RowX – modelB outdoor

Operating Instructions
(rev 1.23)

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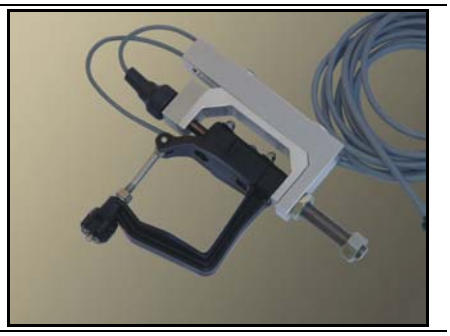
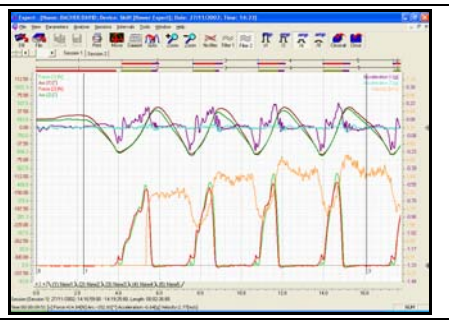
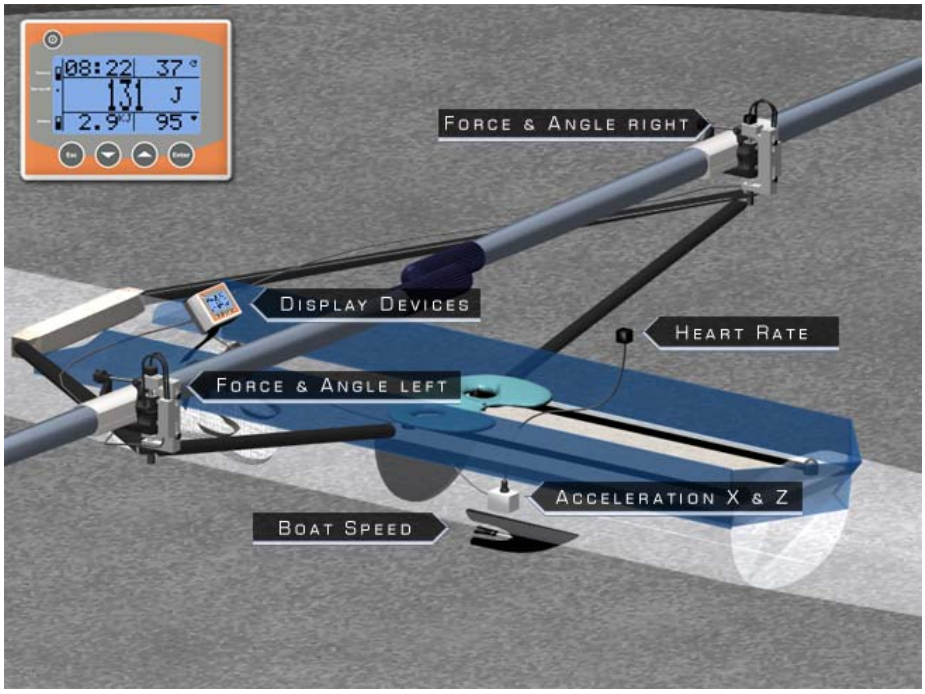
Sensored Oarlock	• Oarlock with implemented force and angle sensors	
Oar bending sensor	• Force and angle sensor for fixing on oar	
Sensored Box	• Box with acceleration, speed and heart rate sensors	
EXPERT	• Monitoring and analyse software package	

Introduction

The **RowX-modelB outdoor** is a tool with several measuring instruments that provides a detailed picture of boat movement, a rower's individual performance, or his/her performance compared to another crew member.



RowX-modelB outdoor can measure: force exerted by each rower, rotation angle of each oar, boat speed, boat acceleration in X and Z axis and heart rate (optional). They can be presented in a certain time interval, monitored, and compared on a standard personal computer using **EXPERT** software package. From the obtained signals it becomes possible to calculate the most relevant information for the rower exerted power under different training conditions or during competitions. Simple use with most types of rowing shells and oars, enables a rower to observe the measurement data on his/her own boat and with his/her own oars.

This data is sufficient for studying in detail the harmony of the individual's movements and forces, the differences in performance, successful training results, correct boat rigging, and many other things. It is also possible to compare the acceleration of the boat with the power and velocity curves of the individual rowers.

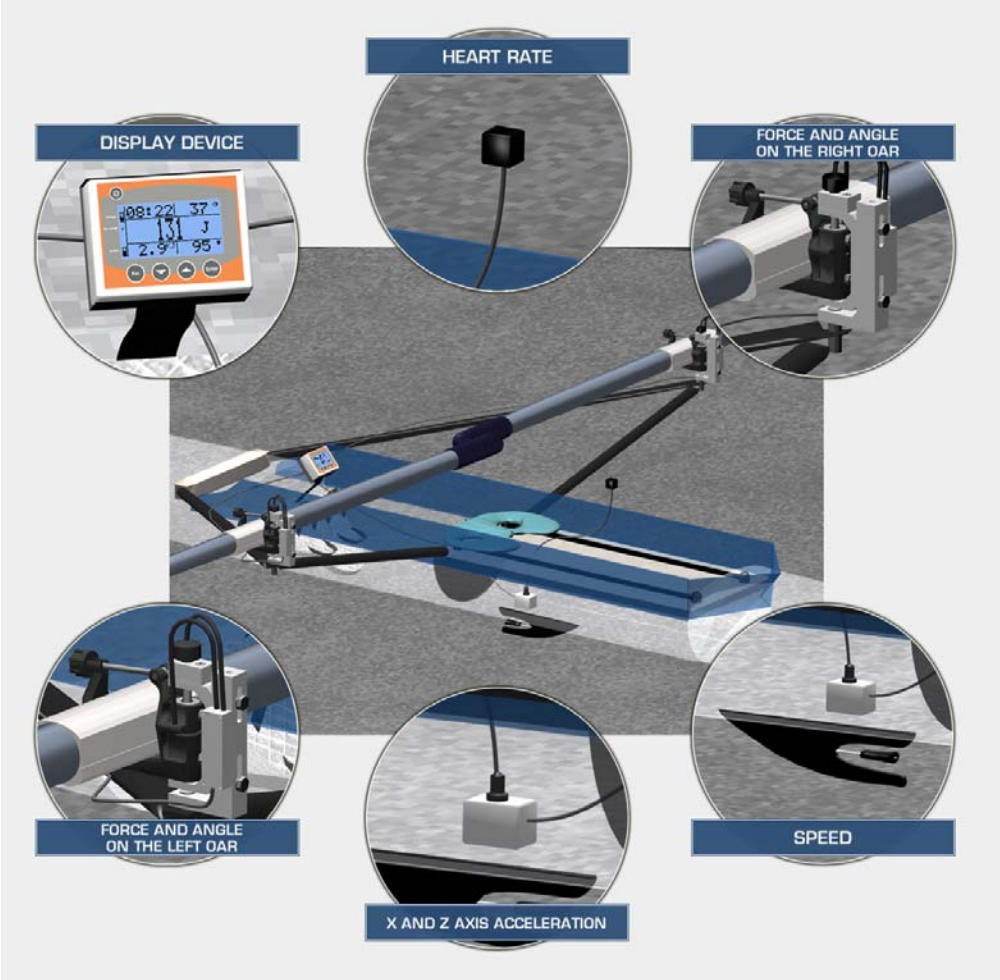
IMPORTANT:

Because of complexity of measuring components of RowX device we suggest that, before any attempt of mounting and starting a device, get familiar with manual and all of its components. Please be sure that any attempt to mount or start the device without a proper procedure could cause a severe damage to RowX device and measuring parts, which would lead to unnecessary costs of repairing.

What is measured and recorded by the RowX-modelB outdoor Display Device

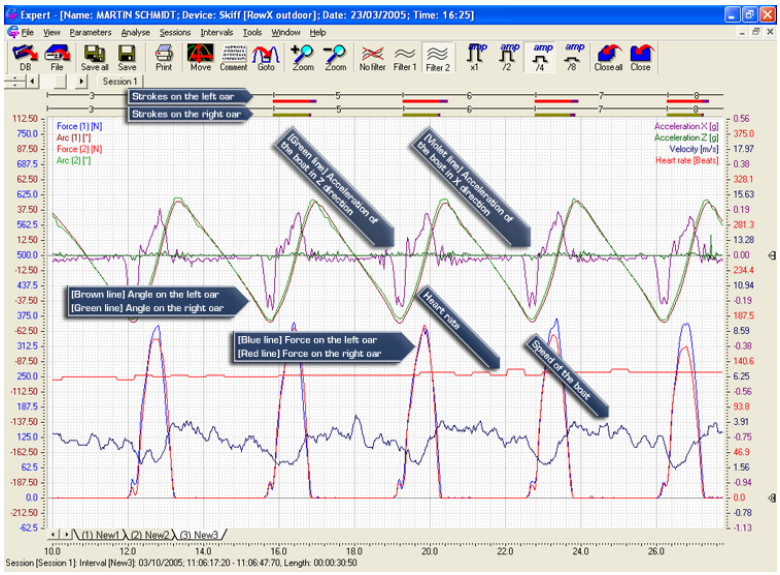
Following values are measured, acquired, and saved for a desired time period:

- Force exerted by each rower
- Rotation angle of each oar
- Boat Speed
- Boat Acceleration in X and Z axis
- Heart Rate (optional)



The **RowX-modelB outdoor** Display Device provides feedback of measured data per stroke. The computer takes 100 measurements per second, averages those numbers over the duration of one stroke, displaying and saving them. It is possible to recall 30h of training [averaged over 1-10 minutes].

All measured parameters could be memorised in Display Device memory and downloaded to PC for analysing in detail over 90 parameters per oar using **EXPERT** software.



Benefits of the RowX-modelB outdoor

- The **RowX-modelB outdoor** is extremely easy to install and even easier to operate
- The athlete can follow the efficiency of each stroke on the display
- Force is measured for left and right hand separately (symmetry control)
- The graph display is large enough to allow all of the important data to be viewed at once
- Complete biomechanical analysis is done by **EXPERT** software package
- The **RowX-modelB outdoor** provides laboratory conditions during training or race, so you will no longer lose data due to outside interference
- Use **RowX-modelB outdoor** for logging your workouts due to increasing training efficiency
- Use two or four units for bigger boats
- reliability of the sensors, small weight of the equipment, simple handling are further advantages

Package Includes

- Display Device (Central display unit)
- 2 Sensored Oarlocks (2 Scull or 2 Sweep)
- Sensored Box (Acceleration, Speed, Heart rate (optional) sensors)
- Battery charger
- Serial cable
- CD ROM with PC software (**EXPERT**) for Win98/ WinME/ Win2000/ WinXP

Technical Data Of The Display Device

- Dimensions: 110 x 85 x 45 mm
- Weight: 320 g
- Water drop resistant housing
- Sampling rate: 100, 50, 25, 10 samples per second
- Operating time: 25 hours (rechargeable batteries)

Minimum PC Requirement

- Processor: Pentium (Intel, AMD) > 433MHz
- Memory: 64MB (minimum), > 128MB (optimum)
- Storage media: 40GB hard disc
- Resolution 1024x768
- USB port
- OS: Windows 98, Me, 2000, XP
- Recommended: Laptop or desktop PC with multimedia configuration, rewriteable media (CD or DVD writer)

Battery Charge

If the indicator on the Display Device is indicating Battery low (empty bar), the device has enough power for about 30 minutes. Battery charging is completed with the Microcontroller Quick-Charger that performs controlled charging.

While charging, red LED is switched ON. After the charging procedure is finished, the charger automatically switches over to trickle charge, (green LED on, red LED off).

Charging time is ca. 4 h, if a battery is empty. There is no memory effect, so that the charging is possible at any moment.

IMPORTANT! Display device must be switched OFF before battery recharge is started.

Sensors

System is equipped with sensors for measurement of:

- The force and angle of the oar
- The boat acceleration
- The boat velocity
- Heart Rate (optional)

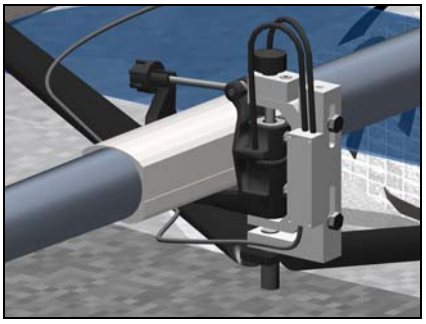
Force and Angle

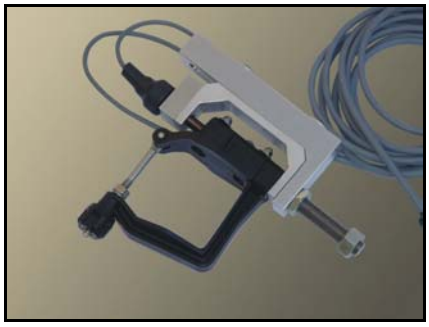
Two type of force and angle sensors are available: Sensored Oarlock and Oar bending sensor. Functionally there are the same, but measuring the force on different way.

Sensored Oarlock: Sensors are fixed in the oarlock, which is placed in a standard procedure. Sensor can be adjusted to different height and angle. With this kind of sensors, calibration is done only once by the producer, which means that, once it is placed on the boat, it is ready to be used. Basic package consists of 2 Scull or Sweep oarlocks (for Skiff 1x or Pair 2-).

WARNING

Unknowingly mounting and operating could cause a permanent damage to factory pre-set calibration. Please be sure that you have read and understand chapter SYSTEM MOUNTING.

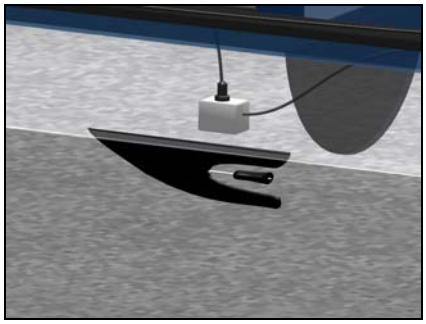




Oar bending sensor: Sensor, fixed on the oar, measures the force used by measuring the deformity of the oar. With this type of sensor, force calibration should be done each time after placing the sensor on the oar. By a simple change of the plastic holder, the sensor can be used on the scull or sweep oars. In this case, sensor measuring the angle is placed on the pin.

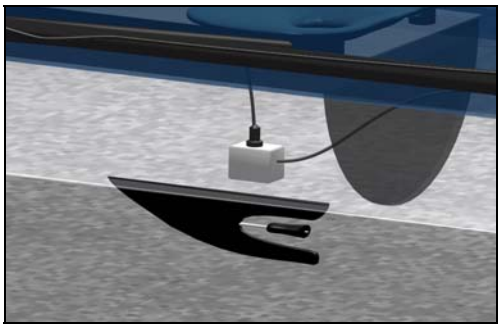
Speed

The boat velocity is measured in relation to water, using the impeller placed under the water surface. A signal from the impeller is transferred to the Sensored Box, placed close (max 2cm) from the impeller inside of the boat. Further on, Sensored Box is connected via cable to the Display Device (on the Speed Plug).



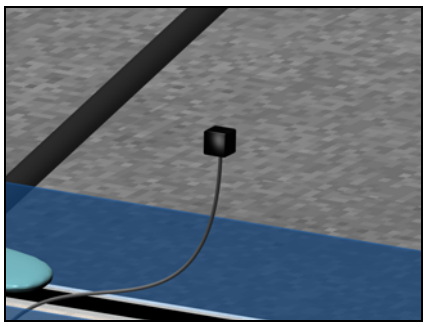
Acceleration

The acceleration in X and Z axis is measured with the sensor placed in the **Sensored Box** (Acceleration, Speed, HR).



Heart rate

The heart rate plug is situated on the upper part of sensored-box.



System Mounting

RowX-modelB outdoor Display Device has plugs for 2 Sensored Oarlocks. Every Sensored Oarlock has Identification number on his body, and must be pluged in responding place on Display Device. Last number indicates the position in boat (1,2), and should be connected to plugs Oar1 or Oar2 on **RowX-modelB outdoor** Display Device. For example, oarlock with number 6701051 has (1) as last number and should be connected to Oar1 plug, oarlock with number 6701052 has (2) as last number and should be connected to Oar2 plug.

Sensors switching [1 and 2] is not supported with this software version.

Mounting steps

- Mount the device on the boat.


- Replace the standard oarlocks with the Sensored Oarlocks. Prior to taking off standard oarlocks be sure to measure spread, height, and pitch so that the Sensored Oarlocks can be installed with the same values.



- Dismantle normal oarlocks by loosening all nuts and taking out pins

- Tighten Sensored Oarlock on the same position as standard oarlock.

Notice:

There are 2 bolts on oarlock, upper and lower.
Lower bolt is factory pre-set and it should never be moved by user in any way.

Allan bolts which goes through oarlock and shaft must run as smoothly as possible. Upper bolt from back side of oarlock must not be tightened in any way. It only needs to be locked to prevent shaft from having a space to make a loose end in ideal position. The bolt only needs to touch oarlock and not to have a strong grip. Uncorrectly adjusted Allan bolts may cause permanent damage of power calibration.

- Sensored Oarlocks are pre-set with 4 degrees pitch, and can be changed by tightening or loosening the two allen bolts.

WARNING!!!

In case of any mechanical tension between Allan bolt and nut the calibration of oarlock will be permanently damaged.

- Adjusting height and lateral pitch with the bolt on backside of oarlock.

WARNING!!!

The potenciometer on oarlock measure angle of oar moving through water. The calibration of angle is pre-set in production line and ensured in proper position. Make sure not to loosen or tighten nut in any circumstances. If in any way this nut is loosen please contact manufacturer.

- Put the cable around the outrigger construction and connect to Display Device.

NOTICE: ***When connecting oarlocks communication cables to RowX device make sure not to damage the cables in any way, because of potential weakness on water resistance or interrupting wires, which can lead to incorrect measurements or in some cases may cause the RowX monitor to stop working.***

Make sure that switch-craft connectors are locked not only plugged into monitor. Lock connectors by turning lock ring clockwise.

- Fix back arm with 6 mm bolt

IMPORTANT! Before turning device ON, sensores must be pluged in, because of initialization procedure, calibration coeficients and other data are read from memory in sensors

IMPORTANT! All unused plugs must be closed with protecting cap before training

Installing boat velocity sensor

- Choose mounting location

The impeller unit does not have to be on the midline of the boat, but must stay submerge while rowing. Make sure that the speed sensor cord will reach your chosen location and that you will be able to access the area directly above the impeller for mounting the speed sensor.

Mount impeller one of two ways:

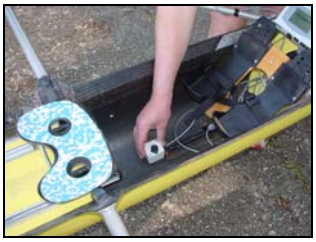
For a permanent mounting, use the double-stick tape provided. Clean hull surface and back of impeller unit thoroughly with alcohol pad. Let dry. Press impeller unit in place firmly.

For a removable mounting, use strips of electrical (easiest to remove) or packing tape. Clean hull surface and impeller unit flanges thoroughly with alcohol pad. Allow to dry.

- Connect Sensored Box with speed sensor to Display Device and switch it on.

- The Sensored Box is fastened to the inside hull, directly above the impeller. Best way is to fasten using double sided tape, and make sure that green light faces up. Green light is blinking during impeller turning. To find best position for Sensored Box, turn impeller with hand watching when the green light is blinking (sensored box must be connected with Display Device and device switched ON).

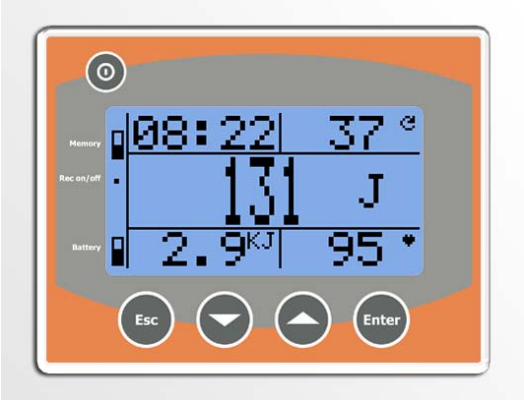
(IMPORTANT! cable coming out of sensor-box, should look in Display Device direction]



Performance Display Device

The Display Device is designed to be menu driven and self-explanatory. Via the menu system it's also possible to adjust all the parameters, to switch data recording ON/OFF, to choose the desired display during the work and to transfer the recorded data to a PC for further analysis in an easy and simple way using the **EXPERT** software package.

When the device is connected to a PC, it is possible to do the software adjustments, to memorize and to follow the complete work on the **RowX-modelB outdoor** in the REMOTE mode.



Display Device Main Characteristics

- Backlight
- Graphic display
- Rechargeable battery with about 25 hours of autonomy
- After switching ON, the last screen settings appear
- Navigate the functions using menus
- Display options including graphical or numerical data
- Time, Stroke rate, Power, Force, Angle, Work, Speed, Time/500m, Heart rate
- Choose from a variety of units - Power (W), Force (N), Angle [°], Energy (J), Speed [m/s] or Time/500m [s] - to be displayed with bigger fonts in the middle of the display. Switch between the units during a work out using UP/DOWN buttons
- Three modes for presentation of the measured and calculated parameters are available: TEXT, SIGNALS and GRAPH MODE
- Heart rate with Polar chest belt and receiver
- Pre-programming of workouts with time, rest time and numbers of intervals
- Store workout data on the board memory or just work without recording
- Recall function
- Memory, Battery status
- USB interface
- Real time monitoring on the performance monitor or PC
- The accuracy control or calibration is possible at any time with PC

Menu Structure

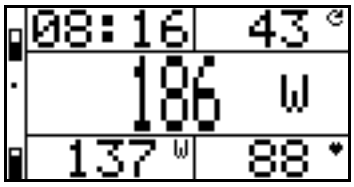
MAIN MENU

- **MAIN MENU**

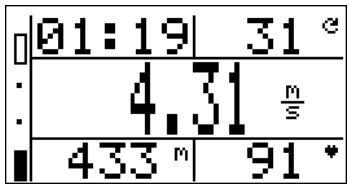
MAIN MENU / MONITOR

- Start monitoring
- (Use UP/DOWN buttons to change view mode)
- (When in Signals or Graph view, use ENTER button to change graph view mode)

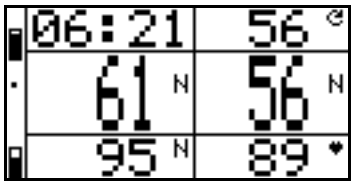
- **POWER (W)**



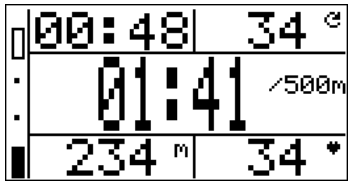
- **SPEED (m/s)**



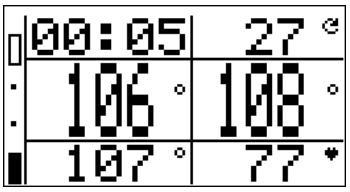
- **FORCE (N)**



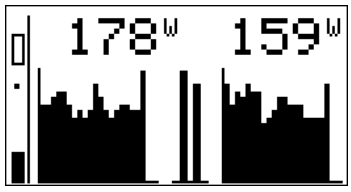
- **TIME/ 500m**



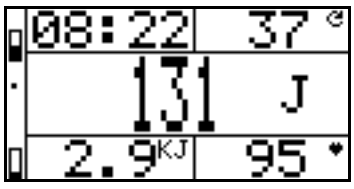
- **ANGLE (°)**



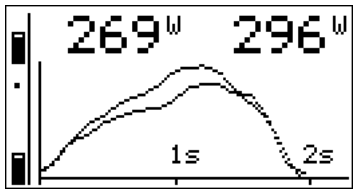
- **Graph**



- **ENERGY (J)**



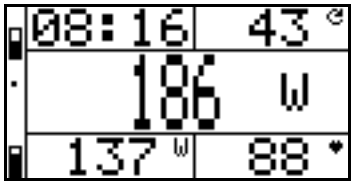
- **Signals**



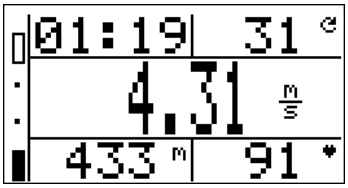
MAIN MENU / TRAINING

- Start training session defined in SETUP/TRAINING
- (Use UP/DOWN buttons to change view mode)
- (When in Signals or Graph view, use ENTER button to change graph view mode)

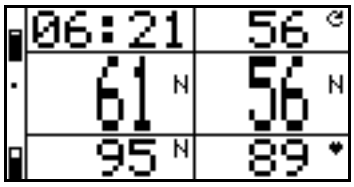
- **POWER (W)**



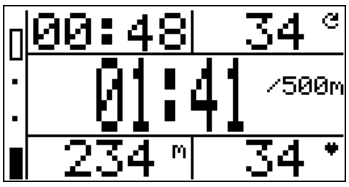
- **SPEED (m/s)**



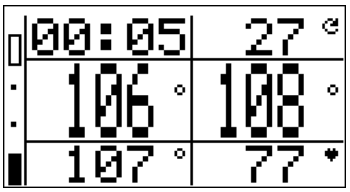
- **FORCE (N)**



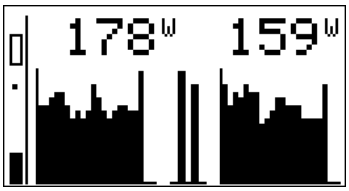
- **TIME/ 500m**



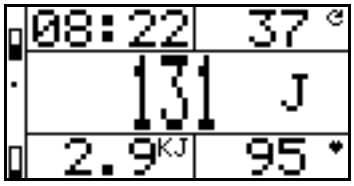
- **ANGLE (°)**



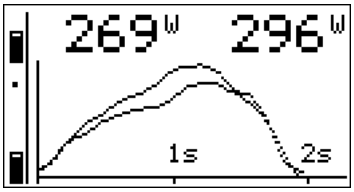
- **Graph**



- **ENERGY (J)**



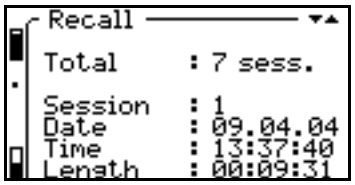
- **Signals**



MAIN MENU / RECALL

- Recall saved sessions
- (Use UP/DOWN buttons to select desirable recorded session (picture 1))
- (Use ENTER button to enter in selected session (picture 2))
- [Use UP/DOWN button to go through measured values in session [picture 2]]
- Upper left field [picture 2] represents current minute for calculated values (00-01 is the first minute of the training).

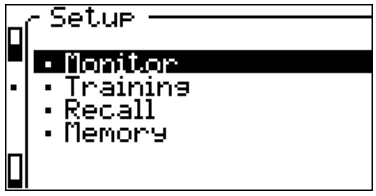
- **PICTURE #01**



- **PICTURE #02**

MAIN MENU / SETUP

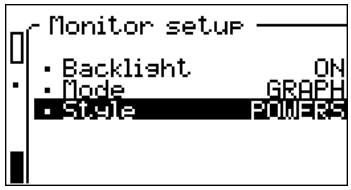
SETUP



MAIN MENU / SETUP / MONITOR

MONITOR SETUP

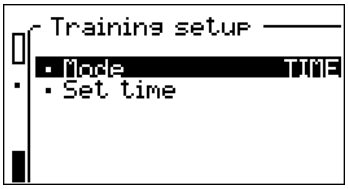
- Backlight (ON/OFF): switch backlight ON/OFF using ENTER button
- View mode (POWER, FORCE, ANGLE, ENERGY, SPEED, TIME/500m, SIGNALS, GRAPH): switch view mode using ENTER button
- Style (POWERS, FORCES, ANGLES, POWER-PULSE): In GRAPH and SIGNALS display, switch view mode using ENTER button

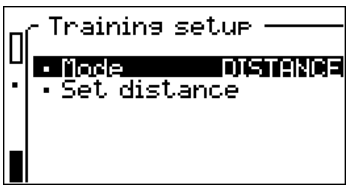


MAIN MENU / SETUP / TRAINING

TRAINING SETUP

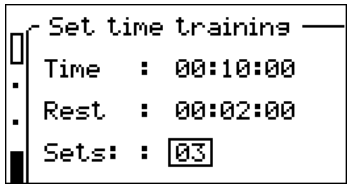
- Mode (Time/Distance): use ENTER button to switch Time or Distance mode





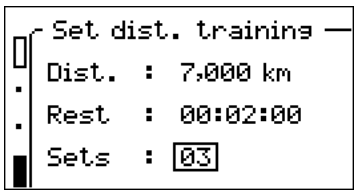
SET TIME TRAINING

- Work time: (up to 09:59:59) use UP/DOWN to select Work time, then press ENTER
- Rest time: (up to 09:59:59) use UP/DOWN to select Rest time, then press ENTER
- Sets: (up to 59) use UP/DOWN to select number of Sets, then press ENTER



SET DISTANCE TRAINING

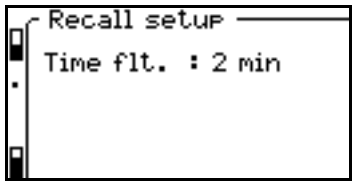
- Distance: (up to 250 Km) use UP/DOWN to select distance, then press ENTER
- Rest time: (up to 09:59:59) use UP/DOWN to select Rest time, then press ENTER
- Sets: (up to 59) use UP/DOWN to select number of Sets, then press ENTER



MAIN MENU / SETUP / RECALL

RECALL SETUP

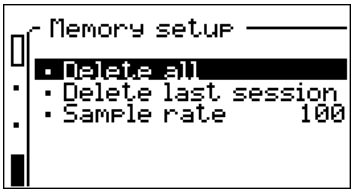
- Time filter: (1 to 10 min) use UP/DOWN to select time filter. This parameter is used in Recall function as a time interval for measured values averaging



MAIN MENU / SETUP / MEMORY

MEMORY SETUP

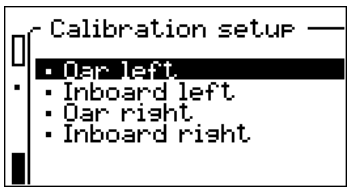
- Delete all: use this function to delete all saved sessions
- Delete last session: use this function to delete last saved session
- Sample/sec: switch sample rate or turn OFF sessions recording using ENTER button (10, 25, 50, 100, OFF)

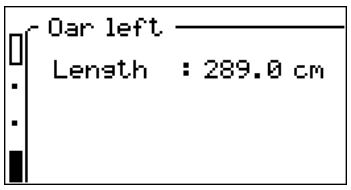


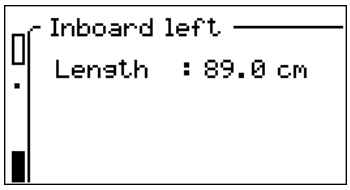
MAIN MENU / SETUP / CALIBRATION

CALIBRATION SETUP

- Use UP/DOWN button to choose parameter that should be changed (left oar or inboard, right oar or inboard). Afterwords press ENTER button to enter selected parameter
- Oar length : use UP/DOWN to set oar length in cm in steps of 0.5cm
- Inboard length: use UP/DOWN to set inboard length in cm in steps of 0.5cm







MAIN MENU / SET ZERO STATE

- Set ZERO values before starting measurements

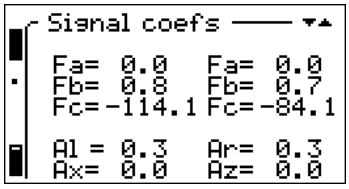
MAIN MENU / PROPERTIES

- Shows values of main parameters (use UP/DOWN to switch page)
- Software version: shows current version of display device software
- Device: connected oarlocks (Scull or Sweep)

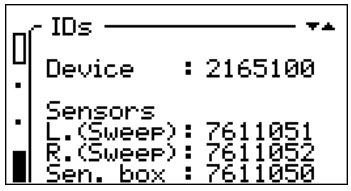
- Sessions: number of recorded sessions (0-255)
- Memory: memory status [% FREE)
- Training (dist./time]: shows selected training mode with parameters set
- Recall filter: selected recall filter time (0-10 min)

- **Properties**

- **Signal coefs**

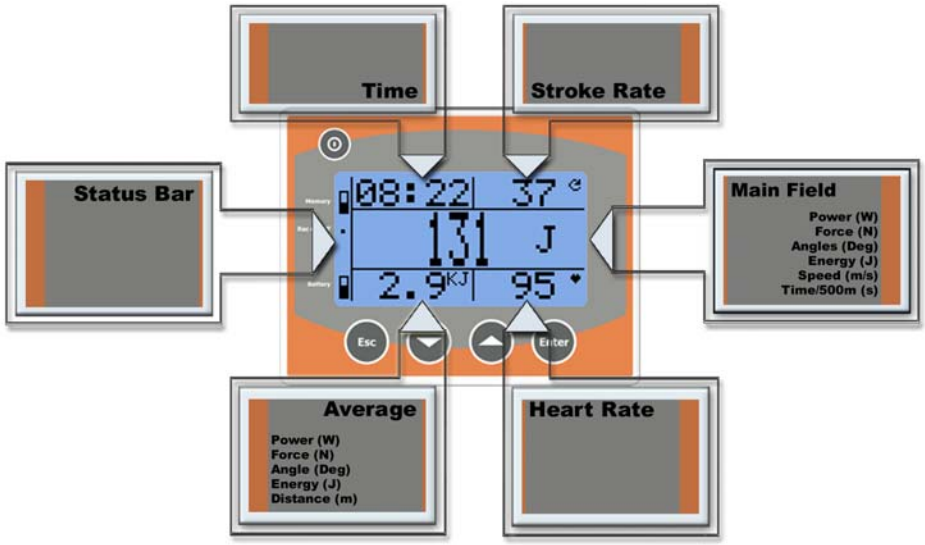


- **System**



Display Fields

Display Device is functionally organized. In the left part of the display is a Status Bar showing the most important device parameters (Memory and Battery status, recording ON/OFF indicator). Menu and measured parameters are showed in the main part of the display.



Using only 4 buttons in the right part of the display (ENTER, ESCAPE, UP, DOWN) it is possible to perform all the monitor functions. It makes working with the device easy and simple.

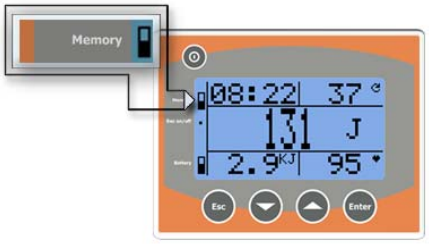
UP/DOWN	to move up and down in the MENU
ESC	to leave a selected option
ENTER	to activate a selected option

Status Bar

There are three indicators in the Status Bar (left side of display):

- Memory
- Rec on/off
- Battery

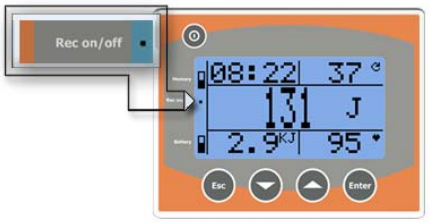
Memory indicator



Memory Indicator shows the momentary memory condition. It is presented in form of bar that is drown black in the case of full memory, or is empty in the case when memory is free (empty). Capacity depends of defined sampling rate.

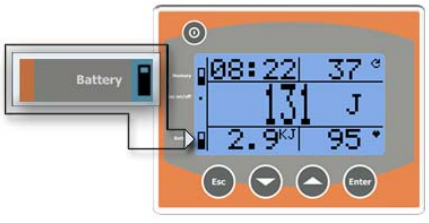
Sample rate	**High** (100 samples /sec)	**Medium** (50 samples/sec)	**Low** (25 samples/sec)	**Very Low** (10 samples/sec)
Capacity	**35'** (2100 sec)	**1h 10'** (4200 sec)	**2h 20'** (8400 sec)	**5h 50'** (21000 sec)

Record on/off indicator



Record on/off shows the state of signals recording. In the case when recording is switched on, in Status Bar is presented black point. When the recording is switched OFF, field near "Record on/off" mark in Status Bar, is empty.

Battery indicator



Battery Indicator shows the momentary battery condition. As in the Memory case, indication is presented with Bar. When the battery is full, bar is filled with black colour. In the other case (empty battery), Bar near "Battery" mark is empty. If the indicator on the **Display Device** is indicating **Battery low** (empty bar), the device has enough power for about 30 minutes.

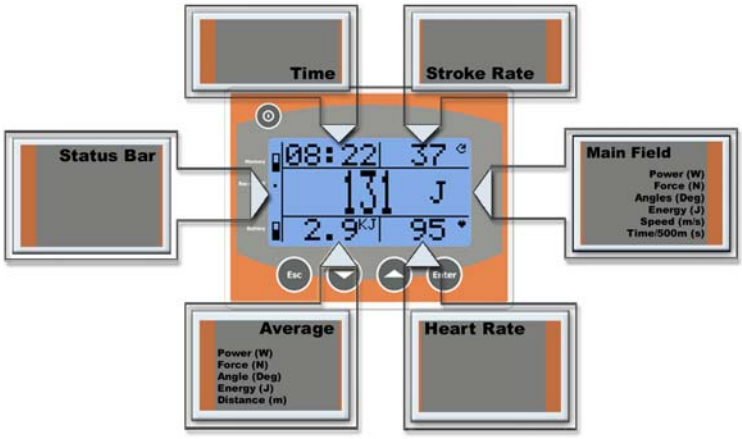
Display Device Modes

Two modes for the presentation of the measured and calculated parameters are available:

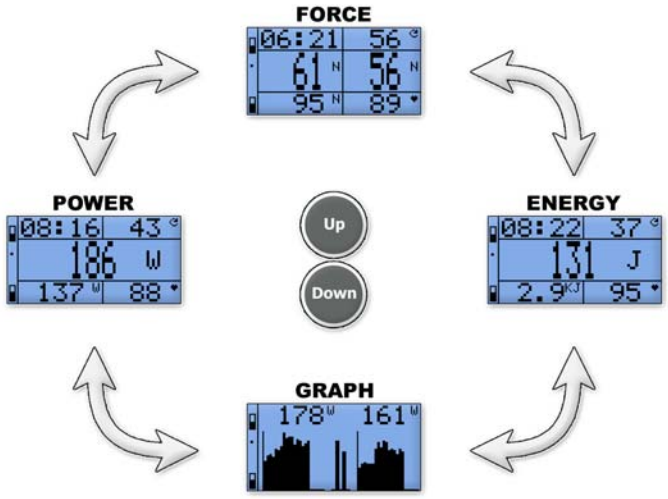
- Text mode
- Graph mode

Text mode

In text mode, it is possible to follow five parameters at the same time. Display is divided to more separated fields.



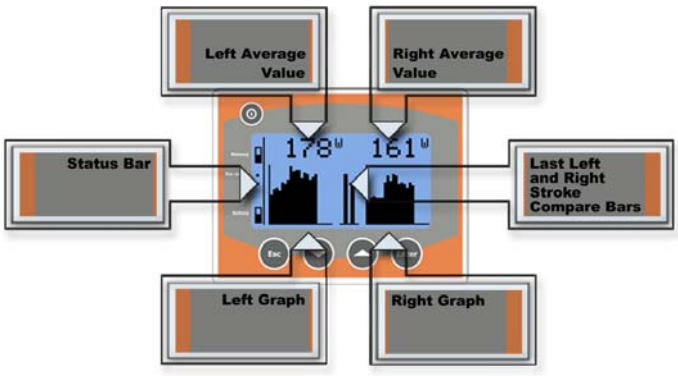
Time, **Stroke** and **Heart Rate** are standard fields that are presented in all text modes. Main and Average field could be switched to different views pressing UP and DOWN buttons.



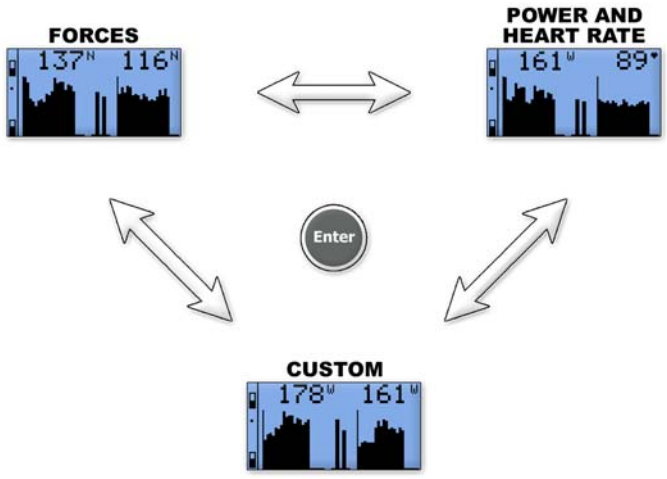
Following views are available: Power [W], Forces [N], Energy [J] and Graph mode.

Graph mode

In graph mode, two parameters can be followed at once. They are presented in Bar form.



In the upper part of the display (Left & Right Average Value) You find numerical values of the measured parameters (POWER, FORCE...) and these values are refreshed after each stroke. Left & Right Graph represent graphical interpretation of the measured parameter. Two bars at the middle of the display are presentation of the last stroke, shown separately to allow easy comparison of two sides (left & right force, left & right power etc.).

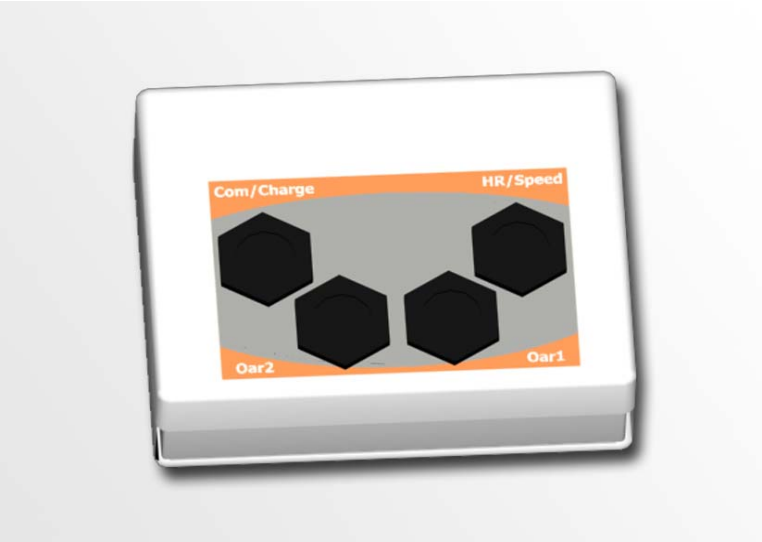


In graph mode, three different views are available. Two of them are predefined (Forces, Power & HR). The last one is Custom mode. Switching through views can be done by pressing ENTER button.

Plugs

Display Device is in the waterproof housing (IP65 protection), which guarantees a protection against sparkling water or against short-term (1-2 sec) immersing in the water. Connectors on the device are protected by the rubber covers, which guarantee a protection against water. It is necessary to remove the covers before the sensors are used and plugged in.

There are the following plugs on the backside of the Display Device:



- **Oar 1,2** - Force and angle sensor plugs (Oar1 represents left oar, Oar2 represents Right oar).

- **Com / Charge** - Plug for serial cable or Battery charger. Only one at the time can be pluged in.

- **HR / Speed** - Plug for **Sensored Box** (Acceleration, Speed, Heart rate sensor).

Some Rules Of How To Use The Display Device

- To turn the device **ON** or **OFF** press and hold the button **ON**/**OFF**

- Before turning device ON, sensores must be pluged in, because in initialization procedure (calibration coeficients and other data are read from memory in sensors).

- To enter a repeat mode (UP or DOWN commands are repeated constantly) press and hold the button UP or DOWN

- For lower battery consumption, turn the backlight OFF

SETUP >> MONITOR >> Backlight

Backlight - Press ENTER to switch ON/OFF

- If the **REC on/off** indicator (Status bar) is turned on, values with defined sample rate (10, 25, 50, 100 samples per second) will be memorized, starting with the 3rd stroke (the first two strokes are test strokes).

- To enable saving of the signals to memory, sample rate must be defined to one of the following values: 10, 25, 50 or 100. In this case, REC on/off indicator in the status bar will be turned ON (black POINT).

- The sample rate defines the memorizing status. To define this value go to:

SETUP >> MEMORY >> Samples/Sec

Pressing the ENTER button the sample rate will change (OFF, 10, 25, 50, 100) consecutively

Sample rate	**High** (100 samples /sec)	**Medium** (50 samples/sec)	**Low** (25 samples/sec)	**Very Low** (10 samples/sec)
Capacity	**35'** (2100 sec)	**1h 10'** (4200 sec)	**2h 20'** (8400 sec)	**5h 50'** (21000 sec)

- After 30 seconds of inactivity in the started session, the session will be automatically stopped.

- While in the monitor or training mode, use buttons UP/DOWN to change view mode (Powers, Forces, Angles, Energy, Speed, /500m, Graph, Signal).

- During a session in the Monitor mode, press the button ENTER if you want to change a graph or signals view mode (Powers, Forces, Angles, Power/HR)

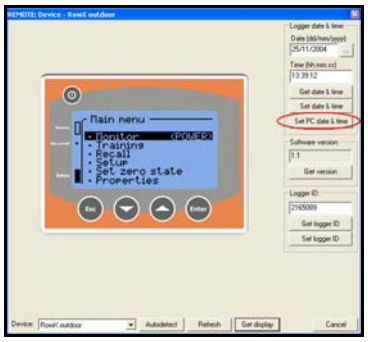
- To use the monitor only for training (without sessions recording) turn the recording OFF

SETUP >> MEMORY >> Samples/Sec

Samples/Sec - Press ENTER to select OFF option

- To follow and record a signal in the Real-time mode (Monitoring) by a PC in **EXPERT** software, connect the device with serial cable to PC, activate monitor or training mode on the Display Device and to start Monitor option in **EXPERT** software.

- To set a time and date on Display Device, connect the Display Device with serial cable to PC, switch the Display Device ON, start **EXPERT** software (REMOTE dialog) and press “Set PC date & time” button.



- To reset a system, press all four buttons in the PROPERTIES menu. After this press the button ENTER to reset or ESCAPE to cancel. When the system is reset, all the variables (Recall filter, Training definition etc.) get default values.

NOTE! RESET option is used ONLY if the system starts to work improperly

- If the system is inactive for 4 minutes, the device will be automatically turned off.

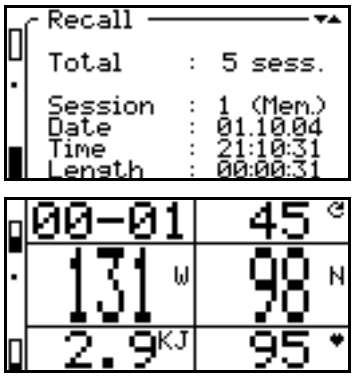
Memory Capacity

Data recorded during a session is saved in the Main memory. Its capacity depends on the sampling rate (table below). The Memory indicator in the Status bar shows the fullness of this memory.

Sample rate	**High** (100 samples /sec)	**Medium** (50 samples/sec)	**Low** (25 samples/sec)	**Very Low** (10 samples/sec)
Capacity	**35'** (2100 sec)	**1h 10'** (4200 sec)	**2h 20'** (8400 sec)	**5h 50'** (21000 sec)

This data can be transferred to PC for further analyse in **EXPERT** software.

The Recall memory has 30 hours capacity. Average values per minute of the following parameters (Power, Force, Energy, Stroke rate, Heart rate) are memorized in this memory. Data from this memory can't be transferred to PC. You can see this data only in Recall function.

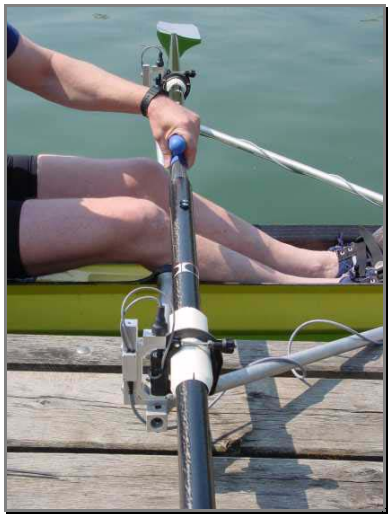


NOTE! Only sessions with the (Mem.) mark in the Recall can be transferred to a PC (picture below). If the Memory status (in the Status bar) indicates that memory is full, later recorded sessions will not have a (Mem.) mark and cannot be transferred to PC

Setting zero state

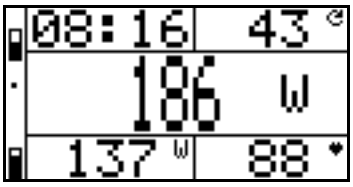
Before first use of the **RowX-modelB outdoor** system and also after some time of use (few weeks), it is necessary to predefine signals zero (offset) values for real conditions in boat. To do this follow the next procedure:

1. When the system is prepared (sensors and device put in their place) prior to starting, put oars perpendicular to boat (oarlocks should be put in the direction of the boat as ideally as possible). Do not move or make any force on oarlocks



2. Press command “Set zero state” in main menu on Display Device.

Preparing of the zero values, takes few seconds and after that the system is prepared for measurement. Enter MONITOR mode (command MONITOR in main menu) and start training session.

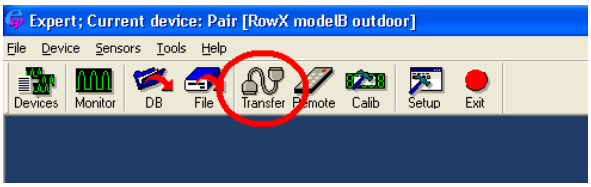


Transfer Of Data From Display Device To PC

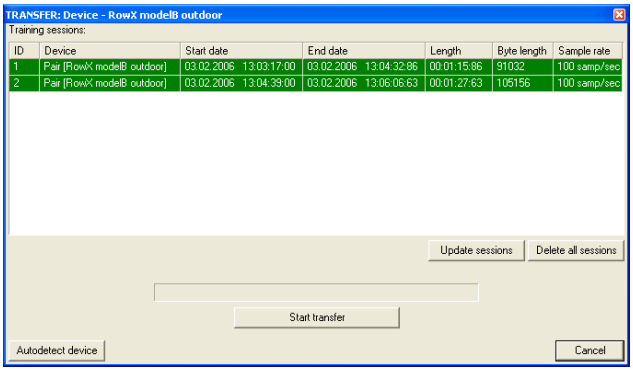
To download data from the Display Device use: Charge/Serial port plugged on one side and PC USB port plugged on the another side.

Use the following steps.

- Connect Display Device and PC with serial cable
- Switch Display Device ON
- Start **EXPERT** software
- Open transfer dialog

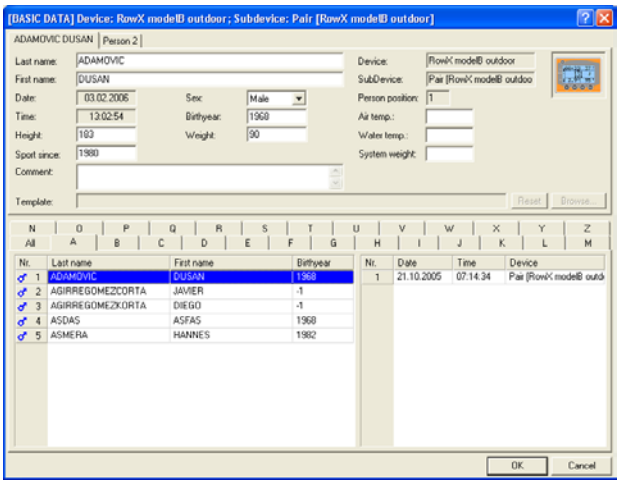


- After device is defined (autodetected), informations about stored data appear on the screen.



All the sessions memorized in **Display Device** are listed with the parameters of **Start** and **End** date as well as **Length** of the session.

- Select session(s) you want to download.
- Press button “Start transfer”. In the dialog “Basic data” it is necessary to put personal data and press OK button.



If the name is still in the list (left-down table), with double-click on wanted name, data will be automatically filled in all needed fields.

- After downloading, data is stored on your hard disc in Personal File. Personal files are in the directory, which is defined in the SETUP. Usually, that directory is in C:\WEBA Expert\PersonalFiles.

Personal Files are files with .pdb extension and contain all parameters of training. Personal Files names are standardised and formed as follows:

DEVICE NAME_PERSON NAME_DATE_TIME.pdb

The name of the file can give you the reconstruction of the basic parameters. For example:

ROWXB_OUT(SKIFF)_SMITH_JOHN_08042006_1309.PDB

The training is done on the **RowX-modelB outdoor** device (boat type – Skiff), the name of the person is JOHN SMITH, the file is created on 08.04.2006. at 13:09. Extension .PDB is an abbreviation for the Personal Database.

Speed calibration

Speed calibration should be done when the outside conditions for the parameters measurements in the water are changed. Whenever the measurement location is changed (another water conditions), it is necessary to calibrate the speed for the relevant conditions.

For speed calibration it is necessary to row once known distance (ex. 500m) and after that, do the calibration in post processing.

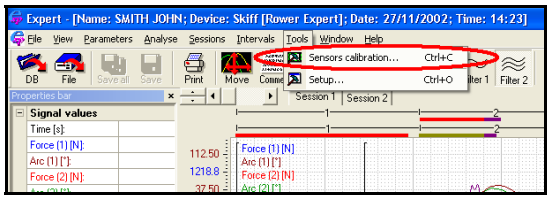
Following list describes the procedure:

- Put the boat to the distance mark
- Switch the Display Device ON and enter the MONITOR mode (command MONITOR in main menu)
- Make two strokes with oars out of water (on this way, recording of the session is started)
- Start rowing and row for example 480m, stop rowing and prepare your finger on ESC button
- Wait till boat come to 500m mark and than press ESC button to stop acquisition
- Transfer this session to PC using transfer procedure

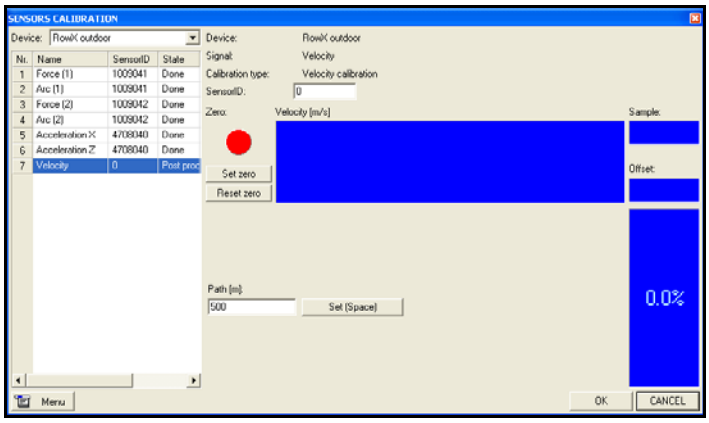
Speed calibration in post processing

After the session on the once known distance is recorded and the data are transferred to PC (Personal File made), the speed should be calibrated. For this process use the following procedure:

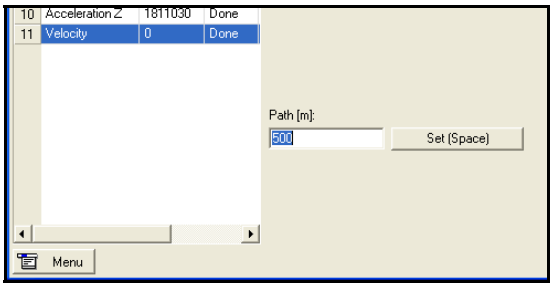
- Open the Personal File with the data recorded on the known distance (MENU: File – Open personal file from the database), in the software package **EXPERT**,
- If there are more available sessions, choose a session recorded on the known distance
- Call a dialog “Sensors calibration” (MENU: Tools – Sensors calibration)



- Select signal “Velocity” in the dialog “Sensor calibration” (in the signal list - left chart)



- Fill in the distance, that is already crossed in that session, in the field Path [m] and then press the button Set (Space)
- Close the dialog “Sensors Calibration” pressing the button OK



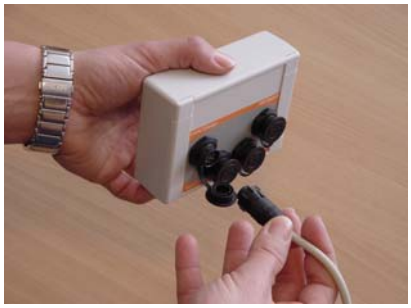
In this way the speed calibration for the particular conditions is done. This calibration is valid for all future measurements till the outside conditions for the parameters measurements in the water are changed.

Transfer of calibration coefficients to RowX-modelB outdoor Display Device

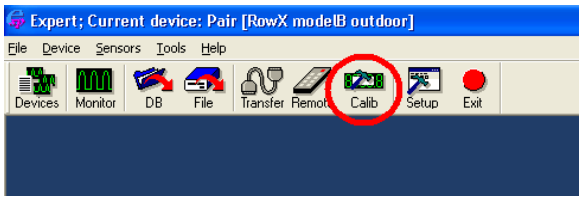
In the case when the new calibration of the force and length sensors has been done, it is necessary to transfer the new calibration coefficients to Display Device (before doing this, consult WEBA company).

Calibration coefficients are coming in file with .CDB extension. To complete transfer, please follow the next procedure:

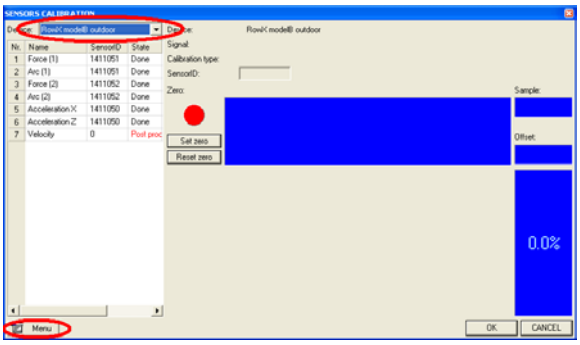
- **Connect Bending sensors to display device !**
- Switch the Display Device ON.
- Connect Display Device & PC with serial cable



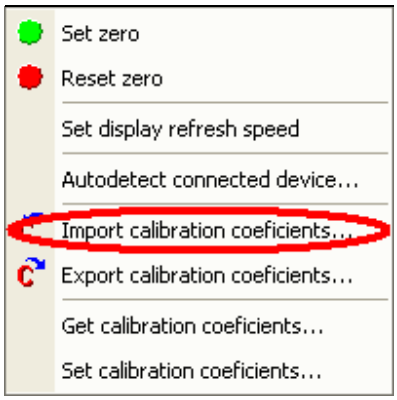
- Start **EXPERT** software and go to “Calib dialog”



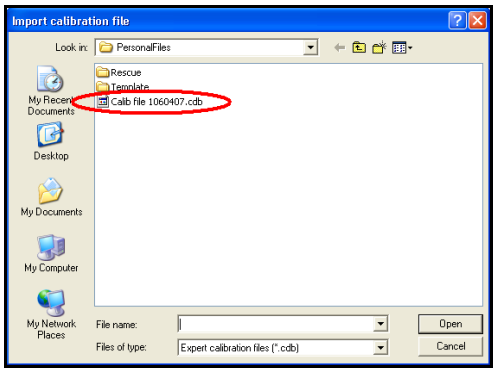
- In calibration dialog, select **RowX-modelB outdoor** in Device combo box, then press the down-left button “Menu”



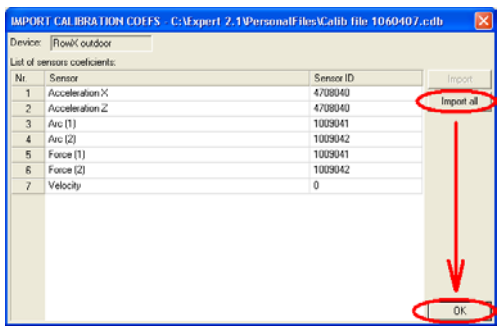
- Call “Import calibration coefficients” function



- Open calibration file with needed calibration coefficients (for example: “Calib_file_1060407.cdb”)



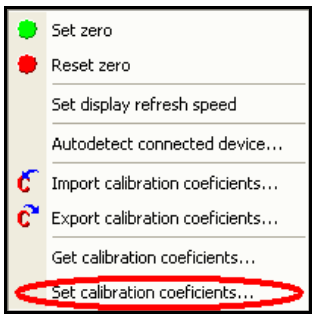
- Press “Import all” button and than “OK”



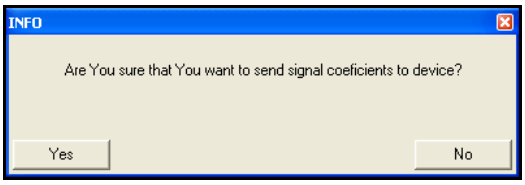
With this procedure coefficients are imported in **EXPERT** software. Next step is to transfer the coefficients to **RowX-modelB outdoor** Display Device.

- Go to **"Properties"** menu on Display Device
- Go to **"IDs"** menu (UP button)
- In **"IDs"** menu, press all 4 buttons (ESCAPE, DOWN, UP, ENTER) at the same time. On this way, device is ready to accept calibration coefficients

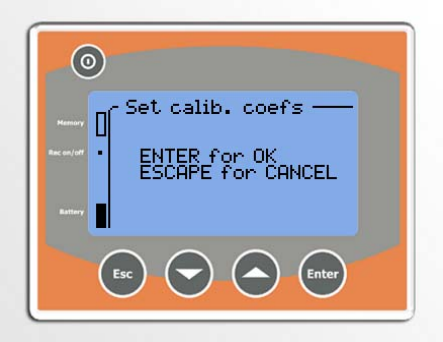
- In calibration dialog press the down-left button "Menu"
- Call "Set calibration coefficients" function



- Press OK button in next dialog



- On the Display Device, press Enter button



With this, procedure of calibration coefficients is completed. After all, it is needed to do Set zero on the machine (“Set zero state” in main menu on the Display Device) and the system is ready for use.

Troubleshooting

Symptom:	Possible Cause:	Remedy:
The Display Device is off and won't come on.	Damaged charger cable. Empty or dead batteries.	Try to recharge the batteries. If this does not work, call WEBA company.
Polar belt and a receiver are connected, but there is no pulse signal.	Distance between the belt and the receiver is too long.	Reduce the distance between the belt and the receiver.
There is no speed signal.	Distance between **Sensor-ed Box** (in boat) and impeller is too long.	Repeat “Installing boat velocity sensor” procedure.
During training a device does not show values in the monitor or training mode.	Offset values lost.	Define the offset values again. Put oars perpendicular to boat, do not move or make any force on oarlock. Call “Set zero state” command on Display Device.
Session is not recorded	Check Memory status and if the option **REC on/off** in the Status bar is activated	If the option **REC on/off** is not activated, activate it in the SETUP >> MEMORY >> Sample/Sec (press the button ENTER and chose 100, 50, 25 or 10 sample\sec). If the memory indicator shows that a memory is full, delete a memory: SETUP >> MEMORY >> Delete All (or Delete Last Session).