# RIVERUATCHER

# Fish Counter

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	8.7.2008 22:24:00	106		Up	0,21	11	1		
	9.7.2008 05:58:00	80		Down	0,34	19	1		
	12.7.2008 08:56:00	42		Down	0,81	37	1		
	12.7.2008 09:50:00	40		Up	0,81	6	1		
	12.7.2008 10:42:00	52		Down	0,83	12	1		
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	18.7.2008 09:24:00	95	57 Generic	Up	0,2	8	1		
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	22.7.2008 00:42:00	103				30	1		
		103	60 Generic	Down	1,28				
	22.7.2008 08:01:00			Down Up	0,26	10	1		
	22.7.2008 08:01:00 22.7.2008 08:43:00	100	59 Generic				1		

# **User Manual**

# for Riverwatcher PC Program

Version 4.33

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# **The Riverwatcher Fish Counter**

The Riverwatcher is a Fish Counter for use in fish ladders, barrier dams or other places where fish swim through a restricted passage. Various versions are available, and the counter can be adapted to local conditions in each individual instance. The Riverwatcher consists of a Control Unit with software, a Scanner Unit with cables, solar-panel, batteries and a computer program for processing the data.

The Scanner Unit can be thought of as a gate that is placed in the fish ladder. It controls the emissions of infrared light beams from the light-emitting one side of the Scanner Unit and the signals from the receivers on the other side of the unit.

When a fish swims through the Scanner Unit it interrupts the beams, the silhouette of the fish being used to count it and calculate its size. One cable runs between the Scanner plates, and there is one cable connecting the Scanner to the Control Unit. Data sent from the Scanner Unit to the Control Unit, which can then be transferred to a computer program, consist of: the height of the fish, the date and time it swam through the Scanner Unit, the temperature of the river, the results of a vision test which is carried out at regular intervals to check on the condition of the Scanner Unit's light-emitting diodes and a silhouette image of every fish so the counting's can be verified afterwards.

# 1. Getting started

The program can be reach at <a href="mailto:support@riverwatcher.is">support@riverwatcher.is</a> or on Riverwatcher webpage under Support. <a href="http://www.riverwatcher.is/Support/">http://www.riverwatcher.is/Support/</a>

Please select one of the options below before installing the program that fit your situation and after that follow the correct installation practice.

- 1. First time user or no data available.
- 2. You have previous data you want to upgrade with your program.

## Installation

#### 1.1.1 First time user or no data available.

Download program from webpage or via e-mail. When the program is run this window opens. This is done in four steps.

💽 🕶 🏄 🕨 Compu	ter + Windows7_OS (C:) + Program Files + vaki + Winari	• 69 Search Winari		٩
Drganize 🕶 Include	in library • Share with • Burn Compatibility files New folder		H •	
🖈 Favorites 📰 Desktop	DBImportExport Type Application	Date modified: 9.9.2010 11:12 Size: 1,80 MB		
Downloads	DBManager Type: Application	Date modified 9.9.2010 11:12 Size 3,01 MB		
Libraries Documents	Import existing data into new Winari database Author: Svemi Häkanarson	Date modified: 22:10:2010 15:27 Size: 75,8 KB		
Music E Pictures	Vic-0.8.6c-win32 Type: Application	Date modified: 12.9.2009 13:42 Size: 9,23 MB		
Videos	Winari Type Application	Date modified: 24.2.2011 09:32 Size: 4,40 MB		
Network				
5 items				

- Download program from webpage or via e-mail. VAKIWinari file is saved in Program file and under VAKI and Winari folder.
- Run winari\_setup. The type: Applicatio. Click on winari\_setup logo and run it.



 Then the following window should open. Make sure the Winariis installed to C:\Program Files\vaki\Winari. Then press next.









 The Program Folder should be Winari. Choose to install this application for either all user or just current user. Then press next.

5. The installing window will show up. Click next when the installation is finished.

6. Next select Run Winari now and press finish. Then the VAKIWinari is installed.

7. To active the video function of Winari it is necessary to install vlc. If this program is not installed Winari will show this error sign.

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Favorites	DBImportExport Type Application	Date modified: 9.9.2010 11:12 Size: 1,80 MB		
Downloads Recent Places	DBManager Type: Application	Date modified: 9.9.2010 11:12 Size: 3,01 MB		
Libraries Documents	Import existing data into new Winari database Author: Svemir Häkonarion	Date modified: 22.10.2010 15:27 Size: 75,8 KB		
Music Pictures Videos	VIC-0.8.6c-win32 Type: Application	Date modified: 12.9.2009 13:42 Size: 9,23 MB		
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5 items				





🛓 VideoLAN VLC media player 0.8.6c Setup
License Agreement Please review the license terms before installing VideoLAN VLC media player 0.8.6c.
Press Page Down to see the rest of the agreement.
GNU GENERAL PUBLIC LICENSE  Version 2, June 1991
Copyright (C) 1989, 1991 Free Software Foundation, Inc. 59 Temple Place, State 330, Boston, MA 02111-1307 USA Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.
Preamble
The licenses for most software are designed to take away your
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install VideoLAN VLC media player 0.8.6c.
Nullsoft Install System v2.27-2

8. To install vlc open the vaki\winari file og to Program files\Vaki\winari select Vlc to install.

- 9. Then Installer Language window will show up. Select language.
- 10. Click on next to continue on the welcome to Video LAN VLC media player setup window.

11. Agree the License Agreement by clicking next to continue.

# Show Readme

# Program Manual

VideoLAN VLC media player 0.8.6c Setup

 Obose Components
 Image: Conservation of the statures of WideoLAN VLC media player 0.8.6c you want to install.

 Check the components you want to install and uncheck the components you don't want to install.
 Image: Check the continue.

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 Image: Check type of install.

 Or, select the optional components you winh to install.
 Image: Check type of install.
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 Or, select the optional components you winh to install.
 Image: Check type of install.
 Image: Check type of install.

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 31.5MB
 Description
 Image: Check type of install.

 Space required:
 31.5MB
 Position your mouse over a component to see its description.

 Vulleoft Install System v2.27-2
 Cancel

- - - ×

VideoLAN VLC media player 0.8.6c Setup

Ocose Install Location
Choose the folder in which to install VideoLAN VLC media player 0.8.6c.
Setup will install VideoLAN VLC media player 0.8.6c in the following folder. To install in a
different folder, click Browse and select another folder. Click Install to start the installation.
Destination Folder

Space required: 31.5VB
Space available: 192.9GB
Nullsoft Install System V2.27-2

< Back Install Cancel

VideoLAN VLC media playe	r 0.8.6c Setup			
Installing				4
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Show details				
Vullsoft Install System v2,27-2 –				
iuisorumistair system v2,27-2 —		< Back	Next >	Cancel
		< DdCK	Next >	Cancel



Visit the VideoLAN VLC media player Website

< Back Finish Cancel

12. Choose the Components select type of install is "Recommended" and then press next.

13. Choose Install Location and let the destination folder be C:\Program File\VideoLAN\VLC and press Install.

14. The installing window will show up. Just wait for the program to be installed. Press next when the Installation is finished

15. Select Run Video LAN VLC media player and press Finished.

1. Comport

To connect the computer to the frame without internet connection, usb serial convertor needs to be innstalled on the computer. Insert the usb converter CD that was deliverd with the with the frame. It is not from any specific producer so the installation could be sligtly different. Run the cd from the Removable Storage



🗸 🗣 🖶 Kontrol Panel 🕨	Hardware	e and Sound > • • 49 Search Control Panel
Control Panel Home System and Security	-	Devices and Printers Add a device Add a printer Mouse Price Manager
Network and Internet		AutoPlay Change default settings for media or devices Play CDs or other media automatically
Programs User Accounts	9	Sound Adjust system volume   Change system sounds   Manage audio devices
Appearance and Personalization Clock, Language, and Region Ease of Access	۱	Power Options           Change battery settings         Change what the power buttons do           Require a password when the computer wakes         Change when the computer sleeps           Adjust screene brightness         Change water brightness
	2	Display Make text and other items larger or smaller   Adjust screen resolution   Connect to a projector   Connect to an external display
	5	Windows Mobility Center Adjust commonly used mobility settings   Adjust settings before giving a presentation
		Lenovo's System Health and Diagnostics 😵 Check system health   🌚 Diagnose problems   🎯 View system information
		SmartAudio
	ø	Lenovo's Power Controls
	0	Lenovo's Airbag Protection Adjust protection settings

16. Check if there comperter er already insert.Go to control Panel\Device Manager\ dobble click in Device Manager.

- Director Marger

   Precessor

   Moders

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- Computer
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   Second Computer
   Properties

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   AutoPlay
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17. Select ports and see if there are Comm port there. If the are not you have to install it.

18. If the program is not installed insert the CD to the computer and run it.

19. Dobble click on Run Autorun and press yes on the Run button.

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PL2303 USB-to-Serial - InstallShield Wizard	×
Ready to Install the Program The wizard is ready to begin installation.	R
Click Install to begin the installation.	
If you want to review or change any of your installation settings, click Back. Click Ca the wizard.	ncel to exit
InstaliShield KBack	Cancel

20. For this Converter click on Install Driver

21. Press next on the wolcome window.

22. Select install to install the program.

# Program Manual

23. To finish the installation press the finish button.

24. To make sure the USB to serial program is installed go to the Device manager again and check it.

1.1.2 You have previous data you want to upgrade with your program.

# 1.2 Installing newer version

Import existing data into new Winari database



1. If there are upgrading Winari and have already winari data you need to import exsisting data into the new data base that is done with the program DBimportexport.





2. Choose Import tables from DBE/ODBC and press Next

port Aliases:	Select tables to import: 100ary.db	
BLocal inari IS Access Database xcel Files BASE Files	100sort.db 100str.db 100tdt.db 100vsb.db	<b>.</b>
BASE Files ocalServer Itreme Sample Database Itreme Sample Database 200 uperOfficeCRM5 uperOffice	101arv.db 101sort.db 101strt.db 101tdt.db 101vsb.db 102arv.db	
uperonice	102sort.db 102str.db 102tdt.db 102vsb.db	
	102str.db 102tdt.db	~

Absolute Database Import / Export Tool

 Select new or existing database file to import to:
 winari abs
 (Winari abs
 (Absolute Database file to import to:
 (Winari abs
 (Absolute Database file to import to:
 (Absolute Database file to:
 (Absolute Datab

 Choose Import using DBE Alias / ODBC DSN and press Next

4. Choose winari as import aliases and select all tables to import and click Next

Write winari.abs in the database file field and click next. The program will now import all Winari data into database. Click Finish. Now the data will be accessible in Winari.

# 2. Using the program

# 2.1 The Interface

The interface is easy to use and provides excellent overview over the collected data. Moreover it includes variety of tables and charts for viewing and analysing figures and numbers. The program interface is divided into four main fields;

- 1. Toolbar
- 2. The Silhouette Image Field The silhouette image field gives information about the size and form.

www.Files Connect Bigetings AG (Star ) @ Cousts Report 1 Dates

3. The Digital Camera Field

The digital camera field provides you with the possibility to distinguish

between different species and group the fish in predefined groups.

4. The Table / Chart Field

Shows detailed information on each fish. Five different charts shows the whole season, time of day, missing one, size graph and compare more than one season together.

# 2.2 The Toolbars

The main toolbar shows: counter, file, images, and about buttons. These buttons will be described in this chapter 3.1. The button toolbar is part of the silhouette image field and is described in chapter 4. Has a shortcut on the other toolbar except the empty window and the filter button.



# 2.2.1 Counter

#### New counter

Here can you add the counters that are used in the database of the program. They are given name, description, phone number and counter number.

#### Modify counter

Here can you modify the counters that are used in the database of the program. They are given name, description, phone number and counter number.

#### Delete counter

Here can you delete the counters that are used in the database of the program.

#### Export counter

Here can you export counter to another computer/user?

#### Import counter

Here can you import counter from another computer/user?

#### Create report

Here can you report that statistics of fish swimming up and down the river. Statistical graphs are also drawn up. The fish amount versus time.

#### Settings

This is used to change the name or size-range of the categories, choose other colours for the charts and set the communication port (COM port) to be used for data transfer to the computer. In addition the user can choose length/depth constant for each fish group. This constant is used to calculate the length of the fish by using measured depth. Under settings it is also possible to change some settings on the charts.

#### Exit

For exit and close down the program. This does not affect the work done in the database.

### 2.2.2 File

#### Add remove files

By adding files in the database the user is able to analyse silhouette images of each fish, and sort the fish in different groups by the look. It is possible to add several files to the same database, and make several databases for different counters. In this database it is possible to look at each single fish, in addition to other registrations such as depth, speed, position in the counter, swimming direction etc.

#### Connect

This function is used for download data from the control unit. When data is downloaded four types of file exist. Each with a different function and they are stored in the same folder. If the

#### Go to fish record

Select date to go to, to see counted fish in on that date.

#### Copy chart to clipboard

Here you can copy the active chart to the clipboard and then paste it if working with other documents.

*Copy Silhouette to clipboard* This module is used to copy silhouette to clipboard.

#### Print Chart

This module is for printing the active chart.

*Export to Excel* This module exports data to excel.

# 2.2.3 Images

#### Silhouette

Here you can able / disable the silhouette image field from the main program interface.

### Digital Camera

Here you can able / disable the digital camera field from the main program interface.

# 2.2.4 About

This gives information about the current edition of the program in use, and about VAKI.The Winari program is designed for Windows 95/98/W2K/XP and consists of following main modules.

# 2.3 The silhouette image field

To toolbar over the silhouette image field are shortcuts from the main toolbar except the filter button and the silhouette button. This chapter will go through the lower menu bar and the silhouette image field.

Bearse Front	•	Add Renuve I	the Corne	1 79.1	abrider	Est				
1 2 2063 17 58:00 hermat. Da 19	20	Depth part 141 30	Length (cns) 00 43	Positon 66 50	liceed(s/i) 0.36 60 70	60	50	100	aia	120
	_	<u>an san san san san san san san san san s</u>	-					0000089	200403497	
-						-				
-			~	-						
										- 1

# 2.3.1 The Window

Choose active river watcher.

### 2.3.2 Add/Remove files

It is possible to build a database for each fish counter created, and sort the registrations in predefined groups using the silhouette images of each fish.

When new data is downloaded into the program, press "Add/Remove Files" and the following is displayed. If the data from the Control Unit is downloaded every week, new sets of files are made every time (arv, img, tdt, vsb) and they together make the database. In this window you can remove or add new files (measurements) and comments. The "File nr:" is the number of the file that is being imported to the database.

M	◀ ▶	M	Add File	Remove File	Close
=ile nr:	Date from: 1 8.10.2009 11:	Date to	: 009 14:28:43		
Filename	\HeiðaJ\Desktop\Val	i 2010\2009 Home	ialSc1 obt		
Control		1 2010(2009 Hellis,	O(SCI_OKU		

# 2.3.3 Connect

#### 2.3.3.1. The files

The following four types of file are stored in the folder when data is transferred from the control unit.

**.arv**files, which contain data on the size of the fish, the time of registration and the direction the fish, were swimming and the position in the scanner frame. These are the main files for each record.

.imgfiles, which contains a silhouette image of each fish, this makes it possible to examine and sort all the fish recorded, and count them to check the numbers recorded automatically by the counter.

**.vsb**files, which contain data from the "visibility test", this can be used to check whether all the LEDs (light-emitting diodes) were functioning properly during the period when registrations were made. The storing capacity in the vsb file is 100 days.

.tdtfiles, which contains temperature records for the period, the temperature is recorded automatically every three hours, and the file can store 2.000registrations. The storing capacity in the tdt file is therefore more than eight months.

#### 2.3.3.2. Direct connection

To retrieve data from the control unit, connect it to the computer using the transfer cable and the appropriate COM port. Switch on the control unit and click the "Connect" option in the program. The following will appear on the screen.

Connected to Salmon River	×
Counter Clock	Counting Results
17. 3 .2011 💌 13:27:23 📫	Up Down Up-Down
Upload data from Counter	Large 0 0
Apprximated upload time is 0 sec. Total movements since Counter was last reset are 0	Small 0 0
<u>S</u> ettings	Total 0 0
DU and and a second sec	Counter last reset time
DU program version: 315 DU free memory: 100%	3/14/2011 11:50:00 A <u>R</u> eset Counter
Scanner not connected	
GSM signal strength	Upload Battery/Visibility Close

The date and time of the day on the control unit (DU Clock) will appear automatically under "Counter Clock". It is important to check if the DU clock and the date are right, if not it has to be changed.

"Counting Results" are displayed automatically, and shows the status on the control unit's display. It does not have to be the same numbers as on the file that is transferred, since it is possible to reset the control unit from the computer. That might be preferred if you want to show on the DU the total migration for the whole period, but the

	and the lateral films	Erasing data
Erasing data, Please wait	irasing data, Please wait	

memory is erased after each downloading. Counter last reset time shows the date and time of last reset.

By pressing "ResetCounter" *all data from the control unit is erased*. Do not erase data before all files are securely downloaded and saved. By pressing the "Battery/Visibility" button you can check the power on the battery, and also run a test that tells you if all the diodes are functioning right.

The green dots in the lower right corner indicate activity on the serial port. The following test is shown for each of the two diode-rows. In the example to the left everything is OK and nothing is blocking the diodes, but in the example to the right something is blocking the highest part of both diode-rows.

Battery and Visibility	Battery and Visibility
Upper scanner	Upper scanner
Lower scanner	Lower scanner
Battery: 12.8 ∨	Battery: 13.0 ∨

"View Data" shows in a graphical way the file that is being transferred from the control unit (see charts under chapter 3.5.). Under "Settings" you can choose which file types you transfer from the control unit, while pressing "Upload" starts the transmission. All files are given a name based on the name of the river and the date when the data is transferred; these may be altered as in other Windows programs. If the names are changed, then it is important that the four files from each downloading have the same name.

If the control unit is fitted with a telephone connection and a modem, then it is possible to dial up a connection at any time to download data from the control unit at any time or for regular checking. Insert the counters telephone number and press "Dial". When connection is made between the control unit



and the computer the picture from chapter 3.3.2 is displayed. All the functions are the same as with direct connection. When downloading big files via mobile modem, some problems may occur if the telephone connection is bad. Then it is better to download more frequently and erase the memory after each download.

# 2.4 Settings

This is used to change the name or size-range of the categories, choose other colours for the charts and set the communication port (COM port) to be used for data transfer to the computer. In addition the user can choose length/depth constant for each fish group. This constant is used to calculate the length of the fish by using measured depth. Under settings it is also possible to change some settings on the charts.

# 2.4.1 Size Groups

Use this option to change the names or size boundaries of the categories, and to determine which of them are to be displayed on the charts. You can also choose different colours to represent each category.

Settings			
ize Groups Communication	Categories Camera im	ages Charts Report settings	
Name Small Medum Big	Length up to Visible 40 € 70 € 100 € ✓	Color	
		Apply VK	X Cancel

# 2.2.1 Communication

In this window you can choose communication method, either through the serial port or a modem. You can also choose which COM port on the computer to use when downloading data and which port to connect the modem to if the counter has a built- in telephone.

Communication method © Direct © Modem —Directory	Com pots Direct pott 1 2 Modem port 1 2 Itolder for data files	River Watcher Uppe	Automatic upload G No C 3 min C 10 min C 10 min C 10 hour C 12 hours C 24 hours
---	---	--------------------	--

# 2.2.1 Categories

Here you can change the length/height ratio, which is used to calculate the length of the fish on the basis of their measured height. It is possible to use different constants for each size groups of the sorted fish groups. This may be desirable if there are different relations between depth and length between fish groups, and between size groups within fish

Size Groups   Communication Lelegones   Charts   Report settings	Settings	
Apply V Cancel	Categorie Name Sim Relative Up Down Length T Categorie Name Small Medium Big 6 Big 6	=
	Арріу 🗸 ОК 🗶 С	ancel

groups. It is also possible to set a relative constant for calculations of the length according to the swimming direction. If fish is calculated smaller on the way down then by changing this constant to e.g. 1.3 the program will calculate the size of all down fish 30% bigger. This can be appropriate if the fish has to jump into the scanner frame and therefore the shadow is deeper than the shadow of the same fish swimming down.

### 2.2.1 Camera images

In Camera images you can choose how many images are shown in the digital camera field of the program.

🔀 Settings			
Size Groups   Communication   Catego	ories Camera image	Charts   Report settings	
	Visible Images		
	🔽 Image 1	🔽 Image 6	
	🔽 Image 2	Image 7	
	🔽 Image 3	🔽 Image 8	
	🔽 Image 4	🔽 Image 9	
	🔽 Image 5	🔽 Image 10	
Automatically play video			
		Apply 🗸 OK	🗶 Cancel

# 2.2.1 Charts

#### 2.4.5.1 TIME CHART

Select the settings for the temperature shown in the charts, Celsius or Fahrenheit. Also it is possible to select daily average or measurements with three hour intervals shown. Activate the operating status to see the results from the VSB file on the chart. And under "Length Chart" It is possible to set their solution in the length chart.

	munication   Categories   Camera images [Charts]   Report settings   ime Chart   Length Chart   Print Margins   Temperature Visible C Celcius C Daily average C Fahrenheit	#) <u>- 0 <mark>= x</mark></u>
_	Coperating status	cel

#### 2.4.5.2 LENGTH CHART

To choose charts length resolution, change the value in the length Chart resolution (cm) window.

🨾 Settings	
Size Groups   Communication   Categories   Camera image	s Charts Report settings
Time Chart Length Chart Print Margins	
5 🔮	
	Apply VK X Cancel

#### 2.4.5.3 PRINT MARGINS

To change the charts placement on the reports choose the distance value on top, left, Right, bottom.

🤯 Settings	
Size Groups Communication Categories Camera images Charts Report settings	
Time Chart   Length Chart Print Margins	
Top 10 🚖	
Leit 10 单 Right 10 单	
Bottom 10 🚖	
Apply V OK X Cancel	

# 2.4.5 Report settings

To choose what information's are shown on the Reports go to Report settings. Available information's for the reports are: Counting tables, stacked chart, Time Chart, Migrating chart, Length Chart and Year comparison Chart.

😾 Settings		
Size Groups   Communication   Categories   I	amera images Charts Report settings	
Items to be incluted		
✓ Counting tables		
I Stacked Chart		
🔽 Time Chart		
V Migrating Chart		
🔽 Length Chart		
🔽 Year Comparsion Chart		
	Apply VK	Cancel

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# 2.4.5 Filter

In the program it is possible to work with the whole database or selected part of it by selecting the group from the "Categories". By "Time period" you can also choose a certain time period to look at. Select also the direction and size groups to look at in the charts.

Time period       Categories       Visible size groups         From:       Image: Generic       Image: Small         Set 21. 6.2010 ▼ Time       Image: Mot fish       Image: Generic         To:       To:       Image: Generic       Image: Generic         Set 2.10.2010 ▼ Time       Image: Generic       Image: Generic       Image: Generic         Show All       Image: Generic       Image: Generic       Image: Generic         Show All       Image: Generic       Image: Generic       Image: Generic         Show All       Image: Generic       Image: Generic       Image: Generic	Filter Settings		×
	From: Set 21. 6.2010 ▼ Time To: Set 2.10.2010 ▼ Time	Generic	✓ Small     ✓ Medium     ✓ Medium     ✓ Big

#### 2.5 Create Report

#### PRINT

Shortcut to print out reports.

2.5.1 EXIT



### 2.6 Silhouette

By pressing the silhouette button the silhouette field/screen shows, no silhouette, silhouette one silhouette two or both silhouettes at the same time.

# 2.7 Table field

The "Table field" beneath the silhouette image shows the date and time for each passing fish, the depth and calculated length (Depth x "Length/depth" ratio under "Settings") in addition to categories, swimming direction, speed, the position in the scanner and the number of the file in the database.

Under "**Categories**" to the left of the table, there is a possibility to sort the fish in different groups (species), using the silhouette image and other information from the data file. Under certain circumstances the counter can register some disturbances in the water surface or objects that are not fish. Then it is possible to go through the silhouette images and manually sort these registrations, either as "Not Fish" or delete them from the database.

The table beneath the silhouette image has four fields; Size/Time, Temperature, File records and Visibility.

Categorie		Date/Time	Depth [mm]	Length [cm]	Category	Direction	Speed [m/s]	Frame pos [cm]	storyindex
<ul> <li>Generic</li> </ul>		21.6.2010 17:53:00	87		Generic	Up	1,66	18	1
		21.6.2010 19:10:00	50	30	Generic	Up	0,92	21	1
		23.6.2010 12:21:00	157	94	Generic	Up	1,42	33	1
		23.6.2010 13:45:00	145	87	Generic	Up	0,59	32	-
- achene		23.6.2010 19:38:00	95	57	Generic	Up	0,95	33	1
		24.6.2010 11:59:00	160	96	Generic	Up	0,44	25	1
		24.6.2010 14:18:00	90	54	Generic	Up	0,97	16	1
		1.7.2010 08:48:00	170	102	Generic	Up	1,19	34	1
		1.7.2010 20:13:00	156	93	Generic	Up	0,56	28	1
		2.7.2010 11:46:00	50	30	Generic	Up	1,03	35	1
		3.7.2010 12:45:00	100	60	Generic	Up	2,14	27	1
		3.7.2010 15:52:00	135	81	Generic	Up	0,76	24	1
O Not fish		3.7.2010 22:22:00	92	55	Generic	Up	0,76	33	1
		4.7.2010 07:01:00	150	90	Generic	Up	0,77	29	1
		4.7.2010 08:53:00	110	66	Generic	Up	1,28	5	1
		4.7.2010 10:46:00	125	75	Generic	Up	0,88	26	1
	-10	4.7.2010 12:29:00	177	106	Generic	Up	0,97	38	1
		4.7.2010 17:36:00	132	79	Generic	Up	1,12	33	1

## 3.7.1.Size/Time

The first field shows the date and time for each registration. "Depth" shows the scanned height of the fish in mm, "Length" shows calculated length in cm (Depth \* L/D ratio for actual size group), "Category" shows in what group the fish was sorted, "Direction" shows the swimming direction, "Speed" is shown in m/sec, "Frame pos." shows the position of the fish in the scanner frame, e.g. the number of the uppermost diode used to draw up the silhouette image of the fish. The diodes are 96 in each row, no. 1 is at the top, and no. 96 is at the bottom. "File nr" shows which file in the database you are working with. It is possible to sort the database by pressing the top of any column, e.g. by size or direction. It is also possible to select many fish at the same time (mark them blue) if the database is being sorted. Just hold down the Ctrl button while selecting lines with a mouse-click.

# 3.7.2. The temperature

field shows the date and time for each temperature registration, "Temp" shows the electrical value from the scanner used for calculating the temperature in Celsius or Fahrenheit shown in "Calc Temp", and "File nr" shows which file in the database you are working with.

Si	ize/Time	Temperature	File records	Visibility		
	DateTime	e	Temp	calctemp	storyindex	
	2.10.201	0 18:00:00	30	6	1	
	2.10.201	0 21:00:00	29	5,8	1	
	3.10.201	0	29	5,8	1	
	3.10.201	0 03:00:00	29	5,8	1	
	3.10.201	0 06:00:00	29	5,8	1	
Þ	3.10.201	0 09:00:00	28	5,6	1	
	3.10.201	0 12:00:00	29	5,8	1	
	3.10.201	0 15:00:00	29	5,8	1	
	3.10.201	0 18:00:00	28	5,6	1	
	3.10.201	0 21:00:00	28	5,6	1	

**3.7.3.** "File records" contains the counting result from each file that make the database, and information on measuring period, comments and where to find the file.

Size/Time Temperature File records Visibility										
Indexin	Startdate	Enddate	MissStartdate	MissEnddate	Salmup	Salmdown	Troutup	Troutdown	BatteryV	comments
1	11.6.2010 15:59:00	15.10.2010 14:16:00			800	4	441	1	0	1

### 3.7.4. The"Visibility"

field shows if the light emitting diodes have been functioning right during the period.

Each line represents one day, and Scanner 1 and Scanner 2 have one column each. If the value is 0 the diodes are functioning right, but other numbers show which diodes have been blocked for more

Si	Size/Time Temperature File records Visibility								
	DateTime	vsb1	vsb2	batt	storyindex				
	24.9.2010	0	0	56	1				
	25.9.2010	0	0	58	1				
	26.9.2010	0	0	60	1				
	27.9.2010	0	0	61	1				
	28.9.2010	0	0	62	1				
	29.9.2010	0	0	63	1				
	30.9.2010	0	0	62	1				
	1.10.2010	0	0	61	1				
	2.10.2010	0	0	61	1				
Þ	3.10.2010	0	0	63	1				

than 30minutes in one - hour period. "Battery faults" can either show 0 or 1, where 0 means that the Voltage has been higher than 11.2 Volt, while 1 means that the Voltage has fallen under 11,2 V. This test says nothing about how long the Voltage has been under the limits; only it has been under for some period that particular day. "File nr" is as before to show which file in the database you are working with.

## 2.8 The Chart field

By pressing "Charts", the chart- module is opened, but only for the sort-categories (Generic, Not Fish, etc.) or/and the period that is active in the database (set under "Filter"). For more details see chapter 3.7.

## 3.8.1 Stacked Chart

This chart shows the migration patterns of the fish, either for the full period or over a selected part of it. On the Yaxis the number of fish in each size group is shown per day, and the date is on the X-axis. Press the "Filter" button to

Filter Settings	-	X
Time period From: Set 8.10.2009 ▼ Time To: Set 7.11.2009 ▼ Time Show All	Categories ✓ Generic ✓ Not fish ✓ slim	Visible size groups ✓ Small ✓ Medium ✓ Big Direction ← Up ← Down ← Up · Down ✓ OK

examine all categories together or one at a time, and you can set the boundaries for the category sizes (see chapter 3.6 Settings).Use the Year, Month, Day and Hour buttons to examine particular periods in greater detail.



The "Operating Status" (green bar on the X-axis) shows how the system has been performing over the period. If the light diodes have been blinded for more than 20minutes of the last 60 minutes, then the green bar turns to red for that day. It also happens if the power of the deep cycle battery has gone under 11.2 Volts.

# 3.8.2. Time Chart

This chart shows the migration pattern of the fish over the period related with the length of the fish. The length of the fish is shown on the Y-axis and time on the X-axis. Positive lengths denote ascending fish and negative lengths descending fish.

Each column represents one fish; click on a column for the image of each fish and information about the length, the registration time, size category, depth in scanner and swimming direction.

The fish may be divided into three size categories as specified by the user (under "Settings"). Specific periods may be selected by clicking the buttons for Year, Month, Day and Hour.

To enlarge individual parts of the display, hold the left mouse button down and drag the mouse pointer downwards and to the right. To restore the full display, hold the left mouse button down and drag the mouse pointer upwards and to the left.

To examine earlier or later periods, hold the right mouse button down and drag the mouse pointer to the left or right.

The size categories can be changed easily by altering the specified length boundaries. Also, you can specify the categories to be examined by clicking the "Visible size groups" field in "Settings".

Under "Direction" you can choose whether you examine fish that climbed or descended the ladder, or both together, which is the most common setting.



# **3.8.3. Migration Chart**

This shows the time of the day when the fish were recorded. As with the previous charts, you can examine a particular period or size category in greater detail and choose between fish passing up or down the ladder or examine both groups together.



# 3.8.4. Length Chart

This shows the breakdown of the fish by size category. In addition to examining one or more size categories in greater detail, and using the Year, Month, Day and Hour buttons to select periods, you can also alter the units on the X axis and set them from 1 to 10 cm according to the category you wish to examine (under Settings).



# 3.8.5. Year Comparison Chart

This chart shows the comparison of the migration pattern between years, just add files to the database for the wanted periods.



# 3 Underwater camera connection (optional)

An option to the Riverwatcher is to connect an underwater camera to the system. Then the scanner is used as a trigger for the camera that takes up to five pictures of the fish. Then the photos are linked to the silhouette image drawn by the infra-red scanner, so it becomes possible to identify species, sex and other information of value to the user. This is only possible with a special PC version where a computer with a special program replaces the yellow control unit. The advantage of this method is that the user, who examines the data, can quickly go through the photos and analyse them on the computer. Information is automatically stored in a database file among other data on time of passage, size, temperature and a silhouette image of the fish from the infrared scanner. Graphs of the migration pattern can be viewed immediately. For instance: as total number of fish by species, or gender. The size distribution of each fish species can be viewed and water temperature changes over the season. Having all the information stored in one database with digital images, greatly reduces the work required to analyse date on fish abundance and gives more reliable information behaviour pattern of fish in a complex river ecosystems.

2000 05:07:00	Add/Renave Files	Convect 1		w Est				
ia Ula 10	Depth joint Lev 133 20 30	ata kanel: Position 79 73 40 50	Speed(w/s) 0.32 60 7	) a)	90	100	4	Inspe T
		-		_				Children Martin
			~					Statement of the local division of the local
-								Concession of the local division of the loca
							And Income	No. of Concession, name
ř							- x -	Statistics in success
ml v	-					-		and the second s
damid	Siltouette 1						Clinical Bar	and the second second
Chefz								-
and a second second		2 1 1						
CPUCKED AND AND AND AND AND AND AND AND AND AN	e   File resords   Visibilita			10.000			the second se	and the second
eloget.	Oate/Teec		gth love Category		peed [m/s] Fia			- Aller
	▶ 5.4.2003 05:07:00	133	79 Genetic	Up	0.32	11		
	5.4.2003/05/07:00	125	75 Geretic	Up	0,96	23		
Gerweic	54,2003,0507.00	146	87 Garanic	Up	0.37	15		
	5.4.2003 05:07:00 5.4.2003 05:07:00	112	67 Genetic 63 Genetic	Up	0,44	22		
	5420030507:00	115	63 Genetic	Down	0,25	10		
	5.4.2003 05:08:00	115	63 Genetic	Up	0.44	25		
	5.4.2002 05:02:00	110	GG Genesic	Up	0,54	19		
lot fich	5.4.2003 05:08:00	123	73 Geresic	Ua	0.38	B		
	54,2003 05 08 00	129	77 Genetic	Down	0.23	B		
	5 4 2002 05 02 00	125	75 Genesic	Down	0,2	12	21	
	5.4.2003 05:09:00	146	87 Generation	Up	0,45	16		
	5.4.2003 05:09.00	115	69 Genetic	Up .	0.34	22		
	5 4.2003 05/09/00	110	66 Genetic	Up	0.44	21		
	54.2003 05 09 00	122	73 Gerweic	Up	0,34	21		
	5.4.2003.05.09.00	124	74 Generic	Up	0.45	24		
	5.4.2003/0510:00	710	66 Generic	Down	0,1	13		
	5.4.2003 05:10:00	117	70 Generic	Down	0,17	9	11 I I I I I I I I I I I I I I I I I I	
		127	76 Geneec	Doveri	0.12	14		
	5 4 2003 05 10 00			Up	0.39	13		
	5.4.2003.05.10.00	116	69 Genetic					
			69 Genetic 69 Genetic	Up	0,42	17		

The setup of the camera is critical, and there are several factors that can affect the quality

and resolution of the pictures.

#### 1. The placement of the camera

To obtain the best pictures the distance from each fish to the camera must be the same all the time. But the placement of the camera and the camera angle can be different from fish way to fish way because of different swimming speed and behaviour of the fish. The before it can be necessary to make some changes after the first installation and after viewing the pictures.

#### 2. Intervals between pictures and number of pictures

It is possible to set the interval between the pictures and also the number of pictures taken. If the fish swims with high speed through the scanner frame and by the camera the intervals must be short, but if the fish even stops in front of the camera then the intervals should be longer. This is something that has to be set specially for each installation.

#### 3. Light conditions

The camera that is used to take pictures uses infra-red light when the light condition gets poorer. To get optimal resolution it might give better results to install an extra infra-red light or a regular light with the camera, especially if the fish is migrating during the night and late in summer/autumn. This is different between installations.

# 4 Error sources

There are different errors that can occur while using the program.

## 4.1 Error in line

Sometimes it can happen that an error occurs in some of the lines in the ARV file. This is usually caused by bad connection over modem. Below is an example of ARV file with two error lines (file A). This error is easy to fix, all the columns have to be linear so in File B both the lines have been fixed. If there are some data missing from a line, then the date put in the new line must be in accordance with the date and time in the lines before and after.

The meaning of the columns in the file are **A**:Fish height **mm**, **B**:Scanned length **cm**, **C**: Position in frame, **D**:Month, **E**:Day, **F**:Hour, **G**:Minute, **H**:+/- up or down, **I**:Code

[river] North la [date]			Name of counter Date of download									
21/08/2003 [time] 12:39:00			Time of Download									
[Endad 37854.	atetime] 6805556 latetime] 5270833 values]		Coded reset time & date Coded download time & date									
Sal.up : Tr. up : Sal.dwr Tr. dow [comme	51 n :6 m :8	}		Fish nu	mbers	counted in this file						
[visabili North la [temper	adder_20 ty file] adder_20 rature file	0030821. 0030821. 2] 0030821.	vsb			elated image, temperature atus files						
0	3	7	30	16	20	Date & time of last counter reset						

File A										
Α	В	С	D	Е	F	G	н	I		
102	53	44	6	29	7	55	+	16		
110	43	47	6	29	8	0	+	16		
90	51	16	6	29	9	47	+	16		
127	57	59	6							
95	52	72	6	29	10	10	+	16		
96	71	69	6	29	10	14	-	0		
102	52	47	6	29	10	25	+	16		
	_									
File E	3									
102	53	44	6	29	7	55	+	16		
110	43	47	6	29	8	0	+	16		
90	51	16	6	29	9	47	+	16		
127	57	59	6	29	10	2	+	16		
95	52	72	6	29	10	10	+	16		
96	71	69	6	29	10	14	-	0		
102	52	47	6	29	10	25	+	16		

NB! The ARV files are the raw-data from the counter. If they are to be changed or altered, then make a copy of the original one, and make changes to the copy.