Bioscanner

User Manual

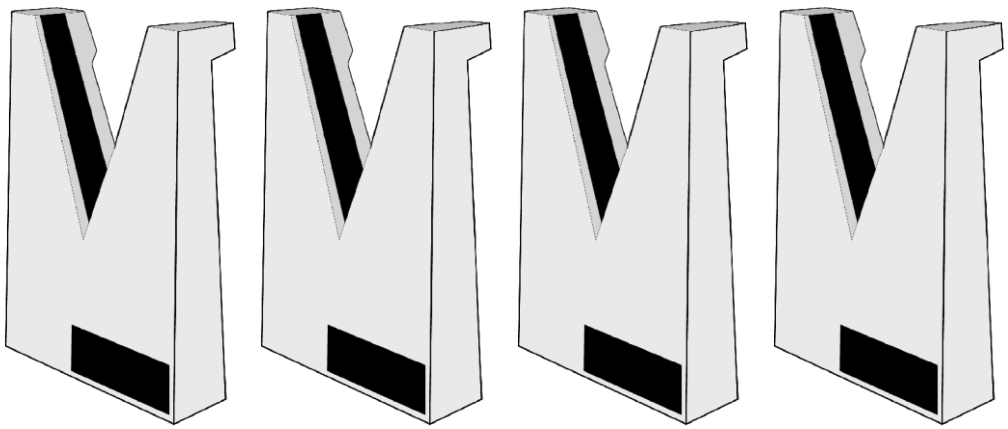


TABLE OF CONTENTS

VAKI
Akralind 4, 201 Kópavogur
Iceland

Tel. 354 - 595 3000
Fax. 354 - 595 3001
e-mail: vaki@vaki.is
www.vaki.is

WARRANTY TERMS

VAKI Aquaculture Systems Ltd. offers warranty for defects that appear within two (2) years from the date of delivery by VAKI Iceland, on condition that the equipment has been assembled, used, and maintained in accordance with the instructions for assembly and use.

VAKI undertakes to repair all defects that are due to faults in the design, materials used, or manufacture of the equipment. These defects will be rectified by repairing the equipment, or replacing components. The complete unit or parts thereof may be required to return to the factory in Iceland for repair.

VAKI accepts corresponding warranty for original parts fitted by VAKI as replacements, for a period of one (1) year from the date supplied.

VAKI will ***not*** be liable for:

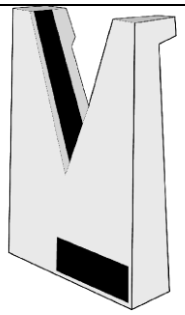
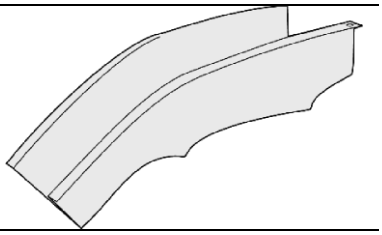
Incorrect assembly and use, or inadequate maintenance.
Defects which result from the fitting of materials, components, or devices not supplied by VAKI, and which are purchased and fitted by the user.
Defects due to changes made to the equipment by the user, without the written consent of VAKI.
Faulty or inadequate repairs carried out by the user.
Normal wear and tear of the equipment.
Faulty connection of electrical equipment.
Faults caused by excessive voltage.
Damage or stoppage due to immersion of the computer or camera in water.
Damage to electrical supply cables.
Any economic loss that may arise from production stoppage.

If faults or defects appear in the equipment, the user must report this in writing to VAKI or its appointed representative as soon as possible, and without unjustifiable delay. The report must be sent within two (2) weeks from the expiry of the deadline, which is two (2) year from the date of supply by VAKI Iceland.

<u>If the purchaser does not inform VAKI or its representative within the time limits stated above, the purchaser shall forfeit the rights of the warranty.</u>

LIST OF ITEMS

The main parts of the Bioscanner are:

1)	The scanner	
2)	Cable	
3)	Control unit – single channel or multi – channel.	
4)	V-channel	

1. PREFACE

VAKI Aquaculture Systems Ltd thanks you for choosing the Bioscanner. More and more aquaculture enterprises are using equipment from VAKI in their day-to-day production and management. An accurate knowledge of the number of fish, and the average weight and size distribution in each pen is the basis for success in today's tough competition.

The Bioscanner is a sophisticated electronic device specially designed for counting both small and large fish on fish farms. Among the clear benefits of using the Bioscanner are:

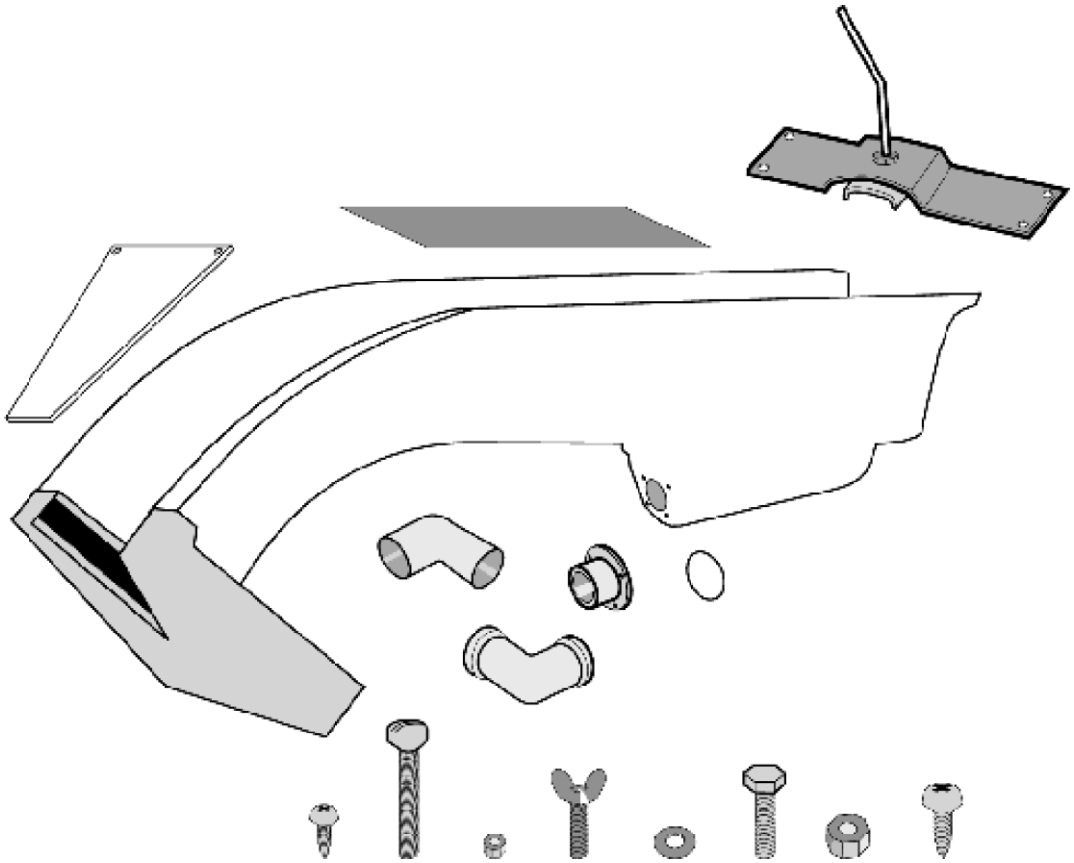
- Manpower saving
- Increased efficiency
- Accurate data on number of fish in each size category
- Efficient feeding and accurate medical dosage
- A safer basis for insurance assessment

The Bioscanner is very gentle and the fish is not touched by any mechanic parts when counted, and the fish are in water at all time. Correct set up and use of the Bioscanner fish counter is essential for accurate results. Please read this manual carefully.

This manual is a guide to assembling the V-Channels and the use of the Bioscanner control unit.

2. ASSEMBLY INSTRUCTIONS

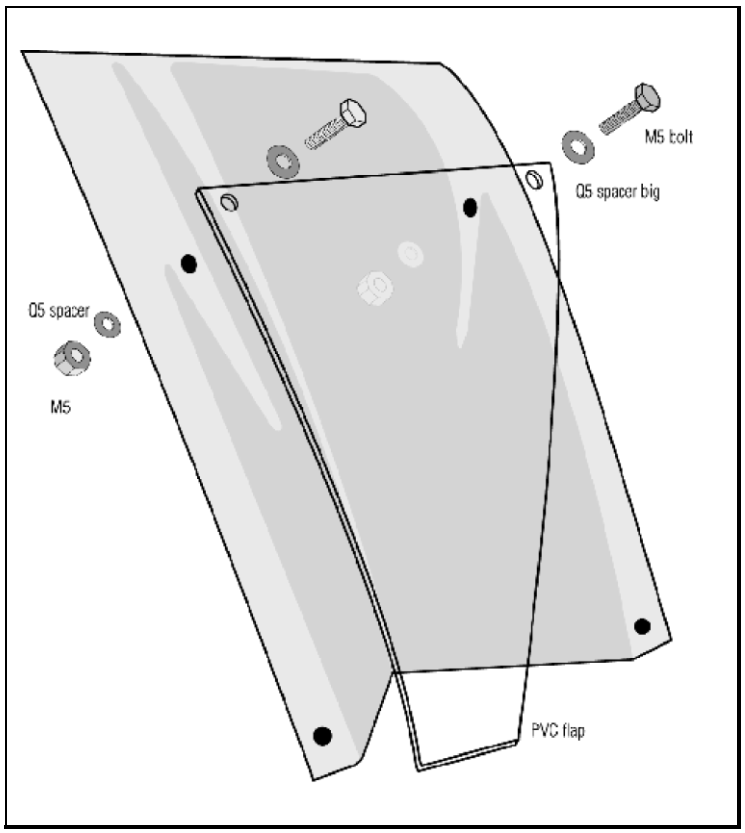
The Bioscanner V-channel is manufactured and packed ready for assembly by the user. ***V-CHANNEL 1*** is recommended for fish from 3 gr. - 750 gr. and ***V-CHANNEL 3*** is recommended for fish from 500 gr. - 6.000 gr. Following are the parts for ***V-CHANNEL 1***.



2.1 V-CHANNEL 1

1. Glass-fibre reinforced polyester channel
2. Polyurethane flange
3. Rubber 0-ring
4. Two 90° PVC elbow joints
5. Aluminium grating
6. Transparent PVC flap
7. Stainless steel screws, bolts and nuts
8. Clamp

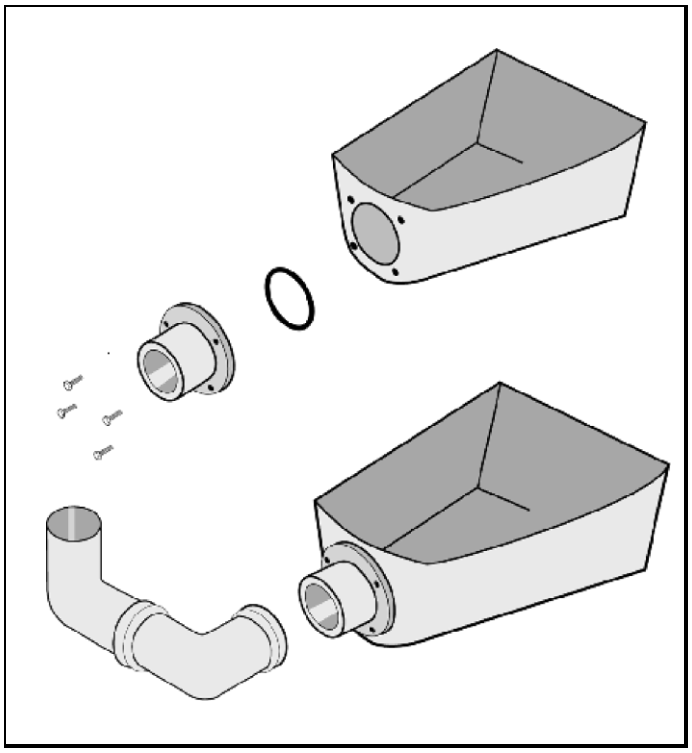
2.1.1 Attaching the PVC flap



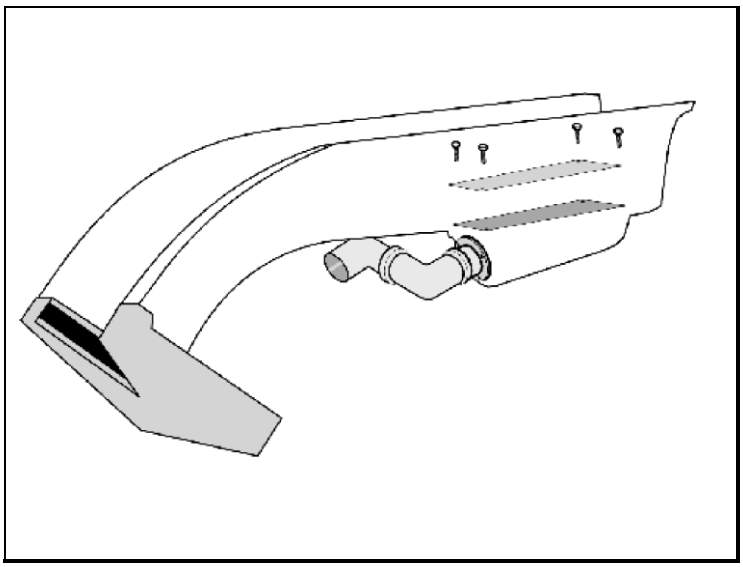
Parts: 2 x M5 bolts, 2 x M5 nuts, 4 x Ø5 washers. Place the flap in position at the end of the channel. Fasten the flap in position with the M5 bolts. Check that the flap is hanging straight. Adjust if necessary.

2.1.2 Attaching the flange and the 90° elbow joints

Prepare all the parts needed: The channel, the flange, the 0-ring, 4 M5 bolts and nuts and the two elbow joints. Place the 0-ring in the recess in the flange and fasten the flange to the channel with the four bolts and nuts shown, tighten the nuts evenly. Before fitting the 90° elbow joints to the flange, lubricate them with soap and/or water.



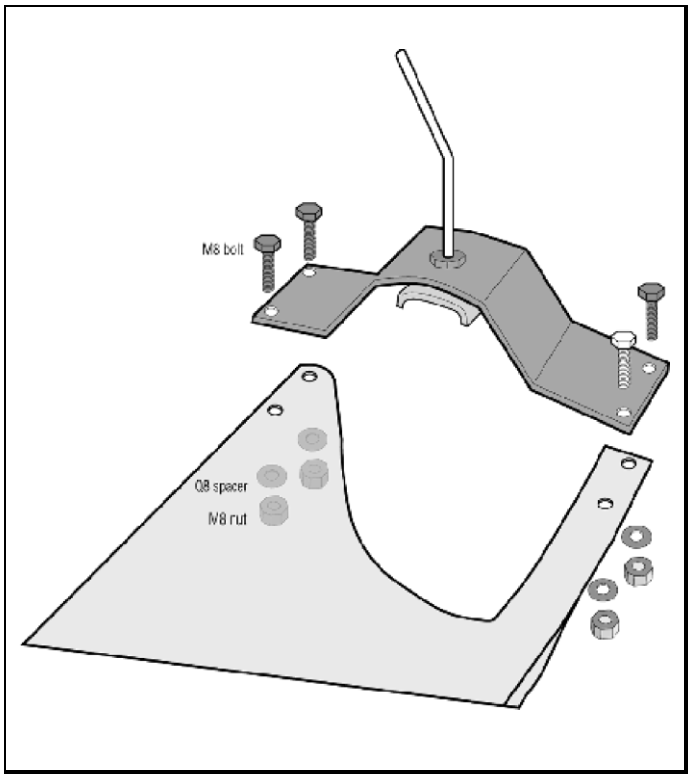
2.1.3 Fitting the aluminium grating



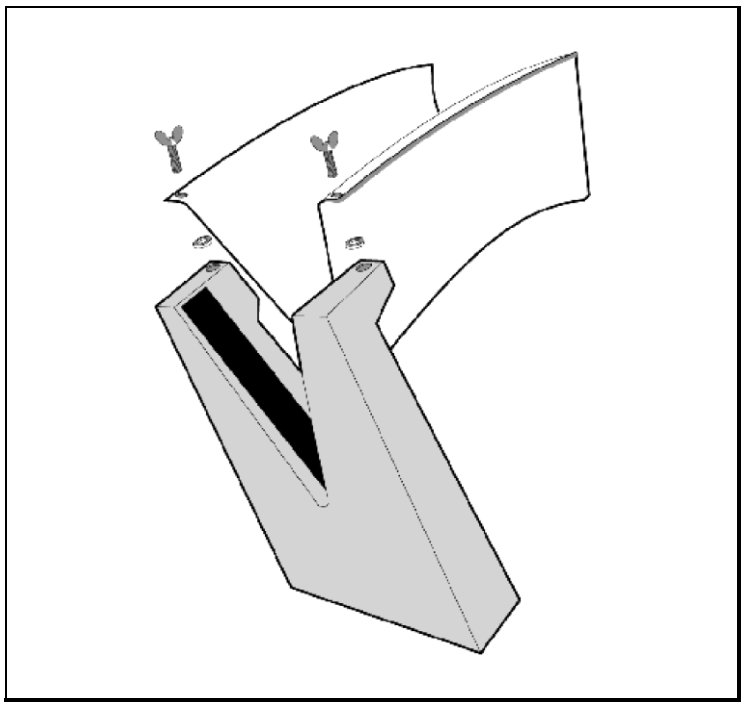
Tools required: Silicone gun. Prepare the grating and four M3 screws, spacers and nuts. Make sure that the smooth side of the grating faces upwards so as to avoid injuring the fish. The smooth side can be identified by running your fingers across the grating.

2.1.4 Fitting the clamp

Prepare all the parts needed: 4 M8 bolts, 4 washers and 4 M8 nuts. Place the clamp in the inlet of the channel, aligning the holes on the clamp. Place all 8 mm screws in position before tightening fully. To prevent all bolts from corroding, some grease has been put on the bolts and bushings.



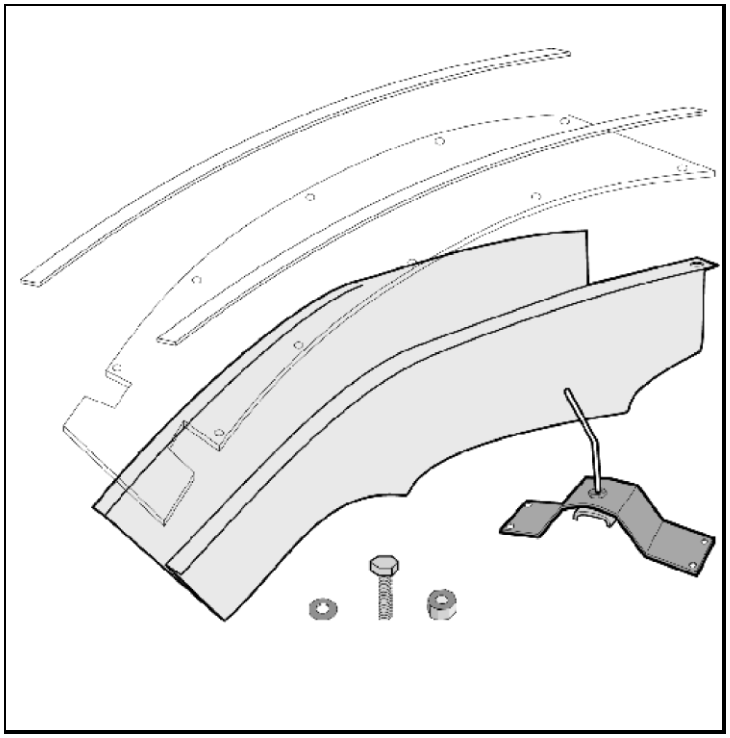
2.1.5 Installing the scanner unit



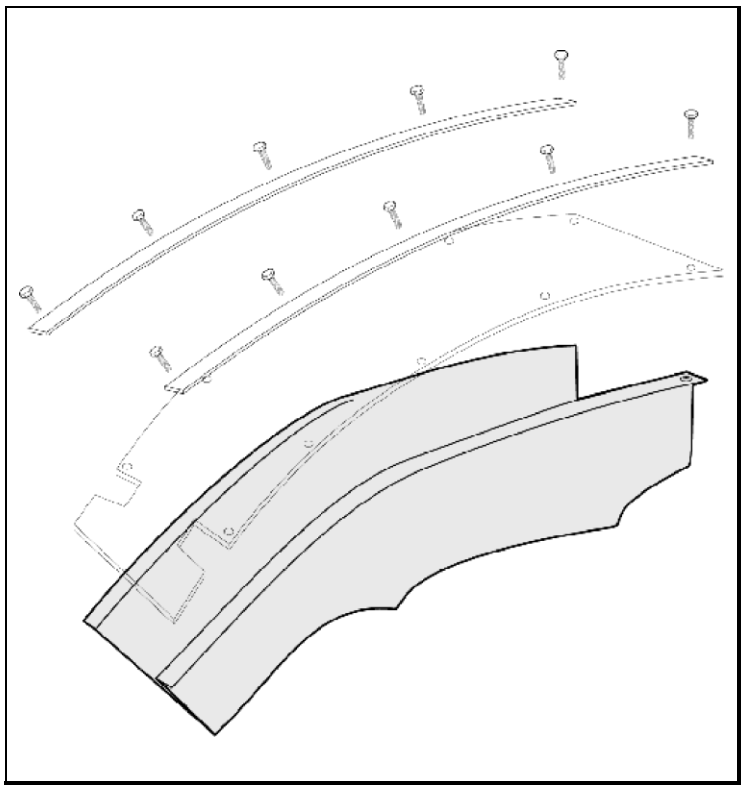
Place a washer on each of the two wing screws. Put the screws through the pre-drilled holes in the channel and secure them with the plastic locking washers. Place the scanner unit in position and secure it by tightening the wing screws.

2.2 V-CHANNEL 3

1. Glass-reinforced polyester channel
2. Plastic cover with two plastic strips
3. Clamp (with bolts and screws)
4. PVC flap
5. Stainless steel screws, bolts and nuts



2.2.1 Attaching the PVC plastic cover



Prepare 10 M5 bolts and nuts, two strips, the plastic cover on top of the channel, aligning the holes in the cover and the channel, then place the strips on the top of the cover aligning the holes and put all the M5 bolts in before tightening fully with the M5 nuts on the other side.

2.2.2 Fitting the clamp

See chapter 2.1.4 Fitting the clamp.

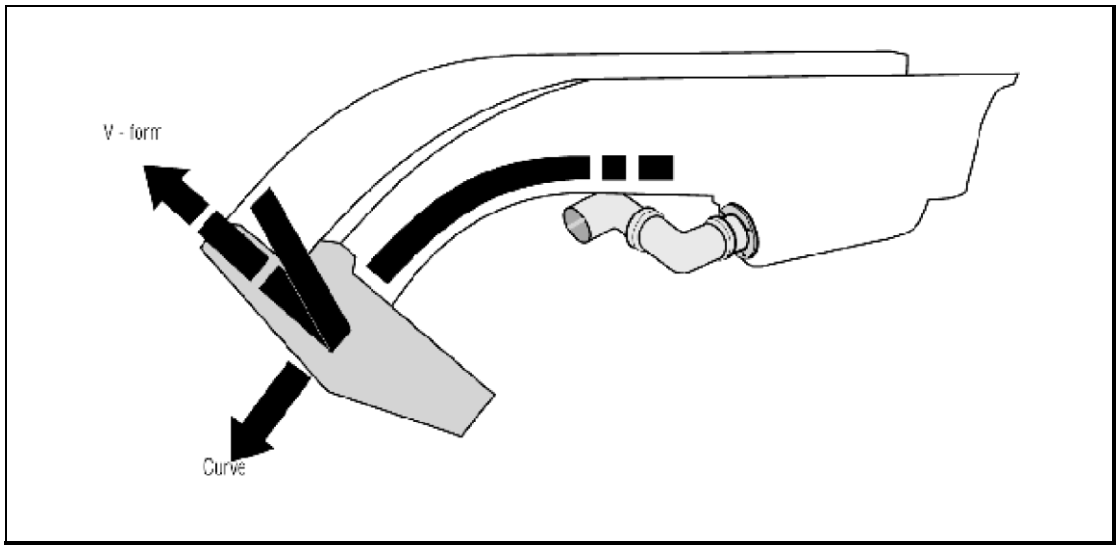
2.2.3 Installing the scanner unit

See chapter 2.1.5 Installing the scanner unit.

3. OPERATION

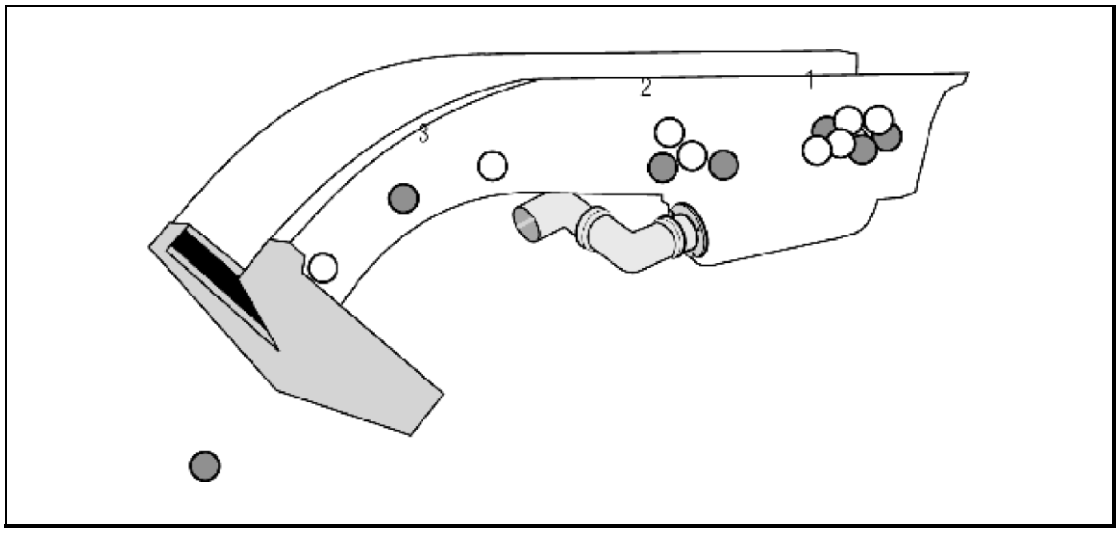
3.1 THE PRINCIPLE FUNCTIONS OF THE BIOSCANNER CHANNELS

The V-channels of the Bioscanner are specially formed to separate the fish as they glide through.



The two main functions are the V-form and the curve form. As the fish come out of the basin they are close together, and have to be separated to be counted accurately. The V-form ensures that the fish cannot turn around, and also that they are not crowded together.

The curved form accelerates the fish down the channel. If two fish are close together in the beginning the one that is little bit ahead will accelerate faster and this causes a separation of the fish. See figure 2.

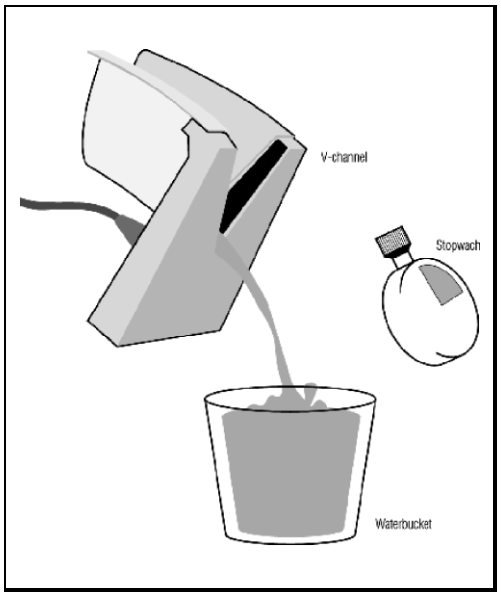


3.2 CONTROLLING THE WATER-FLOW

For correct operation the amount of water must be adjusted to the size of the fish. Generally speaking, better separation of the fish will be achieved if not too much water is used. On the other hand sufficient water must be used to flush the fish smoothly down the channel. The following table can be used as a rough guideline. The figures are for salmon, other fish species (different shape) may require slightly different amounts of water.

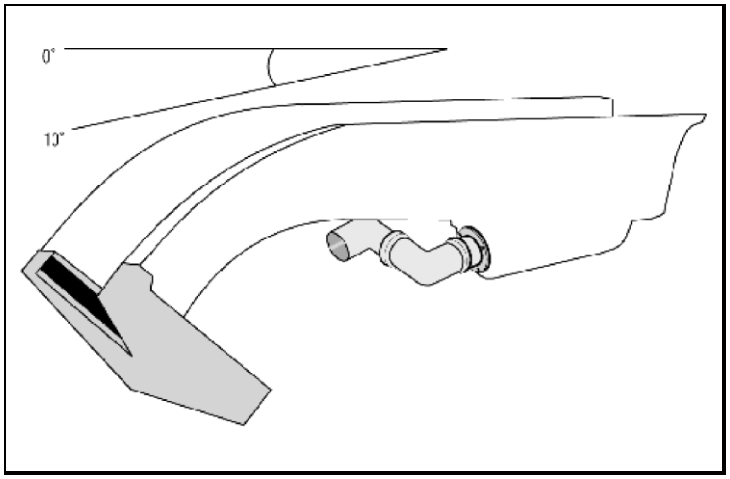
The figures shows how correct water flow can be achieved by using a stop watch and a water bucket (12 – 14 litres). The time is measured while the water flows from the channel and fills the bucket.

Fish size	**Flow per channel**
Up to 10 gr.	3 - 6 l. /min.
10 - 30 gr.	6 - 10 l. /min.
30 - 150 gr.	10 - 60 l. /min.
150 - 1500 gr.	60 - 130 l. /min.
1500 - 6000 gr.	130 - 210 l. /min.



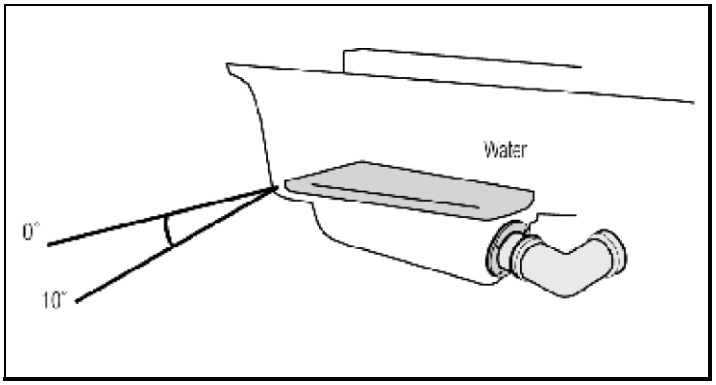
3.3 SLOPE OF THE CHANNEL

Generally, the slope of the V-channel should be about 0° - 5° for stable operation. For higher capacity (and lower accuracy) the slope can be increased to 10° - 15°.



3.4 LEVEL OF THE CHANNEL

By pouring some water into the bottom of the V-channel, it is possible to use the channel itself as a level indicator.



3.5 COUNTING

The Bioscanner is now ready for counting. It displays the number it had before the power was cut the last time. Double clicking on the count textbox for each Bioscanner will reset the count for that Bioscanner to zero. Pressing the **Start** button will start counting from zero for all Bioscanners and will generate a pdf report after clicking the **Stop** button.

3.6 POWER FAILURE!

In the event of accidental power failure the counter will stop counting but the control unit will remember the counting figures from when the power failed. Clicking the Start button will reset the counters back to zero so be sure to take note of the numbers if you want to keep them.

3.7 END OF OPERATION

When the counting operation is completed, disconnect the leads and store the equipment in a dry place. Screw caps on connections and plug cables end to end. Clean and dry the scanners with a soft cloth.

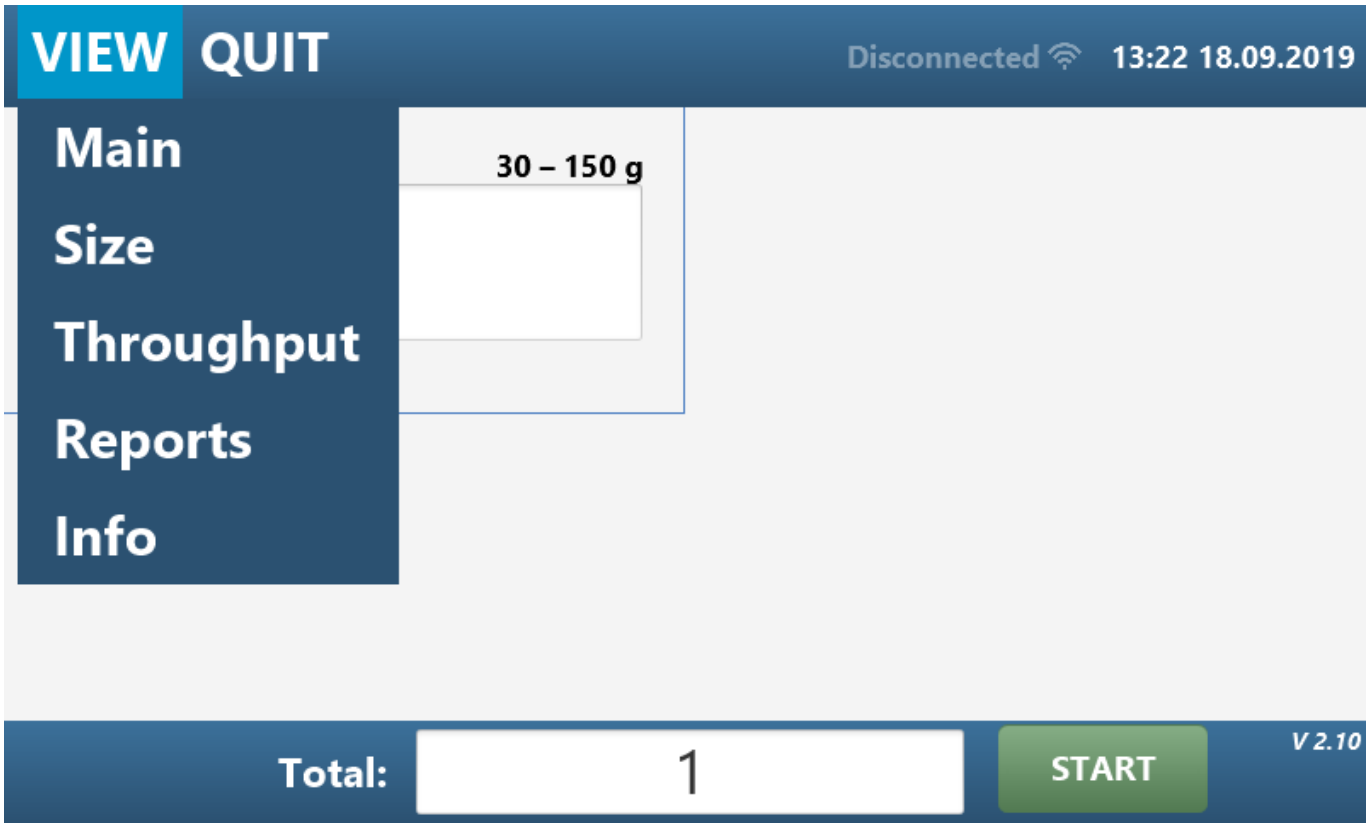
NEVER CLEAN THE WINDOWS WITH ACETONE, AS IT WILL RUIN THEM COMPLETELY.

4. CONTROL UNIT APPLICATION

The control unit is used to set up the counter according to the fish size and the way the counter is to be used. In the application, you can view the last hour throughput and generate reports to validate the count. The application stores all data so the user can validate the data for reassurance purposes.

4.1. OVERVIEW

By pressing VIEW you can select the view you want to have on the screen. The views are as follows.



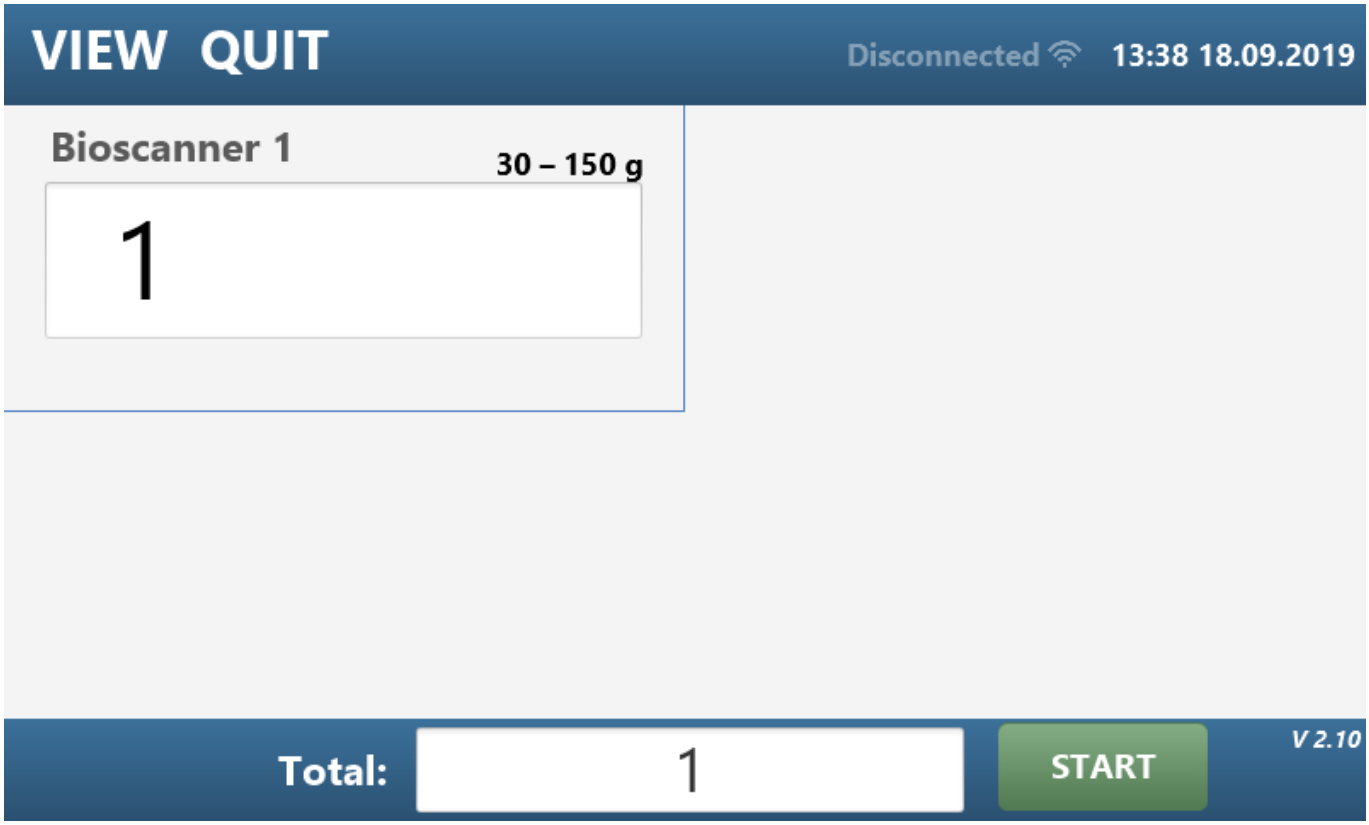
1) **Main** shows the count in each channel.
2) **Size** allows you to set the size group for the counter.
   The size groups are: < 10 g, 10 – 30g, 30 – 150g, 150 – 1500g, >1.5 kg.
3) **Throughput** shows the throughput for the last hour.
4) **Reports** allows you to set counting session's information and view and copy counting reports.
5) **Info** shows software versions and similar information

At the bottom of all screens is the total count and a start button. To start a new counting session press the "**Start**" button. Once activated this button will change to **Stop.** To stop the counting session press "**Stop**". When the counting session ends all the reports and records will be generated and ready to be uploaded to VAKI cloud.

4.2. MAIN VIEW

Up to four counters can be connected at the same time. The main view shows the count for each counter. By double pressing the count you can reset the count without stopping the counting session. The total count is not affected by the reset**.**

If the counter is unplugged, the count number will disappear, demonstrating that the counter is not connected. If you reconnect the counter it will appear again, with the same count as it had before it was disconnected. There is no need to stop the program and restart it, the program always knows if a counter is connected or not.

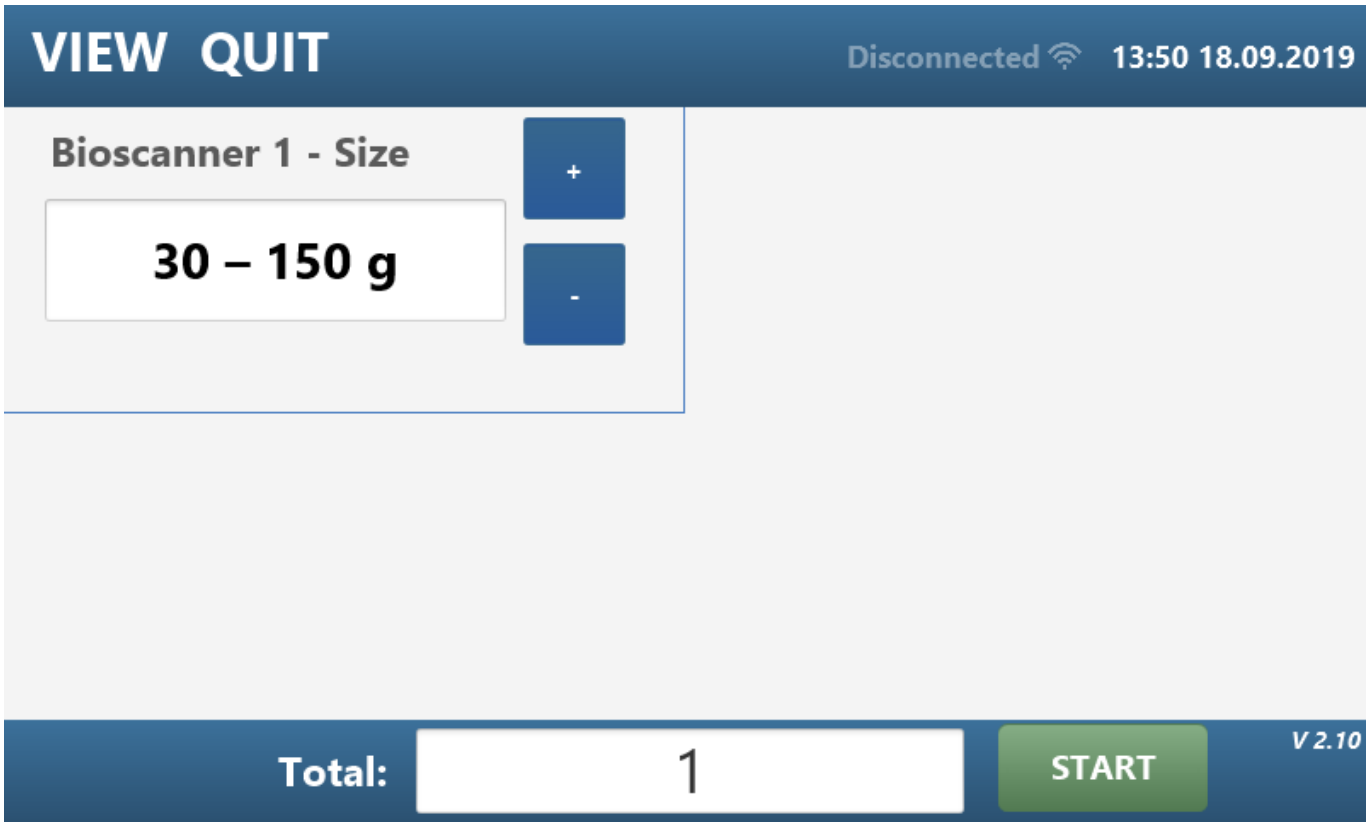


4.3. SIZE VIEW

Here you can set the size group for each counter. The size groups are:

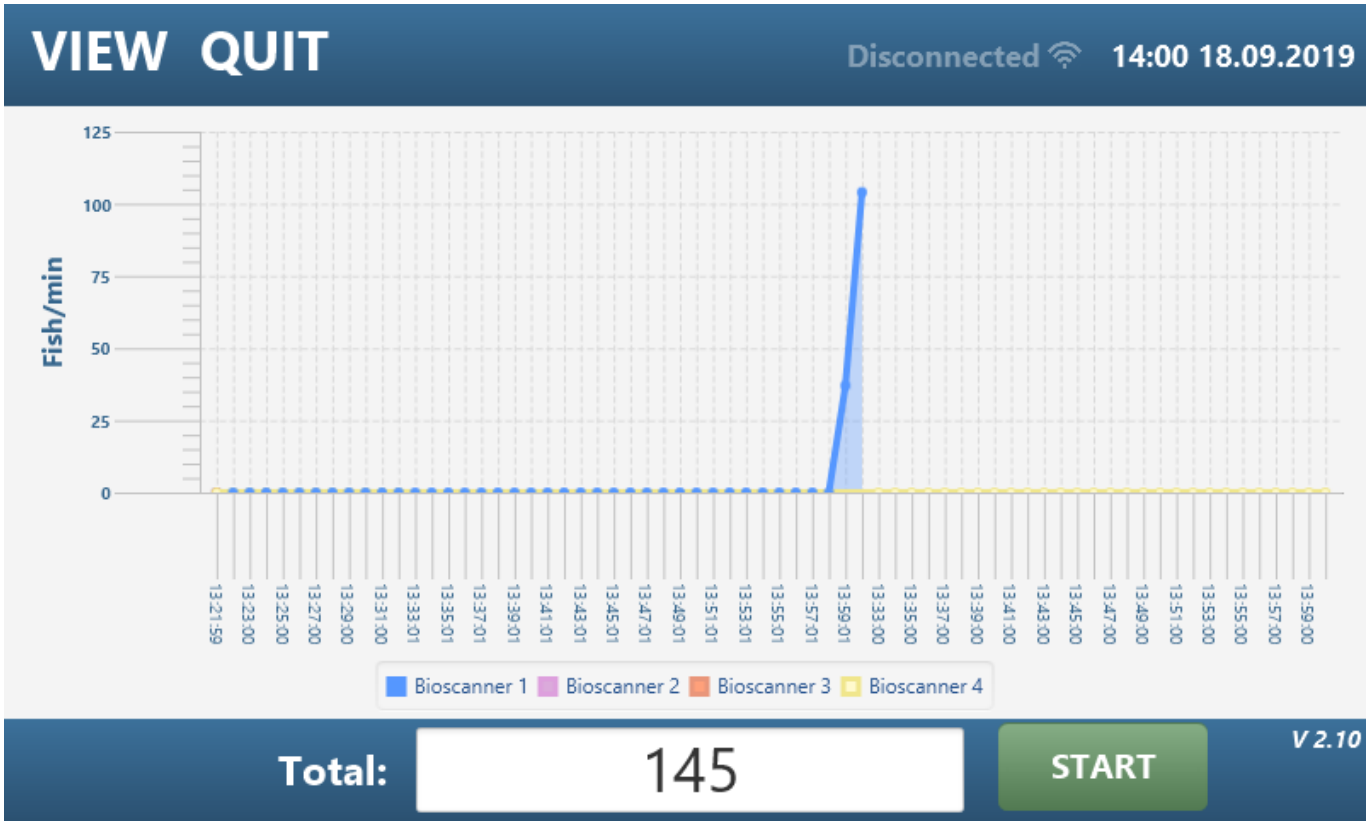
- **< 10 g**
- **10 – 30 g**
- **30 – 150 g**
- **150 – 1500 g**
- **> 1.5 kg**

Make sure to select a size group that suites best the fish that is being counted. **Also make sure to unplug and reconnect the counter after setting the correct size** to ensure the scanner is using the correct size group.



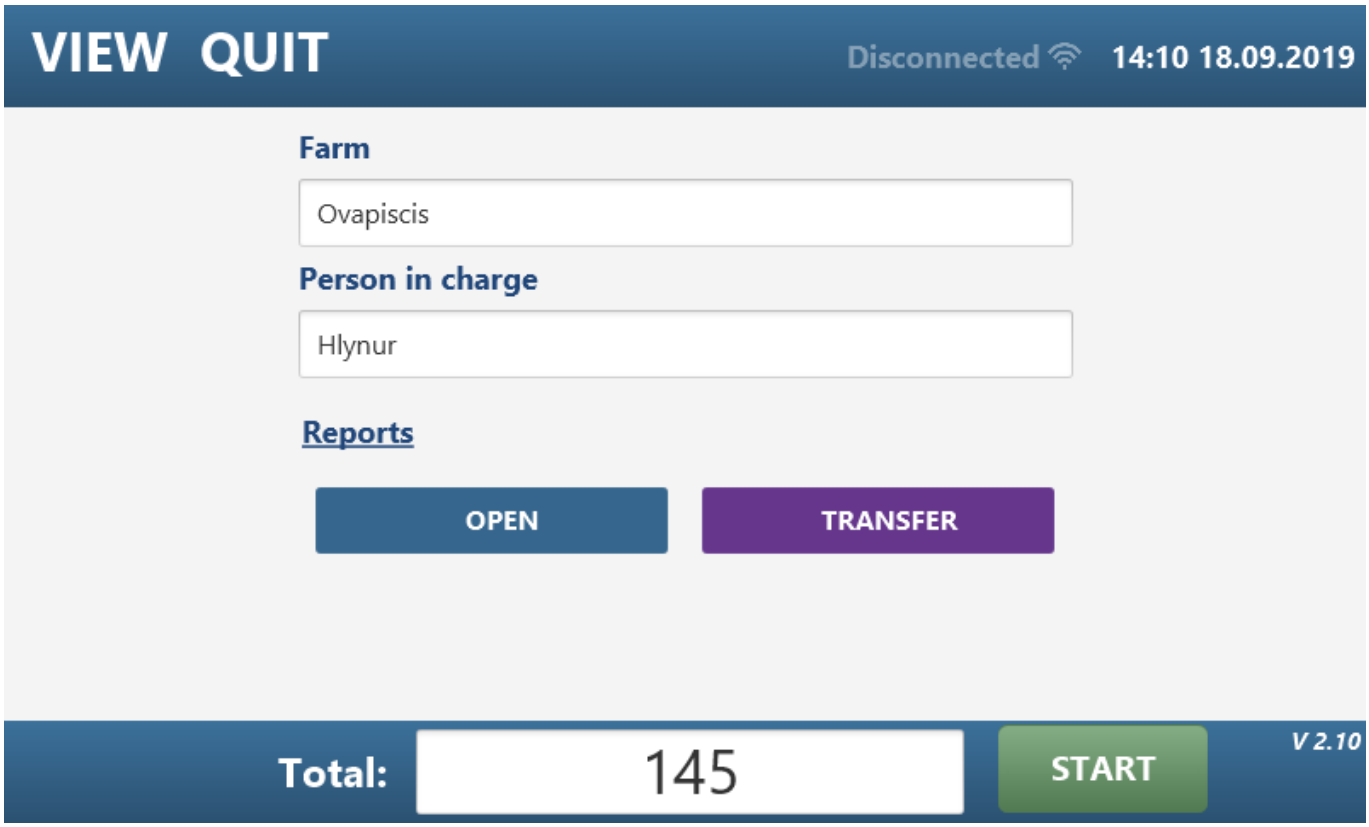
4.4. THROUGHPUT

The Throughput view shows a graph of rate of fish passing through the counter the last hour. The graph updates every 15 seconds and each point in the graph shows the throughput since last update. This graph is displayed in the counting report that is generated after each counting session.



4.5. Report View

The report view allows you to set the farm name and the name of the person in charge of counting. Here are also OPEN and TRANSFER buttons to work with the generated reports from counting sessions. Clicking the OPEN button brings up a dialog box where you can select which report you want to open. Clicking the TRANSFER button brings up two dialog boxes, in the former one you select which reports to copy and in the latter one you select the destination the reports are copied to.



On the following page is an example report.

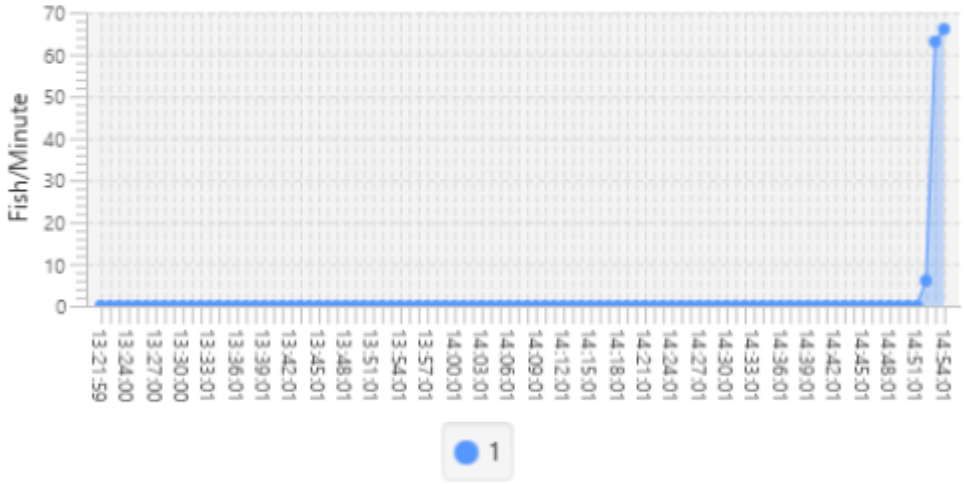
Bioscanner Counting Report

Farm	**Ovapiscis**
Counted by:	**Hlynur**

Bioscanner Name:	**1001**	**Date:**	**Wed Sep 18 14:51:53 GMT 2019**
		Total Count:	**172**
Scanners:	**1**	**Counting Time:**	**00h:03m**

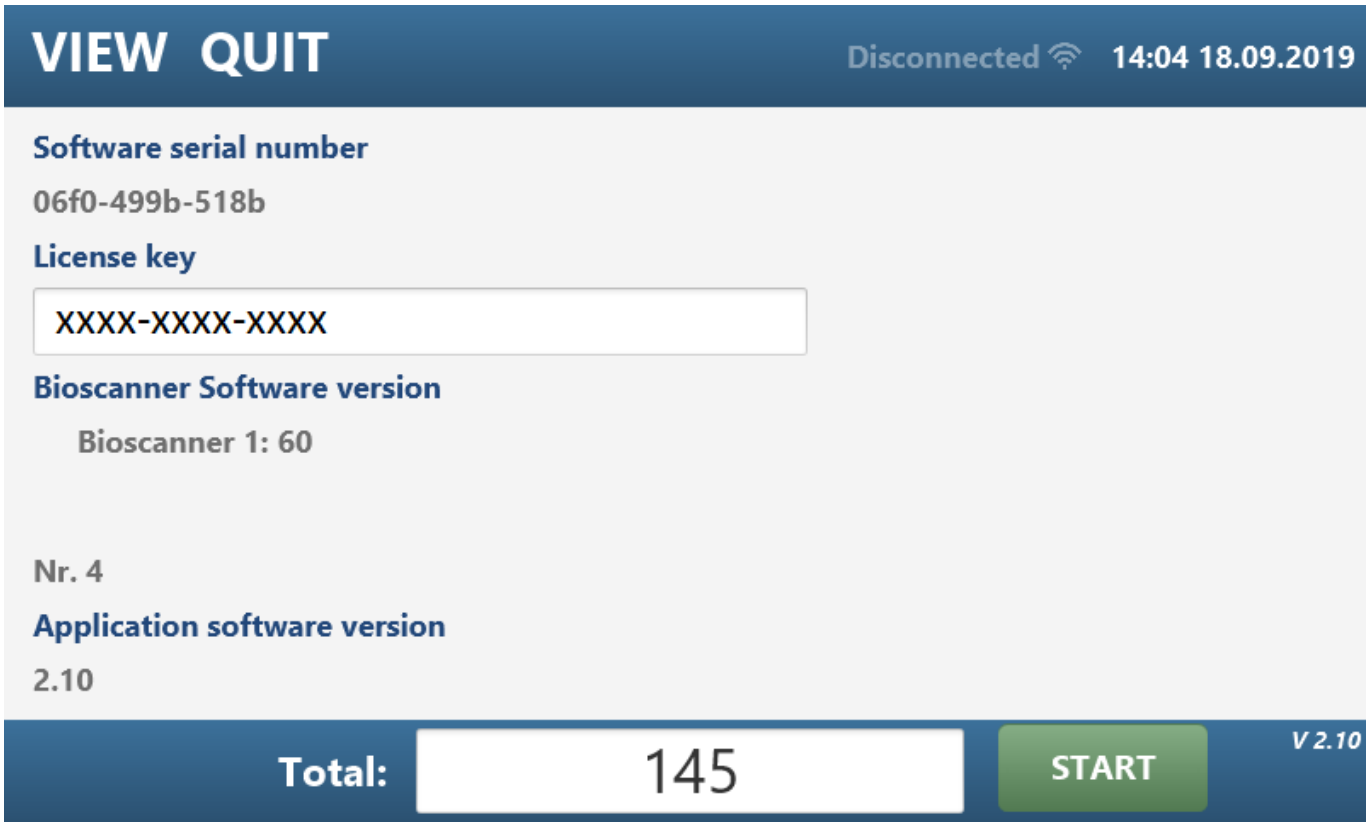
Scanner Name	Weight sensitivity	Avg per/min	Total Count
Bioscanner 1	30 – 150 g	57	172

Bioscanner Fish/minute



4.6. INFO VIEW

Here you can view the various software versions, serial number and the license key.



5. TROUBLESHOOTING

5.1. OVER COUNTING

If the water flow in the pipeline is uneven and the water is splashing inside the scanner, try to reduce the water or adjust the water flow. Check and ensure that the fish not going backwards through the counter again. Check if the fish size is correctly set on the Control Unit.

5.2. UNDERCOUNTING

Check if the fish size is correctly set on the Control Unit. When too many fish are pumped through the Scanner Unit, the counter is not able to count all the fish because the images are overlaying each other. Check the rate of fish to ensure the counter is not overloaded. Try to reduce the amount of fish, and make sure the fish are not blocking up in the pipeline but gliding smoothly through the pipe. If there is not enough water for the fish to slide smoothly down the pipe, this can also cause a blockage.

6. TECHNICAL SPECIFICATIONS

Control Unit:	**Single Channel**	**Multi Channel**
Dimensions:	240 x 160 x 70 mm	300 x 180 x 70 mm
Weight:	2.0 kg	3 kg
Power:	12 V DC or 110/220V AC with adaptor	

Scanner Unit

Dimensions: 25x20x35 cm
Weight: 3.0 kg

V - Channel 1

Dimensions: 150x40x32 cm
Weight: 7.0 kg
Fish size: 3 gram - 750 gram

V - Channel 3

Dimensions: 100x32x28 cm
Weight: 5.0 kg
Fish size: 500 gram - 6 kg

Alarm (Optional)

Leads / cables

Connector lead: 15 meter
Control unit to power point: 2 meter
Other lengths available on order

Rating

Supply: 220 V (110) AC 48 – 68 Hz
12 V DC optional
Max. power consumption: 12 W

Water protection

Control Unit - IP 65
Scanner Unit - IP 67

Operating environment:

Air temperature: 0° - 40° C
Sea temperature: 2° - 30° C

Capacity

Fish per scanner unit per hour (continual flow of fish and with more than 98% counting accuracy)

7. AVOIDING PROBLEMS WITH CONNECTORS

Cleaning the connectors on scanners, cables and on the control unit after use with electronic cleaning solvent spray will prolong live and assure proper functioning of your equipment for a long time.

Another step is vital when using the Bioscanner:

- Keep the cables connected to the scanner at all time when working in salt water

The following maintenance procedure is recommended for all connectors on cables and equipment from Vaki.

- **Clean all connectors** after use with Electronic Cleaning Solvent Spray. (Ask your local electrician where you can buy cleaning solvent, type Electrolube or equal)
- **Inspect cables** for damage and make them up for storing. Check the O-ring rubber sealing in the female type connectors.
- Store equipment in a **dry place** when not in use.
- **Connect all cables** to scanners pre entering the site
- **Avoid disconnecting** the scanners at sea site
- Take precaution steps when installing at site. Keep cables **free of walkways** and other places where cable can accidentally be frayed or cut.

APPENDIX

THROUGHPUT CHART