river by the contractor and was ready for installation of equipment.

The river cross section at the Fatoto station site was established (the "in river" part from boat as shown in Fig. 17). The measurements and the resulting cross-section can be seen in Annex II.

Fig. 17: Establishment of the river cross-section

The SLD equipment and the compact stations were installed on both the southern and northern banks (Fig. 18, 19 and 20).

Fig. 18: Assembling the solar panels for the compact station

Fig. 19: Installation of the SLD equipment (southern bank)

Fig. 20: Establishment of cable connection between the SLD's and the compact station

Sami Tenda, January 26th and January 27th

The catwalk structure had been extended 8 m horizontally into the river by the contractor and was ready for installation of equipment.

The river cross section at the Sami Tenda station site was established (the "in river" part from boat as shown in Fig. 21). The measurements and the resulting cross-section can be seen in Annex III.

Fig. 21: Establishment of the river cross-section

Balingo, January 27th

At a site meeting a modification of the station structure was agreed with the contractor. The modification is shown in Annex I.

2.3 Third field trip, January 31st to February 3rd 2015

The purpose of this field trip was:

- To install the SLD equipment and the compact station at Sami Tenda
- To calibrate the SLD equipment and the compact stations at Fatoto and Sami Tenda and to put the stations into operation

- To install ecoLog 800 equipment at the Balingo station

Balingo, January 31st

Inspection of the modified station structure. It was concluded that the modification was not carried out as specified and agreed. The contractor agreed to make the necessary corrections.

Fatoto, February 1st to February 2nd

The SLD sensors were connected to the compact stations and data logger configurations based on the cross section measurements were received from OTT Germany.

Uploading of data logger configurations. The stations were put into operation, however it was not possible to download data.

Fig. 22: Compact station at Fatoto south (left) bank

Fig. 23: Compact station at Fatoto north (right) bank

Sami Tenda, February 2nd

The SLD equipment and the compact station were installed.

The SLD sensor was connected to the compact station and data logger configurations based on the cross section measurements received from OTT Germany was uploaded. The stations were put into operation, however it was not possible to download data.

Fig. 23: Installation of SLD equipment

Balingo, February 3rd

The station structure had been modified and ecoLog 800 monitoring equipment was installed and the station put into operation.

Fig. 24: Calibration of ecoLog 800 equipment

2.4 Fourth field trip, February 18th to February 22nd 2015

The purpose of this field trip was:

- To down load generated data from the compact stations at Fatoto and Sami Tenda
- To upload updated data logger calibration files to the compact stations at Fatoto and Sami Tenda

The downloaded data showed, that the data loggers had to be re-calibrated, however the uploading of the updated data logger calibration files failed.

2.5 Fifth field trip, March 5th to March 7th 2015

The purpose of this field trip was:

- To upload new data logger firmware to the compact stations at Fatoto and Sami Tenda
- To upload updated and revised data logger calibration files to the compact stations at Fatoto and Sami Tenda
- To check instantaneous data values from the SLD sensors

The above listed goals was achieved successfully and by the end of the field trip all the SLD monitoring stations at Fatoto and Sami Tenda were finally put into operation, and they are now generating and storing data ready for downloading as required.

3. SUBSEQUENT ACTIONS AND MODIFICATIONS

In order to ensure a sustainable and correct operation of the monitoring stations a few modifications of the station structures are proposed below.

3.1 Locking devices

The locking devices provided to the protection houses for the monitoring equipment (ecoLog 800) and for the fencing of the compact stations have to be stronger and more resistant to vandalism (Fig. 25 and 26).

Fig. 25: Protection house for monitoring equipment (ecoLog 800)

Fig. 26: Compact station

3.2 Protection of SLD cables

The surplus SLD cables at the compact stations (Fig. 26) have to be protected from the effect of sunshine but also from the risk of theft. The problem can be solved by installing metal boxes inside the fencings., which can contain the surplus cables.

3.3 Chancing the position of the upper SLD's

As only the lower SLD's are used for water level measurements, it is necessary to prevent the upper SLD's from being an obstacle for these measurements. It is therefore necessary to move the upper SLD fixing plate/profile horizontally approx. 0.3 -0.5 m as shown in Fig 27.

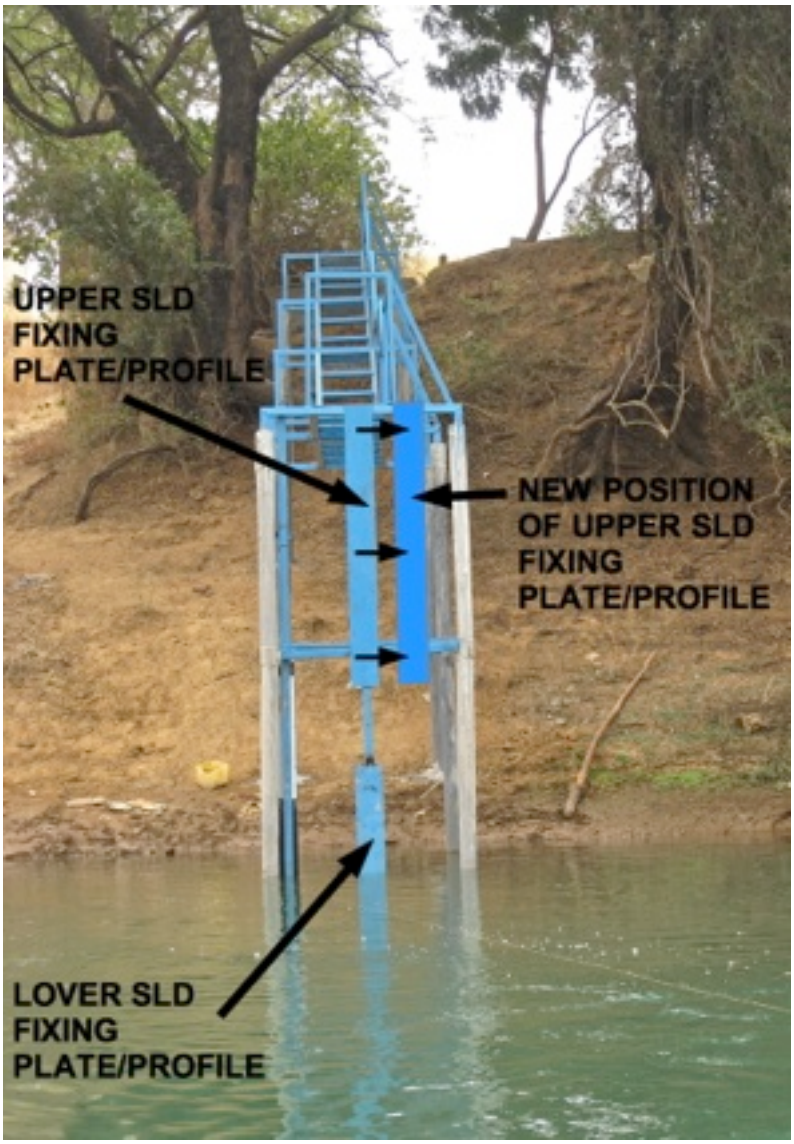


Fig. 27: Changing position of the upper SLD's

3.4 Installation of the upper SLD's

The installation of the upper SLD's has to be carried out in due time before the start of the rainy season to be ready to operate at high flow water levels.

3.5 Callibration of the upper SLD's

The upper SLD's have to be calibrated and connected to the compact station data loggers (netDL 500) as soon as the water level has raised to a position where the sensor heads of the SLD probes are covered with minimum 0.3 m water. Before this calibration is made at the Sami Tenda station a new data logger calibration file has to be supplied from OTT and uploaded to the netDL 500 data logger.

4. OPERATION AND MAINTENANCE OF THE MONITORING STATIONS

4.1 The stations equipped with ecoLog 800 data loggers

The installation and operation procedures for the ecoLog 800 data loggers are now well established routines for the staff of the Department of Water Resources.

After the stations have been put into operation it is recommended to adopt the following maintenance routines:

- Cleaning the pressure probe
  The pressure probe should be checked, cleaned and re-calibrated every 12 months or when the measurements shows doubtful values.
- Replacing the desiccant capsules
  The desiccant capsules should be replaced every 12 or 24 months or when the indicators on the capsules change color from blue to pink (each data logger contains 2 capsules)
- Checking the batteries
  The data loggers are equipped with a 26 Ah lithium battery pack, which has an expected lifetime of at least 10 years. The battery pack should be replaced when more than 20 Ah has been drawn (The drawn energy can be seen when a PC - OTT ecoLog 800 communication link has been established and the OTT Water Logger Operation Programme is running). The drawn energy should be checked every 12 month or when data is downloaded.
- Calibrating the conductivity sensor
  The conductivity sensor should be cleaned and re-calibrated every 12 month or when the measurements shows doubtful values.

The detailed maintenance procedures can be found in: "Operation instructions. Groundwater Datalogger OTT ecoLog 800" supplied by OTT.

4.2 The stations equipped with OTT SLD's (side looking dopplers)

After the stations have been put into operation it is recommended to adopt the following maintenance routines:

- Cleaning of the SLD sensor head
  The SLD sensor head should be checked and cleaned every 12 month and preferably immediately after the high flow period.
- Calibrating the SLD's
  A calibration including pressure sensor calibration and water level check, sensor alignment (tilt, pitch and roll) and a range check should be carried out every 12 month.
- Checking the compact station battery and the battery fuse
  The battery and the fuse should be checked at every visit. This is also a check of the solar panels: The solar panels are working satisfactorily if the battery is recharged.

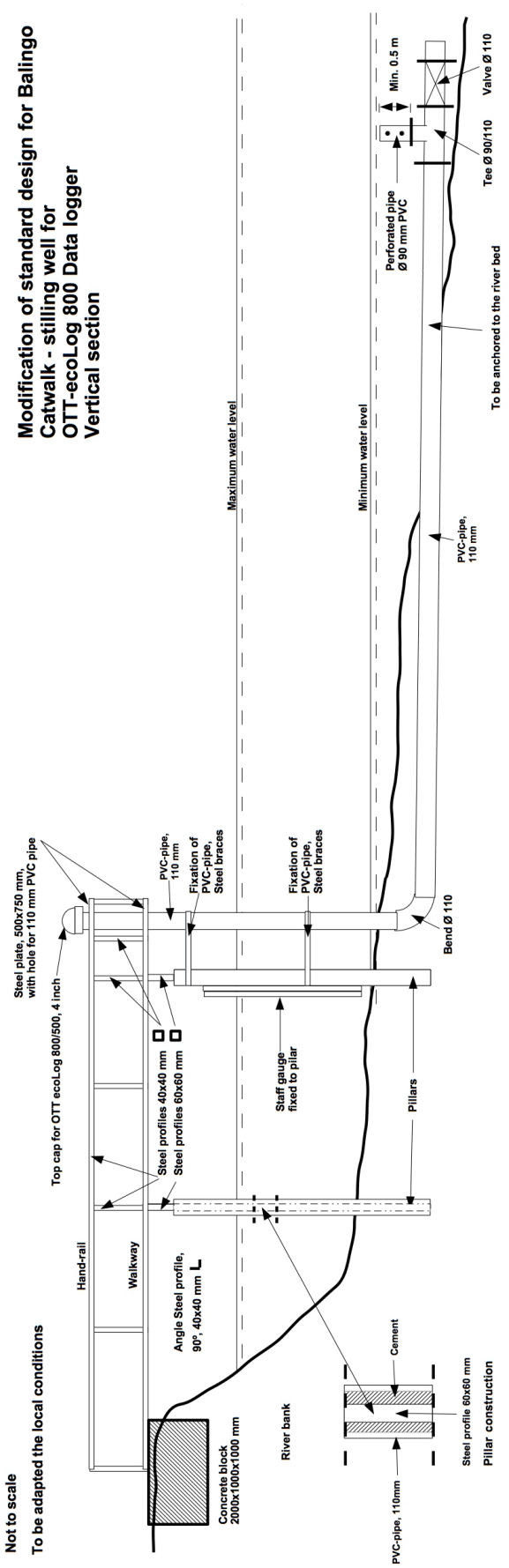
- Checking for changes in the river cross-sections
  The river cross-sections should be measured and checked once a year by the end of the high flow period. If changes are observed new calibration files have to be provided from OTT and uploaded to the data loggers.

The detailed calibration procedures including pressure sensor calibration, sensor alignment, level check and range check can be found in: "Brief instructions. Side Looking Doppler. OTT SLD" supplied by OTT.

Instructions for operating the netDL 500 data loggers, downloading of data, updating of firmware, uploading and downloading of configuration files and installation of the datalogger USB driver on PC's are given in Annex IV.

Annex I

Balingho, modification of structur


Modification of standard design for Balingo
Catwalk - stilling well for
OTT-ecoLog 800 Data logger
Vertical section
Maximum water level
Minimum water level
Min. 0.5 m
Valve Ø 110
Tee Ø 90/110
Perforated pipe
Ø 90 mm PVC
To be anchored to the river bed
PVC-pipe,
110 mm
Bend Ø 110
Steel plate, 500x750 mm,
with hole for 110 mm PVC pipe
Top cap for OTT ecoLog 800/500, 4 inch
PVC-pipe,
110 mm
Fixation of
PVC-pipe,
Steel braces
Fixation of
PVC-pipe,
Steel braces
Steel profiles 40x40 mm
Steel profiles 60x60 mm
Staff gauge
fixed to pilar
Pillars
Hand-rail
Walkway
Angle Steel profile,
90°, 40x40 mm L
Concrete block
2000x1000x1000 mm
River bank
Cement
Steel profile 60x60 mm
Pillar construction
PVC-pipe, 110mm
Not to scale
To be adapted the local conditions

Annex II
Fatoto monitoring station, river cross section and SLD calibration report

Distance from left river bank (start point of cross section) in meter	Depth in reference to Staff gauge"0" in meter	Changes in water level during measurement	Resulting depth
-1.92	6.15		6.15
0.00	5.70		5.70
1.00	5.15		5.15
2.00	4.55		4.55
3.00	3.83		3.83
4.00	2.64		2.64
5.00	2.13		2.13
6.00	0.52		0.52
8.00	0.00	0.00	0.00
9.00	-0.27		-0.27
14.00	-1.58		-1.59
19.00	-1.85	0.01	-1.86
24.00	-2.03		-2.04
29.00	-2.24		-2.25
34.00	-2.23		-2.24
39.00	-2.17	0.02	-2.19
44.00	-2.08		-2.1
49.00	-2.21		-2.23
54.00	-2.37		-2.39
59.00	-2.36	0.04	-2.40
64.00	-2.14		-2.18
69.00	-2.00		-2.04
74.00	-1.89		-1.93
79.00	-1.60		-1.65
84.00	-1.64	0.06	-1.70

89.00	-1.51		-1.57
94.00	-1.49		-1.55
99.00	-1.41		-1.47
104.00	-1.57		-1.63
109.00	-1.74	0.08	-1.82
114.00	-1.70		-1.78
119.00	0.58	0.09	0.49
120.00	1.15		1.06
121.00	2.76		2.67
122.00	3.27		3.18
123.00	4.46		4.37
124.00	5.18		5.09
125.00	5.78		5.69
126.00	6.33		6.24

Left river bank/south riverbank
Lovest SLD: X = 8.00, Y = 0.80
Upper SLD: X = 8.00, Y = 4.03
Right river bank/north riverbank
Lovest SLD: X = 119.00, Y = 1.23
Upper SLD: X = 119.00 Y = 4.08
Min water level: 1.40
Max water level: 6.00

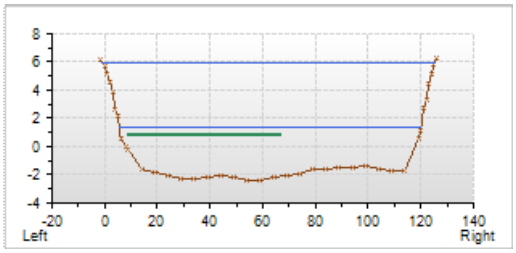
Calibration Report for OTT SLD

Measurement site

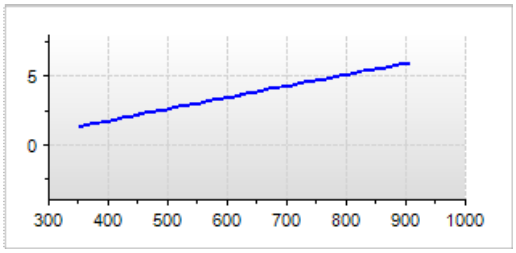
Name:	Fatato_Gambia1
Number:	
Cross-section valid from:	29.01.2015

Measurement system

Serial number:		
Height:	0,80	m
Blanking:	1,00	m
Cell width:	6,50	m



Cross-section, height in m, distance in m



Stage [m] to cross-section area [m²]

Calibration of the sensor/channel 0210

Calibration valid from:	29.01.2015 00:01
Exported to:	
Date of export:	

Stage range of the calibration

from:	1,33	m
to:	6,00	m

The calibration is based on theoretical velocity profiles according to the method of Hulsing, Smith, and Cobb:

Normalized depth h		*Normalized velocity*
from	*to*	
0,00	0,10	1,16
0,10	0,46	$1{,}20283 * (0{,}649 - h)^{0{,}0589}$
0,46	1,00	$1{,}255 * (1{,}011 - h)^{0{,}2361}$

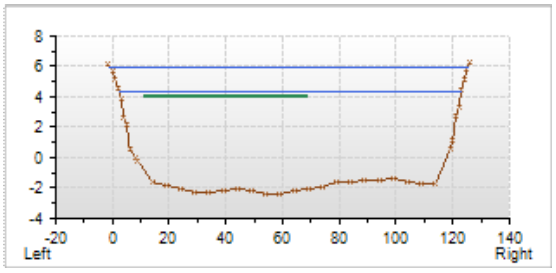
Calibration Report for OTT SLD

Measurement site

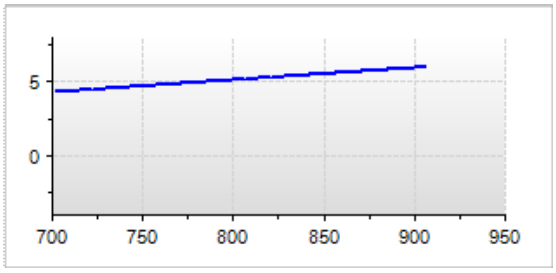
Name:	Fatato_Gambia1
Number:	
Cross-section valid from:	29.01.2015

Measurement system

Serial number:	
Height:	4,03 m
Blanking:	1,00 m
Cell width:	6,50 m



Cross-section, height in m, distance in m



Stage [m] to cross-section area [m²]

Calibration of the sensor/channel 0210

Calibration valid from:	30.01.2015 00:00
Exported to:	
Date of export:	

Stage range of the calibration

from:	4,33 m
to:	6,00 m

The calibration is based on theoretical velocity profiles according to the method of Hulsing, Smith, and Cobb:

Normalized depth h		*Normalized velocity*
from	*to*	
0,00	0,10	1,16
0,10	0,46	$1{,}20283 * (0{,}649 - h)^{0{,}0589}$
0,46	1,00	$1{,}255 * (1{,}011 - h)^{0{,}2361}$

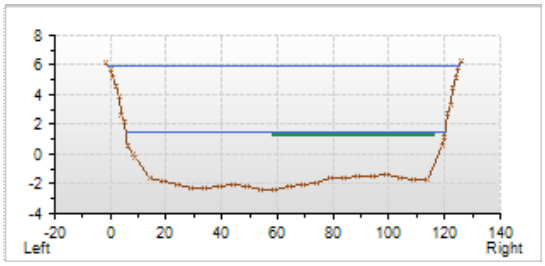
Calibration Report for OTT SLD

Measurement site

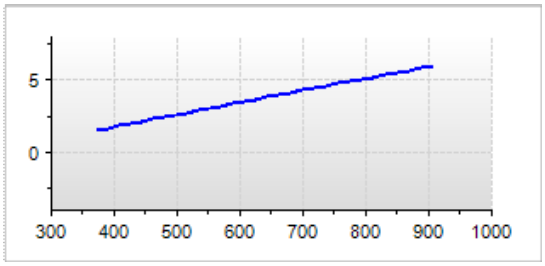
Name:	Fatato_Gambia1
Number:	
Cross-section valid from:	29.01.2015

Measurement system

Serial number:	
Height:	1,23 m
Blanking:	1,00 m
Cell width:	6,50 m



Cross-section, height in m, distance in m



Stage [m] to cross-section area [m²]

Calibration of the sensor/channel 0210

Calibration valid from:	30.01.2015 00:00
Exported to:	
Date of export:	

Stage range of the calibration

from:	1,53 m
to:	6,00 m

The calibration is based on theoretical velocity profiles according to the method of Hulsing, Smith, and Cobb:

Normalized depth h		*Normalized velocity*
from	*to*	
0,00	0,10	1,16
0,10	0,46	$1{,}20283 * (0{,}649 - h)^{0{,}0589}$
0,46	1,00	$1{,}255 * (1{,}011 - h)^{0{,}2361}$

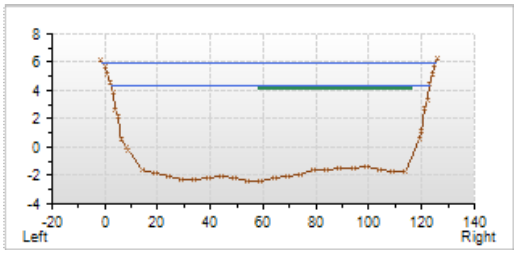
Calibration Report for OTT SLD

Measurement site

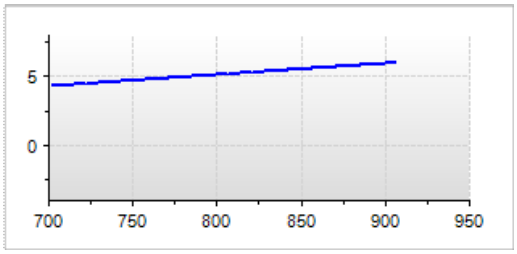
Name:	Fatato_Gambia1
Number:	
Cross-section valid from:	29.01.2015

Measurement system

Serial number:	
Height:	4,08 m
Blanking:	1,00 m
Cell width:	6,50 m



Cross-section, height in m, distance in m



Stage [m] to cross-section area [m²]

Calibration of the sensor/channel 0210

Calibration valid from:	30.01.2015 00:00
Exported to:	
Date of export:	

Stage range of the calibration

from:	4,33 m
to:	6,00 m

The calibration is based on theoretical velocity profiles according to the method of Hulsing, Smith, and Cobb:

Normalized depth h		*Normalized velocity*
from	*to*	
0,00	0,10	1,16
0,10	0,46	$1{,}20283 * (0{,}649 - h)^{0{,}0589}$
0,46	1,00	$1{,}255 * (1{,}011 - h)^{0{,}2361}$

Annex III
Sami Tenda monitoring station, river cross section and SLD calibration report

Distance from right river bank (start point of cross section) in meter	Depth in reference to Staff gauge"0" in meter, adjusted for changes in water level
-27.60	4.92
-26.00	4.85
-24.00	4.78
-22.00	4.66
-20.00	4.48
-18.00	4.31
-16.00	4.15
-14.00	3.84
-12.00	3.68
-10.00	3.18
-8.00	2.90
-6.00	2.44
-4.00	2.08
-2.00	1.77
0	1.66
2.00	1.46
4.00	1.13
6.00	0.89
8.00	0.56
10.00	0.25
12.00	0.12
13.30	0
14.00	0.03
16.00	0.12
18.00	-0.05

20.00	-0.34
22.00	-0.30
24.00	-0.23
26.00	-0.15
28.00	-0.12
30.00	0.06
32.00	0.47
34.00	0.96
36.00	1.26
38.00	1.25
40.00	1.19
42.00	1.24
44.00	1.21
46.00	1.24
48.00	1.20
50.00	1.21
52.00	1.21
54.00	1.23
56.00	1.26
58.00	1.25
60.00	1.22
62.00	1.33
64.00	1.24
66.00	1.19
68.00	1.26
70.00	1.29
72.00	1.19
74.00	1.27
76.00	1.26

78.00	1.24
80.00	1.22
82.00	1.31
84.00	1.44
89.00	1.48
91.00	1.63
93.00	1.80
95.00	1.93
97.00	2.08
99.00	2.01
101.00	2.61
103.00	2.85
105.00	3.03
107.00	3.25
112.00	4.08
117.00	4.83
122.00	5.60

Right river bank
Lovest SLD: X = 13.30, Y = 0.60
Upper SLD: X = 13.30, Y =3.00
Min water level: 0.85
Max water level: 4.90

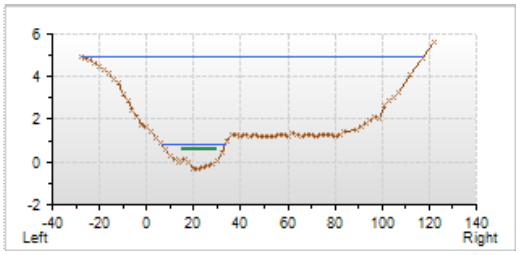
Calibration Report for OTT SLD

Measurement site

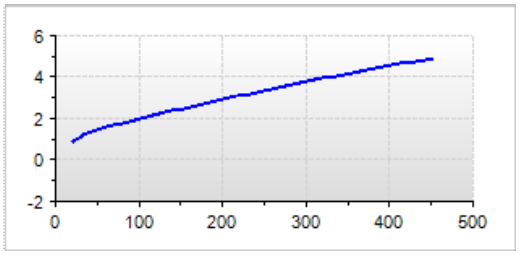
Name:	tenda
Number:	0000000002
Cross-section valid from:	02.02.2015

Measurement system

Serial number:	
Height:	0,60 m
Blanking:	1,00 m
Cell width:	1,70 m



Cross-section, height in m, distance in m



Stage [m] to cross-section area [m²]

Calibration of the sensor/channel 0210

Calibration valid from:	02.02.2015 00:01
Exported to:	
Date of export:	

Stage range of the calibration

from:	0,80 m
to:	4,92 m

The calibration is based on theoretical velocity profiles according to the method of Hulsing, Smith, and Cobb:

Normalized depth h		*Normalized velocity*
from	*to*	
0,00	0,10	1,16
0,10	0,46	$1{,}20283 * (0{,}649 - h)^{0{,}0589}$
0,46	1,00	$1{,}255 * (1{,}011 - h)^{0{,}2361}$

Annex IV
Instructions for operating the netDL data loggers

1. Downloading of the current configuration files of the data loggers

This operation is done by using the Data logger operation program

1. Connect the USB interface port of the OTT netDL data logger to the USB interface of the PC using an USB cable
2. Start the Data logger operation program
3. The configuration shows up in the main window (If not, select the "netDL 500" menu and click the “Read” option (if the "netDL 500" menu isn’t shown, then select "netDL 500" in the “Device” menu)
4. In the “File” menu select the "Export Configuration” option
5. An export window shows up. Change the file name (if necessary) and select the storage location on your computer
6. Click “Store” and the configuration is stored on your computer as a *BIN file

2. Uploading /updating firmware to the data loggers

The USB connection is established between data logger and PC.

1. Move the updated firmware *bin file to the Data logger operation program's installation directory/folder
2. In the "netDL 500” menu select the “New Program Code” option
3. In the “New Program Code” window select the updated *bin file
4. Click the open button
5. Confirm by clicking “Yes”. The data loggers LCD display shows: “ Update in progress"
6. The data logger will restart resuming its processing, measuring and data collection activities

No stored data will be lost after the update

3. Uploading of updated configuration files to the data loggers

The USB connection is established between data logger and PC.

1. Open the data logger operation program
2. In the “File" menu select “Import" (new configuration)
3. If Confirm Ignore Changes ? shows up, click “Yes"
4. In the "netDL 500 Configuration Import" window select the corresponding updated configuration file (*BIN file)
5. Click on “Open" and the operation program imports the updated configuration from your PC
6. In the “Configuration" menu select "Save"
7. A window may show up with "This configuration name already exists ! Replace?". Click "Yes"
8. In the Configuration menu select "Load"
9. A window may show up with "Confirmation. Ignore changes ? Click "Yes"
10. In the "Stored OTT netDL 500 Configurations" window select the updated configuration by double clicking
11. The operation program uploads the updated configuration to the datalogger

12. Enter the correct number and name in the main window of the operation program (Master data) and click at the “Program” button (or in the "netDL 500” menu select the “Program” option
13. In the “Warning: reset OTT netDL and delete data memory additionally” window select “Yes”
14. The data logger is now configured and starts to operate, collecting and storing data

4. Checking instantaneous values

The USB connection is established between data logger and PC.

1. In the data logger operation program select the “netDL 500” menu and click the "Instantaneous values” option. The “netDL 500 - Instantaneous values” window shows up. Take screen shots which cover all the channels and save them on the PC
2. Display the instantaneous values by using the observer function of the data loggers LCD display: Press the jog shuttle twice which activates the selection menu
3. With the jog shuttle select “Observer” and press →
4. The instantaneous value of the first channel is shown
5. With the jog shuttle press → to se the instantaneous value of the next channel and repeat to se the additional channels

5. Downloading data by using Hydras 3

For "Hydras 3" to recognize monitoring equipment, sensors like SLD's and to download and store data on the computer, it is necessary that a "Workspace" has been created.
An existing "Workspace" can be used or a new "Workspace" can be created (Open Hydras 3, select in the main window File/New workspace. In the "Create new workspace" window fill in a number between 1 - 9, there can only be nine workspaces) and a name and choose and create a subdirectory on your PC for storing the "Workspace" (enter the path). An empty workspace have been created. When connected to the data loggers, Hydras 3 automatically sets up the stations and sensors.

1. Connect the USB interface port of the OTT netDL data logger to the USB interface of the PC using an USB cable
2. Start "Hydras 3"
3. In the “three" display (left side of the main window) select the station and in the "Communication menu" select "Download data/Operate".
4. In the "communication window" select the USB Communication path.
5. Select the required sensor or all sensors
6. Select the required period or "All"
7. Press the “Start" button (the measured data is copied to the PC in raw data format)
8. Disconnect the USB cable

6. Installation of the netDL 500 USB driver on a PC

The installation can only be carried out, when the PC is connected to a data logger and the instructions below are followed:

1. Open the Device manager of your Windows operation system
2. Connect the PC to the NetDL using the USB cable
3. After connecting, the device manager will recognize the NetDL data logger
4. Right click on it and select driver update
5. Select the folder where you have saved the driver (the folder has to be unzipped).
6. Select and "check" the Box which will include the all the subfolders and then click OK.