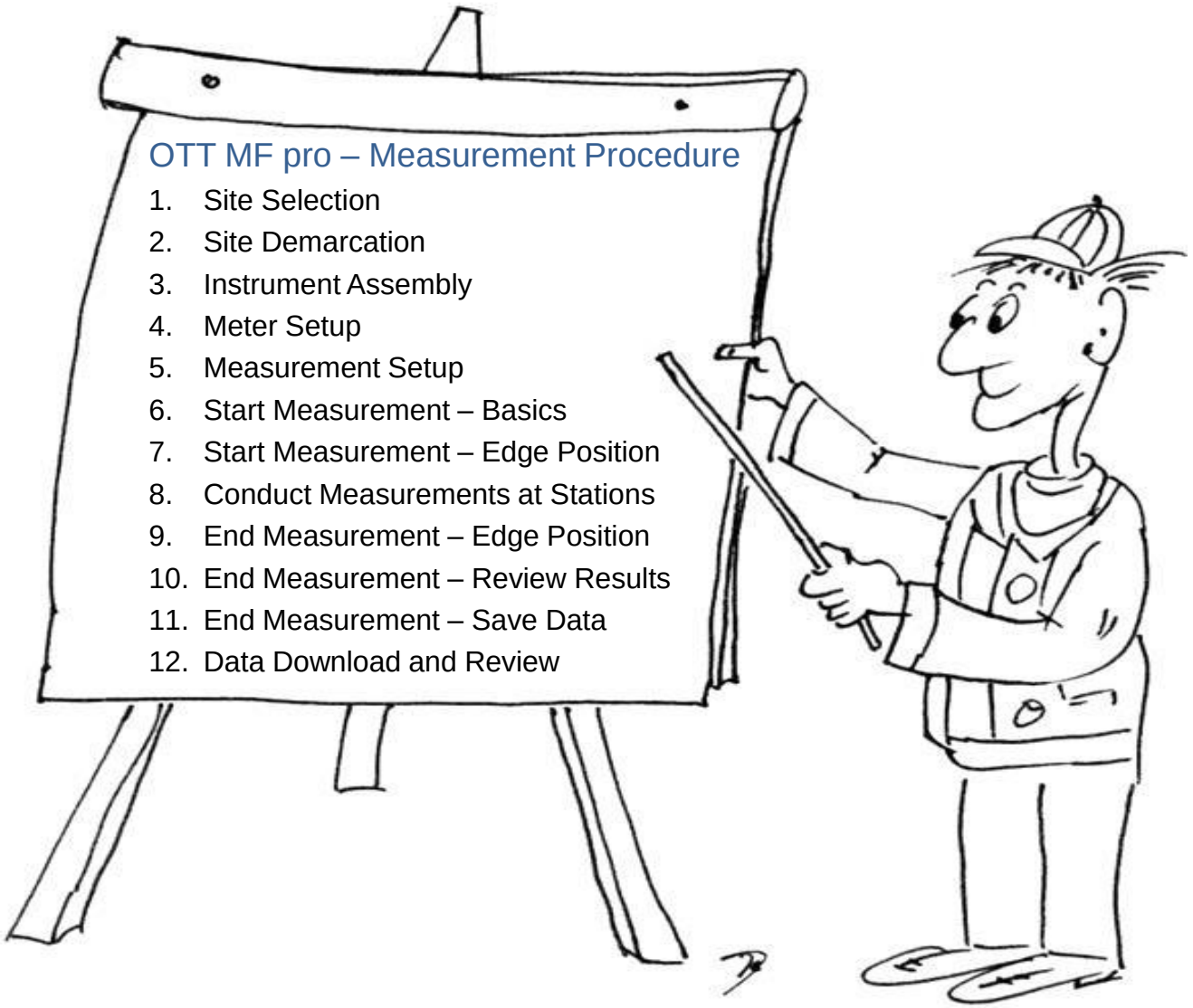
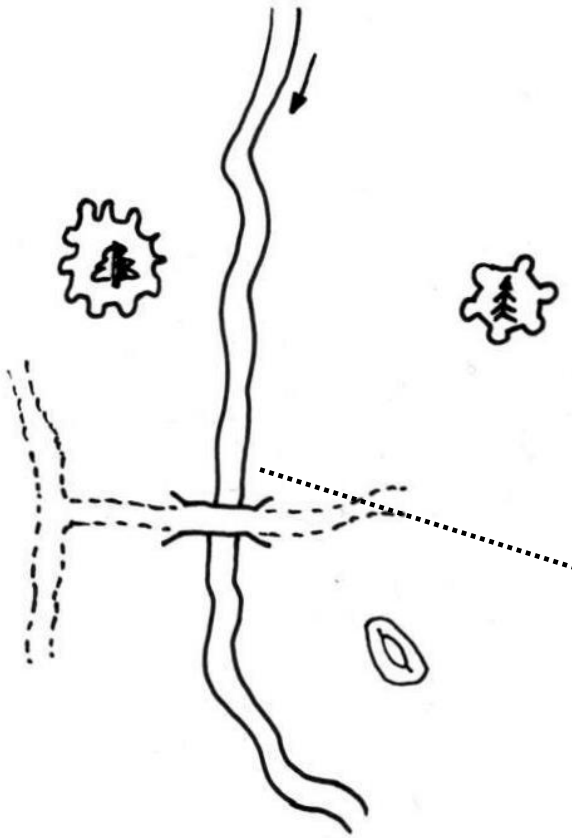
MF PRO MEASUREMENT PROCEDURE FW 2.0 STEP BY STEP

Stefan Siedschlag – Product Manager Hydrology / Discharge

AGENDA

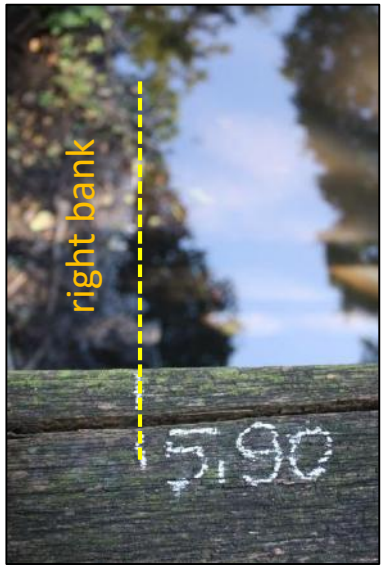


SITE SELECTION



- Select a site with straight reach and uniform cross-section.
- The flow should be parallel to the bank and at a right angle to the measurement section.
- Take care for stable river bed and banks.
- Avoid sites with reverse flow, dead water zones or swirls.
- The cross-section should be unobstructed by obstacles.

SITE DEMARCATION



- Define a reference point at the bank
- Divide the cross-section in a certain number of stations (verticals).
- Consider the number of stations according to ISO 748 *)
- A cross-section survey in advance is recommended and should be used for locating stations where the bottom elevation changes significantly.
- Use a tape for measuring the distances of bank and station positions.
- Mark left edge, station positions and right edge clearly visible.

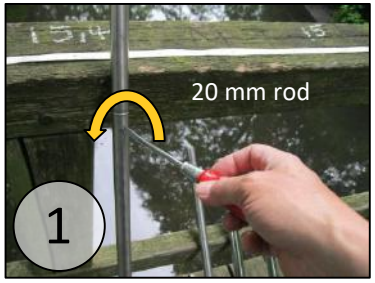
*) ISO 748:2007 Hydrometry – Measurement of liquid flow in open channels using current-meters or floats

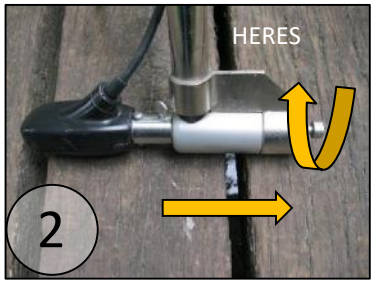
INSTRUMENT ASSEMBLY

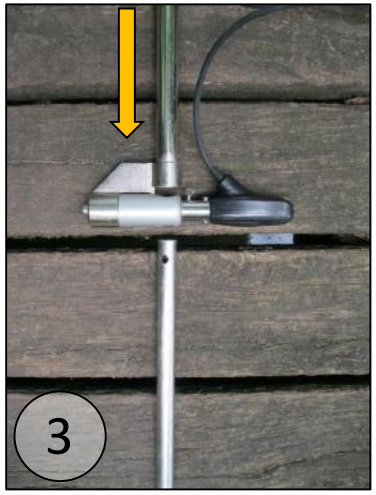
Prepare your instrument components:

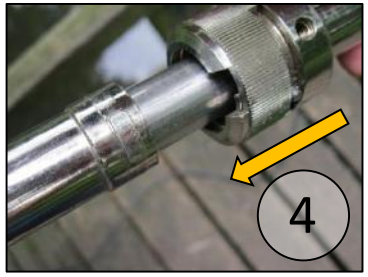
1. 20 mm universal rod
2. Relocation device HERES
3. MF pro sensor
4. MF pro adapter for use with 20 mm universal rod
5. MF pro portable meter
6. MF pro adjustable meter mount

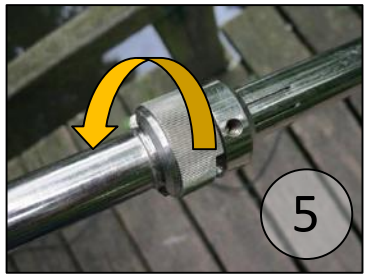
INSTRUMENT ASSEMBLY



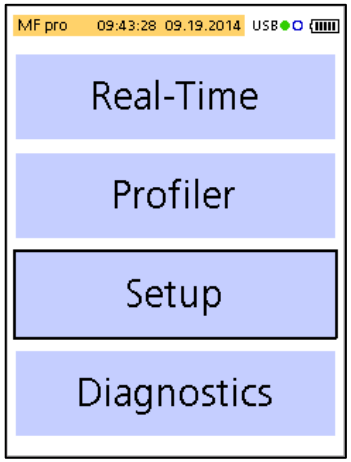


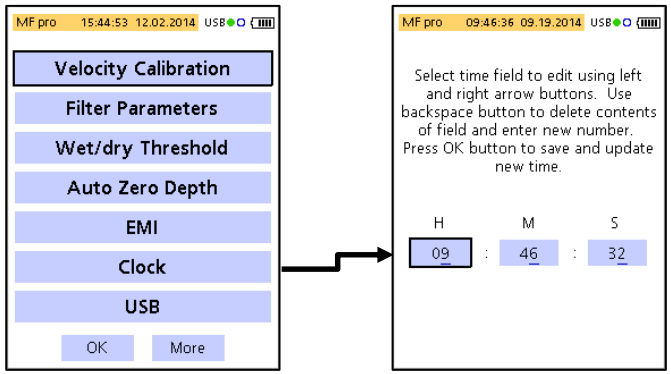




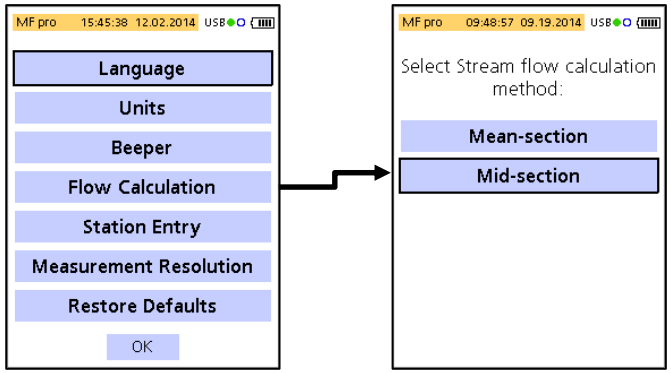


METER SETUP

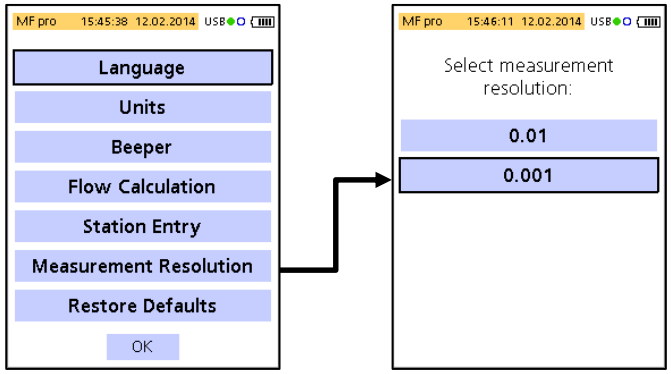




Setup time and date

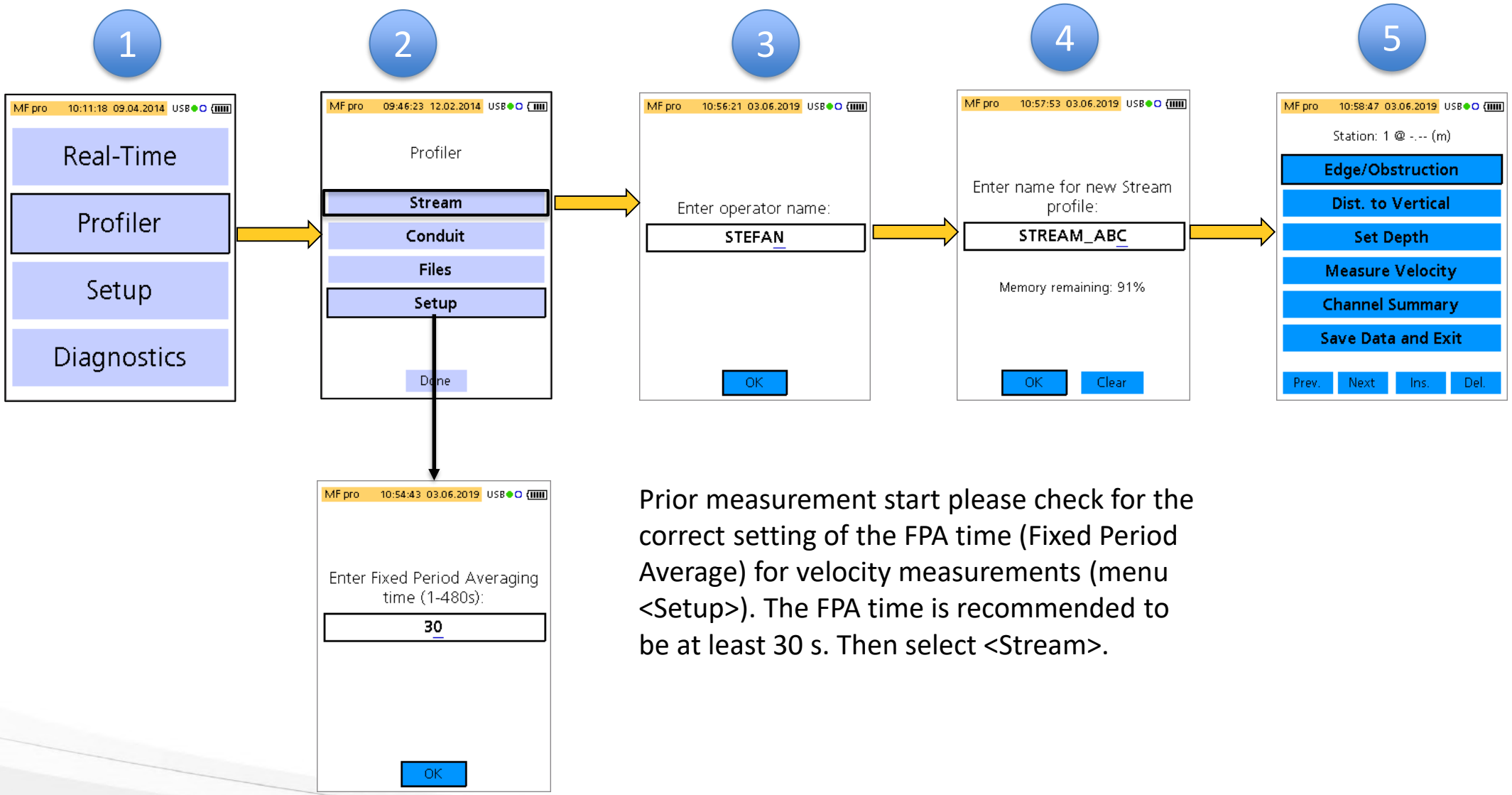


Setup discharge calculation method



Setup measurement resolution

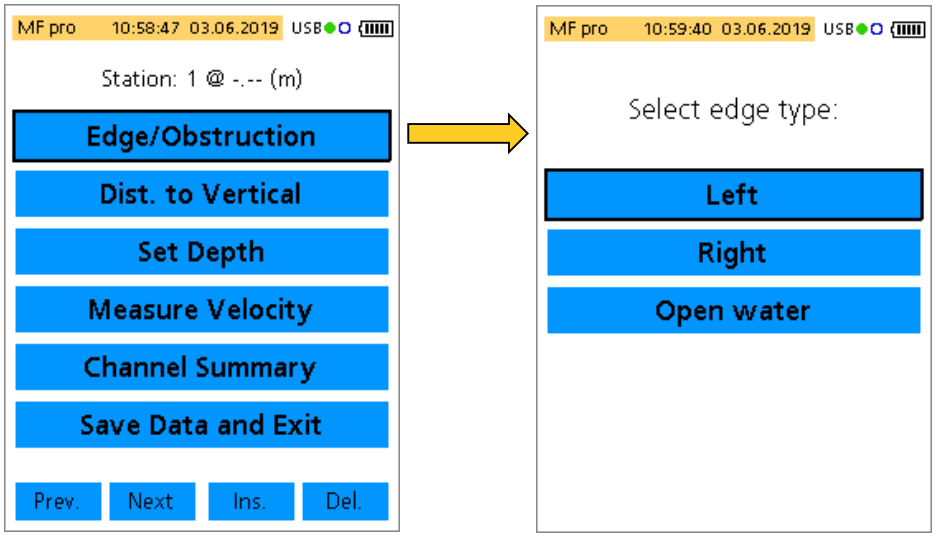
START MEASUREMENT – BASICS



Prior measurement start please check for the correct setting of the FPA time (Fixed Period Average) for velocity measurements (menu <Setup>). The FPA time is recommended to be at least 30 s. Then select <Stream>.

START MEASUREMENT – EDGE POSITION

1



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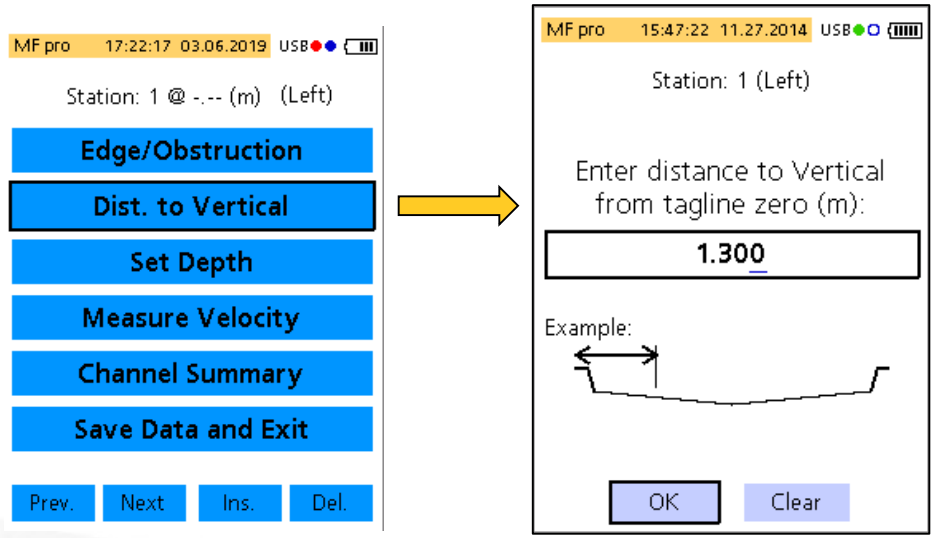
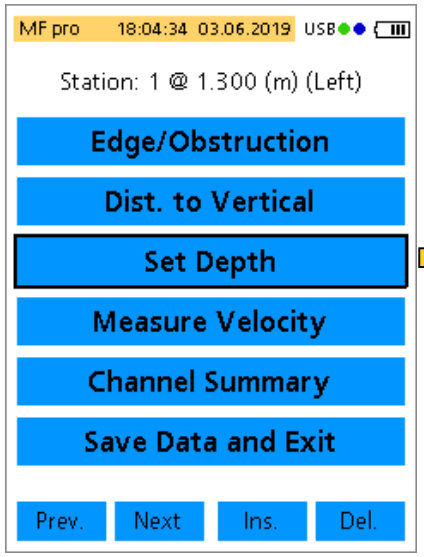
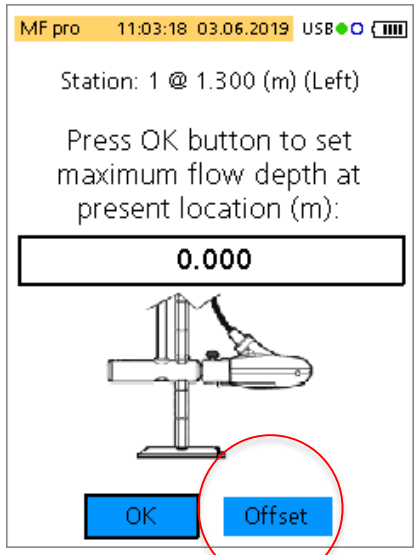
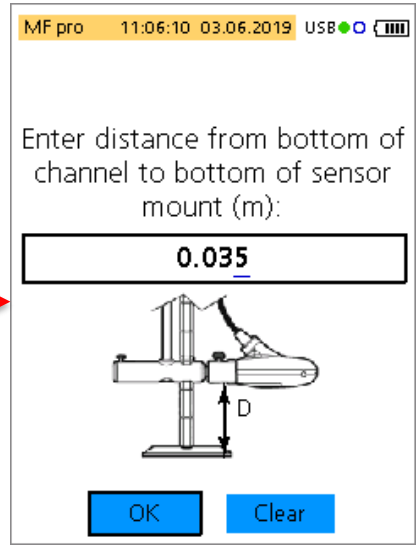


START MEASUREMENT – EDGE POSITION

3



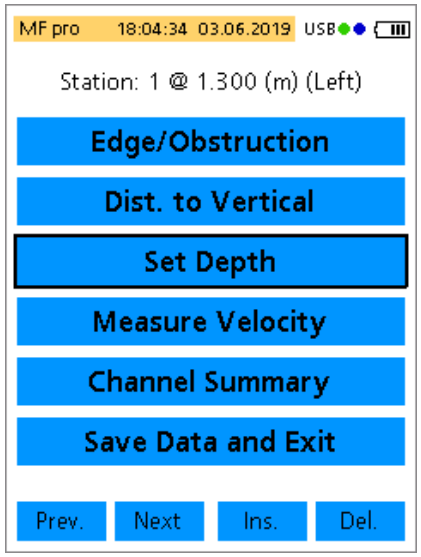


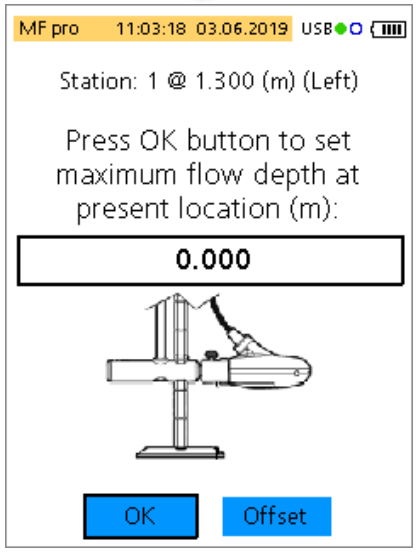


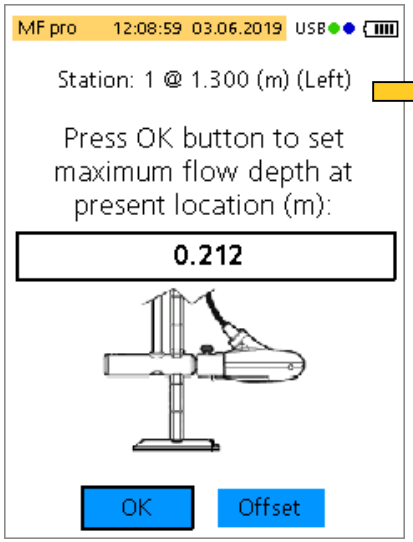
If the MF pro sensor is used with a rod which has a spike and the spike does not cave in the ground you'll need to enter the offset value. For OTT 20 mm universal rods it is 0.035 m. The offset can be changed at each station.

START MEASUREMENT – EDGE POSITION

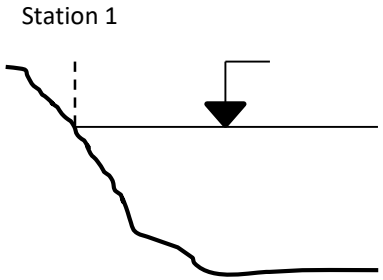
4

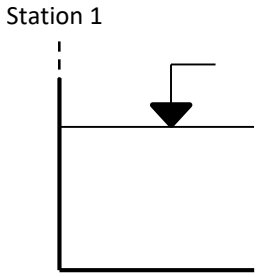






The edge factor corresponds with the roughness of the bank (see manual).

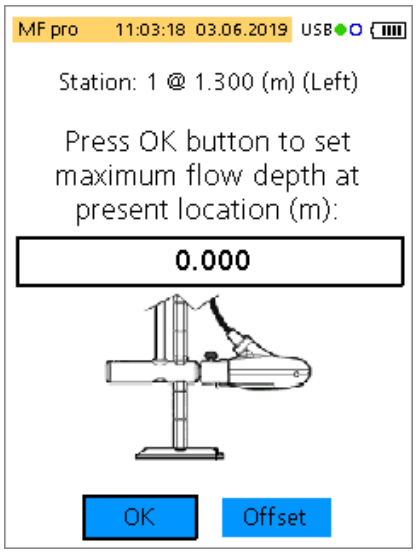




Please note:

For trapezoidal banks or natural river banks the depth at station 1 is zero. For vertical banks you'll need to measure the depth.

START MEASUREMENT – EDGE POSITION



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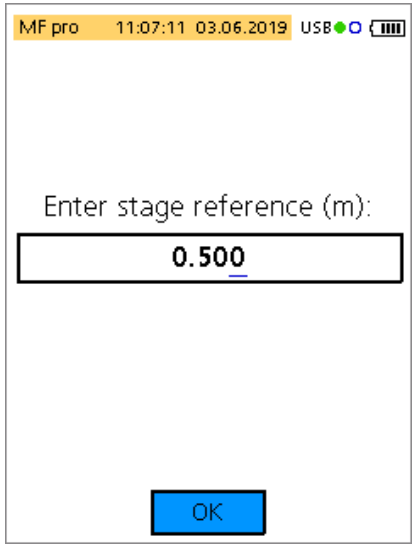

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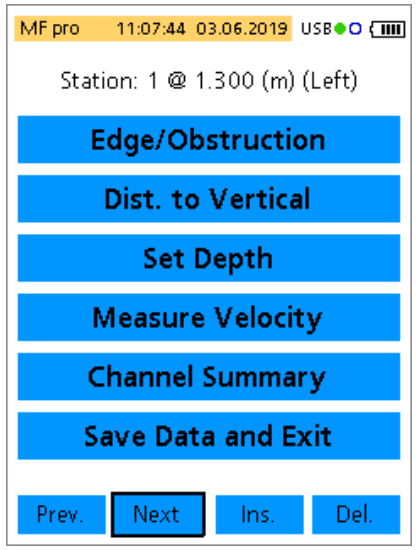
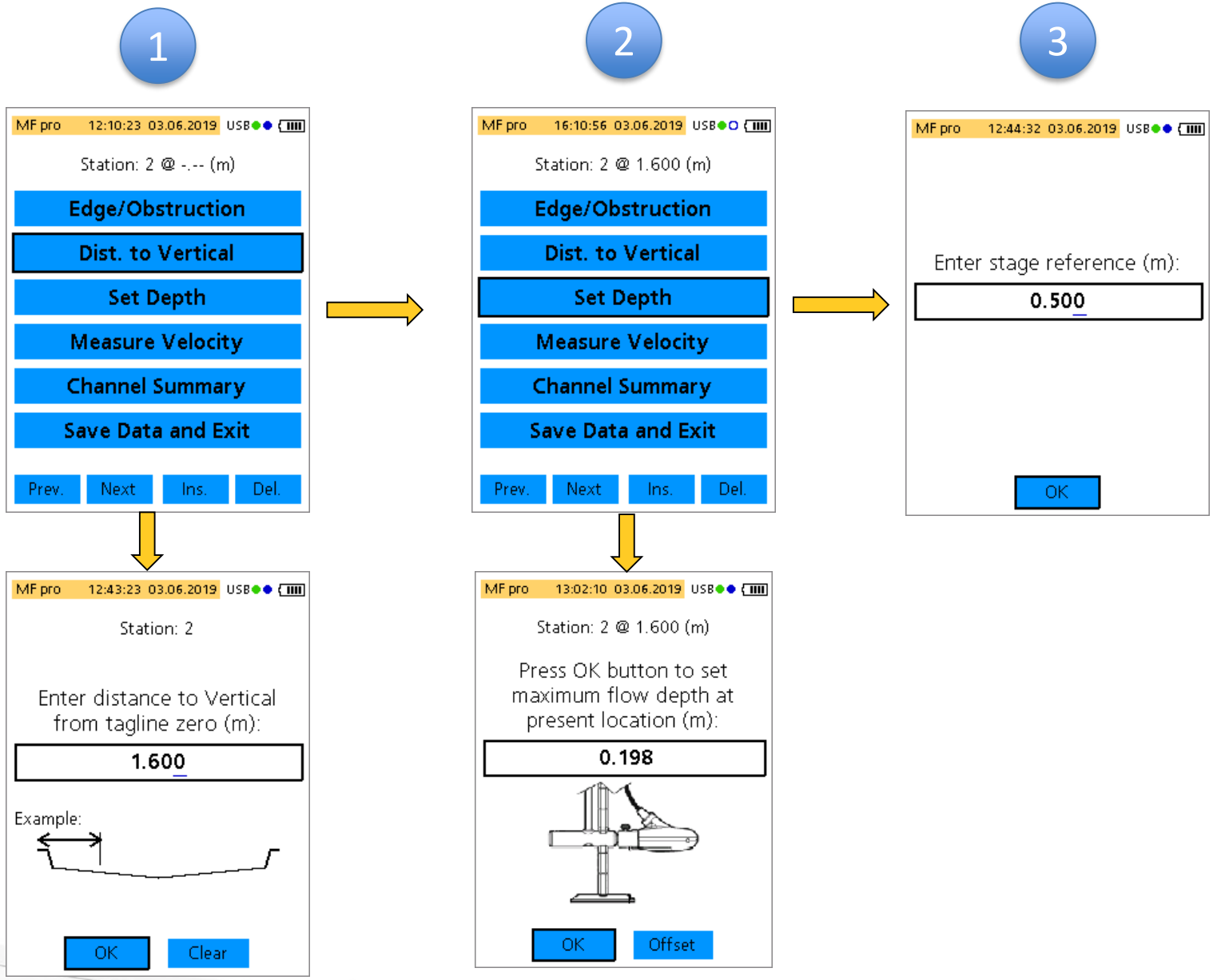


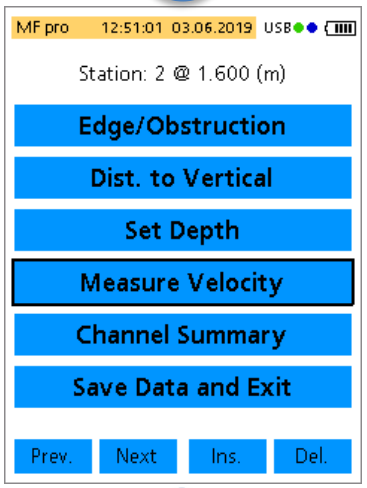
If all settings for the edge position (station 1) are done select <Next> to move forward to station 2.

CONDUCT MEASUREMENTS AT STATIONS



CONDUCT MEASUREMENTS AT STATIONS

4



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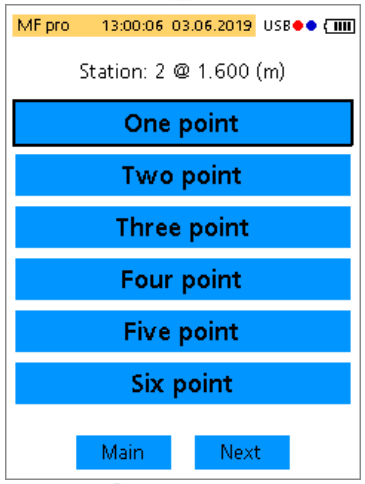

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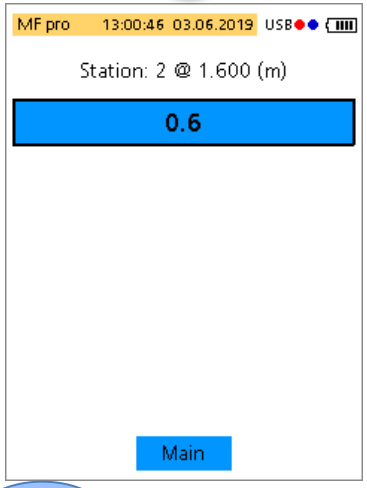

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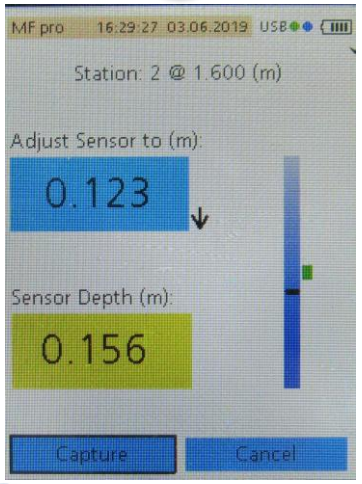
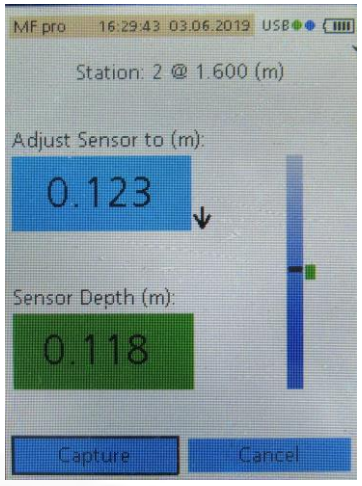
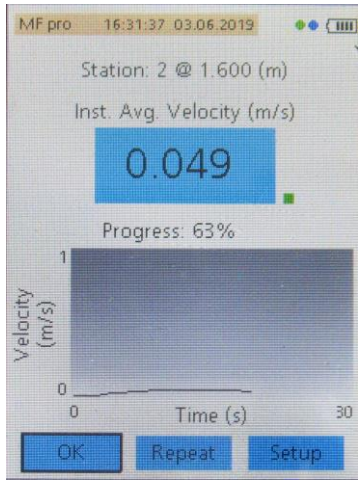


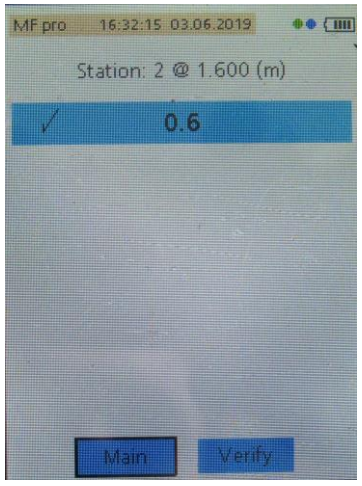
8



9



10



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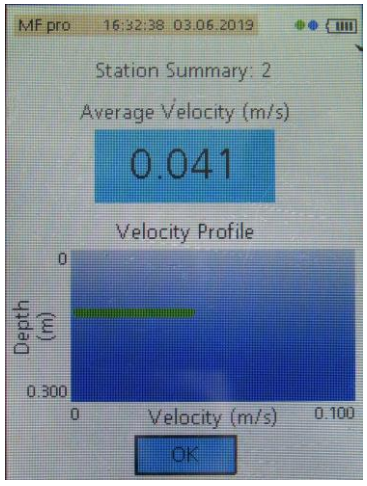
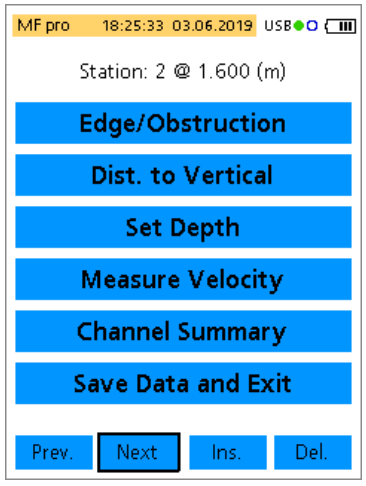
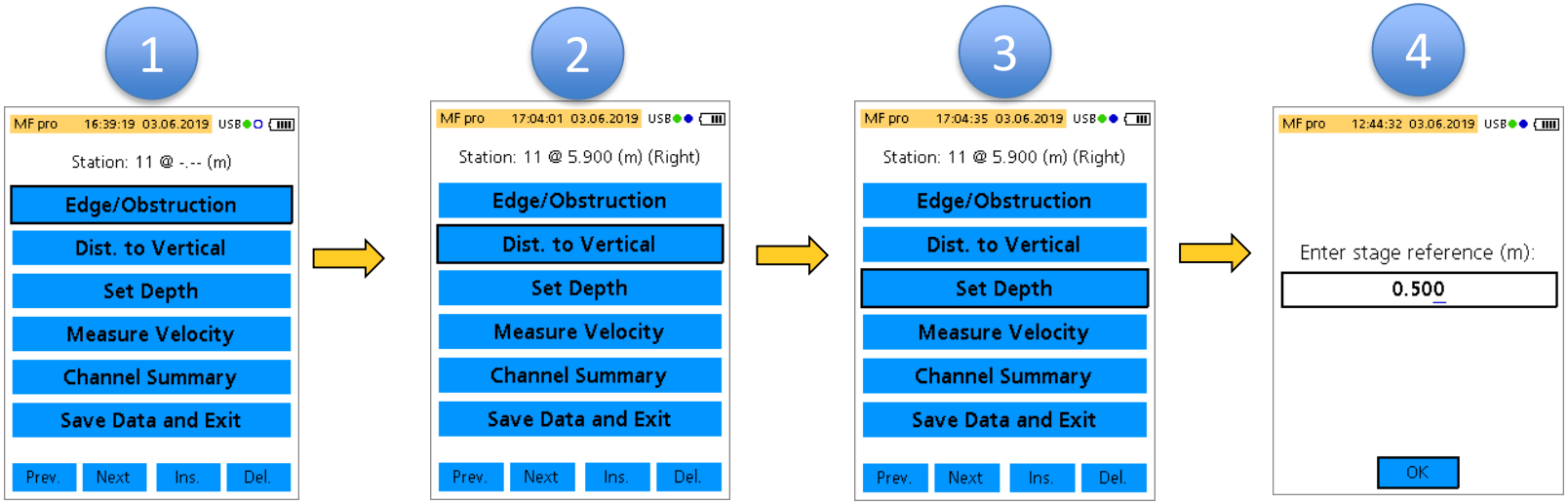


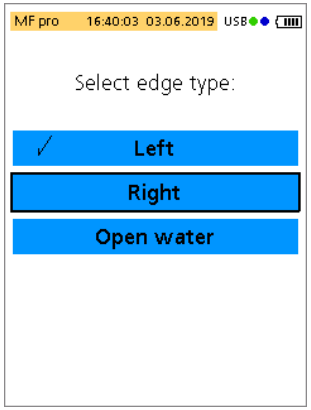
12

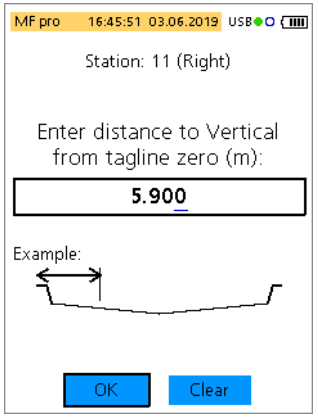


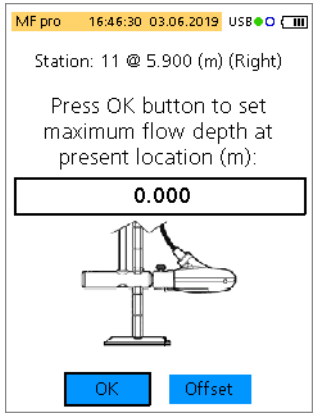
Select an appropriate velocity method. Move the probe until the sensor depth proposal is met (green background). Select <Capture>, repeat this procedure for all points where appropriate. Check the velocity distribution (<Verify>. Return to the <Main> menu and select <Next> to move forward to the next station.

END MEASUREMENT – EDGE POSITION









END MEASUREMENT – REVIEW RESULTS

Each bar represents the measured depth at the station.

Each bar represents the percentage of measured discharge q per station related to the total Q.

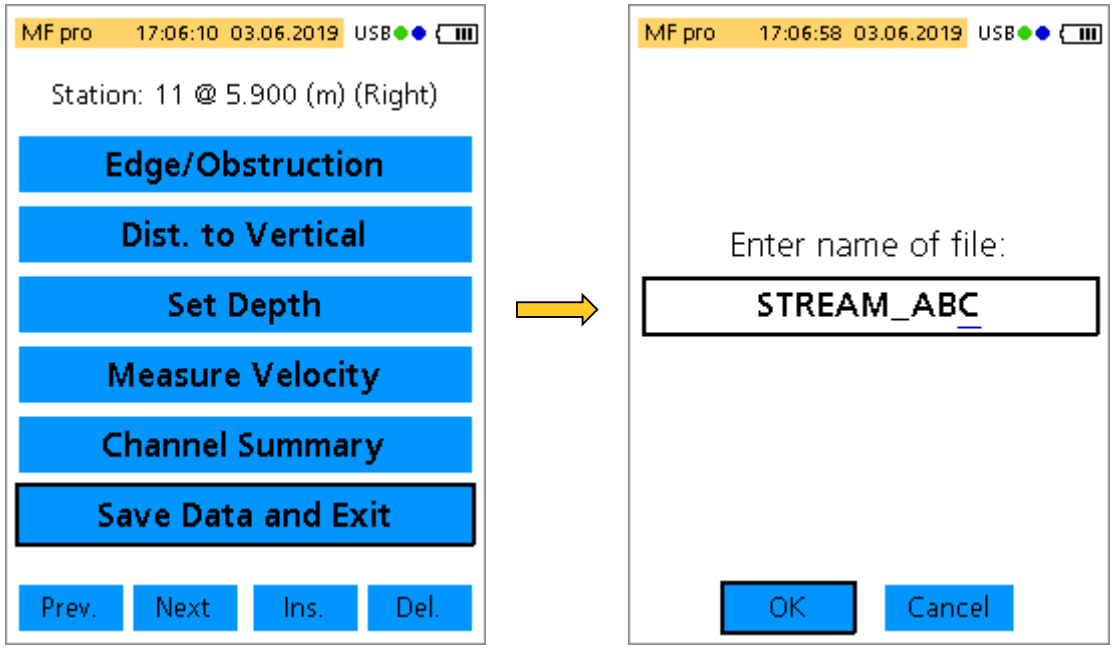
Green = q ≤ 5%

Yellow = 5% < q ≤ 10%

Red = q > 10%

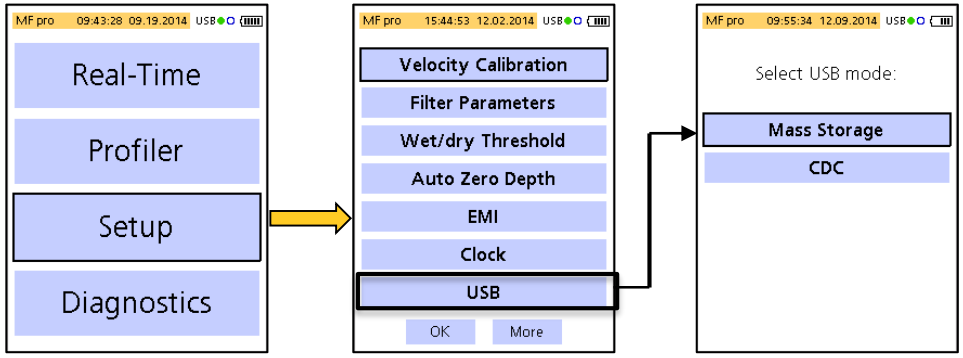
Each bar represents the mean velocity at the station.

END MEASUREMENT – SAVE DATA



Finish your measurement by selecting <Save Data and Exit>. The proposal for the file name is taken form the entered name for the stream profile.

DATA DOWNLOAD AND REVIEW



1. Set the USB port to „Mass Storage“.
2. Connect the meter with the PC via USB cable
3. Switch the meter on.
4. Download your measurement from the folder named “P”.

*.TSV output file

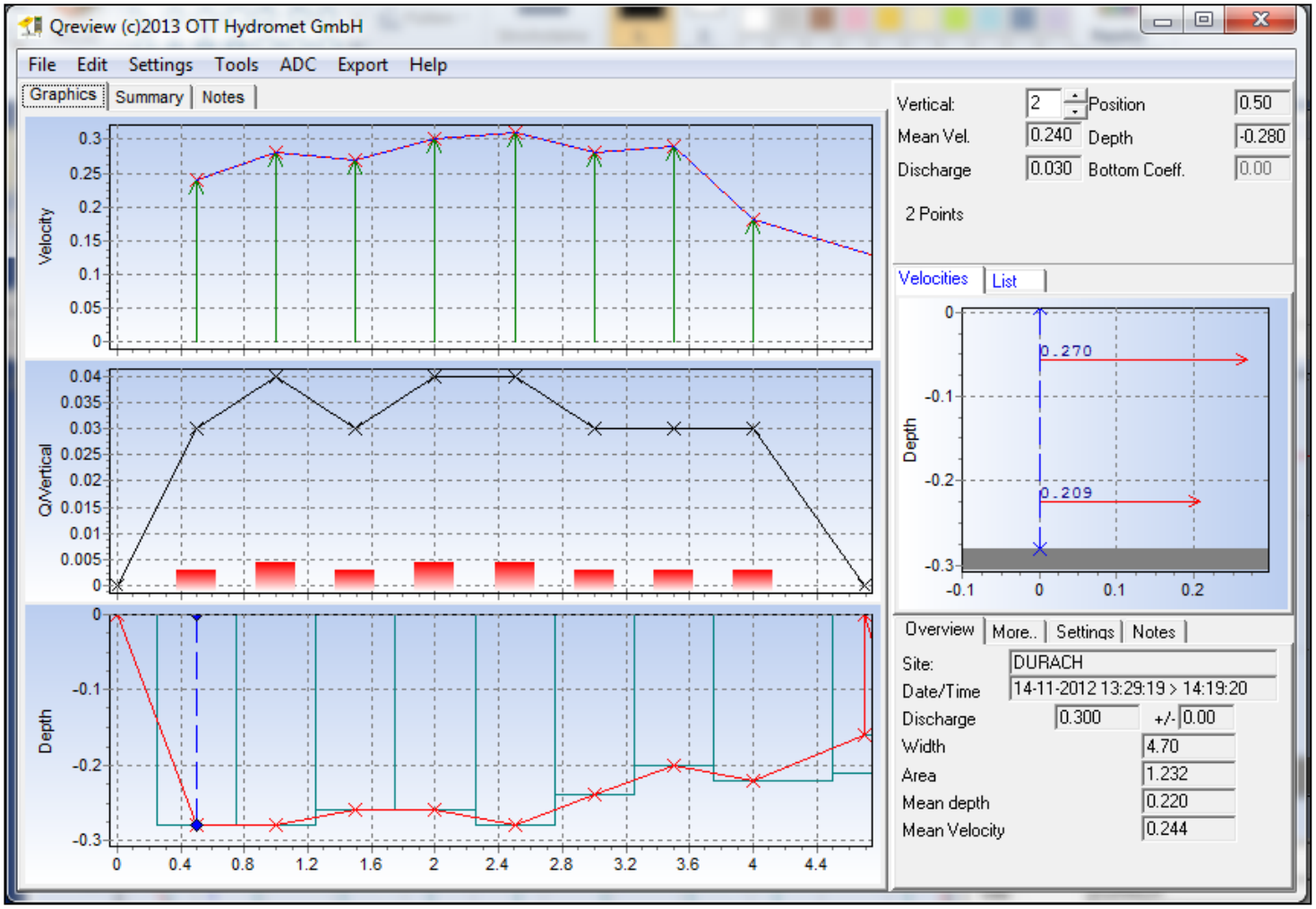
```
Filter: FPA  Parameter: 30 s
Pre-filter: On  Rank: 5
EMI: 50Hz.

Station Entry: Non-fixed
Flow Calculation: Mid-section
Start Edge: Left edge water
# of Stations: 7
Stream Width: 4.70 m
Total Discharge: 0.33 m^3/s
Total Area: 1.11 m^2
Mean Depth: 0.24 m

Measurement Results:
Station     Location (m)      Method      Depth (m)   Edge Factor Surface
(m/s) 0.2 (m/s)   0.4 (m/s)   0.6 (m/s)   0.8 (m/s)   Bed (m/s)   Average
Velocity (m/s)    Area (m^2) Flow (m^3/s)
1      0.00  0 point     0.21  0.70  0.00  0.00  0.00  0.00  0.00  0.00  0.00
       0.05  0.01
2      0.50  2 point     0.22  -     0.00  0.36  0.00  0.00  0.28  0.00  0.32
       0.11  0.03
3      1.00  2 point     0.26  -     0.00  0.34  0.00  0.00  0.33  0.00  0.33
       0.20  0.06
4      2.00  3 point     0.27  -     0.00  0.41  0.00  0.36  0.28  0.00  0.36
       0.40  0.14
5      4.00  2 point     0.20  -     0.00  0.26  0.00  0.00  0.21  0.00  0.23
       0.25  0.06
6      4.50  2 point     0.20  -     0.00  0.13  0.00  0.00  0.12  0.00  0.13
       0.07  0.01
7      4.70  0 point     0.19  0.70  0.00  0.00  0.00  0.00  0.00  0.00  0.00
       0.02  0.00
```

16									
17	Filter: FPA Parameter: 30 s								
18	Pre-filter: On Rank: 5								
19	EMI: 50Hz.								
20									
21	Station Entry: Non-fixed								
22	Flow Calculation: Mid-section								
23	Start Edge: Left edge water								
24	# of Stations: 7								
25	Stream Width: 4.70 m								
26	Total Discharge: 0.33 m^3/s								
27	Total Area: 1.11 m^2								
28	Mean Depth: 0.24 m								
29									
30	Measurement Results:								
31	Station	Location (m)	Method	Depth (m)	Edge Factor	Surface (m/s	0.2 (m/s)	0.4 (m/s)	0.6 (m/s)	0.8 (m/s)
32	1	0.00	0 point	0.21	0.70	0.00	0.00	0.00	0.00	0.00
33	2	0.50	2 point	0.22	-	0.00	0.36	0.00	0.00	0.28
34	3	1.00	2 point	0.26	-	0.00	0.34	0.00	0.00	0.33
35	4	2.00	3 point	0.27	-	0.00	0.41	0.00	0.36	0.28
36	5	4.00	2 point	0.20	-	0.00	0.26	0.00	0.00	0.21

DATA DOWNLOAD AND REVIEW



Open you measurement in Qreview Version 3.0.9.8 for data post-processing.