USER MANUAL

AKVAconnect 4.1

Technology for sustainable biology
Thank you for choosing AKVA group

AKVA group develops, manufactures and supplies technology and services aimed at solving biological and technical challenges in the global aquaculture industry. All our products, from single components to service assignments and complete farms, are designed to achieve the best possible fish welfare, operational performance and profitability for our customers.

We aim to write easy to understand user manuals, while providing as accurate and updated information as possible. In order to do this, we rely on input, feedback and collaboration with people who use our products. We appreciate all the input we have received, as this helps us provide better and safer equipment and solutions. Please contact us through our websites with questions or suggestions for improvements.

This manual is written in correlation with the requirements in the standard “NEK EN 82079-1.”

Unless such responsibility has been agreed upon in a separate written contract with AKVA group, we are not responsible for loss, damage or incorrect use of equipment or software that arises as a result of errors in text or illustrations, or by following instructions in this user manuals.

For a thorough introduction to your AKVA group product, carefully read through this user manual before assembling, installing or using the product. Most of our user manuals are available from our website: www.akvagroup.com/products/user-manuals.

Together we can contribute to making sure that fish farming is an environmentally friendly, sustainable and growing industry that produces safe and healthy seafood for a global market.

Best regards,
AKVA group
# TABLE OF CONTENTS

1 SAFETY ................................................................. 4
   1.1 Safety symbols ...................................................... 4
   1.2 Personnel safety .................................................... 5
   1.3 Technical condition for equipment ................................. 5

2 INFORMATION .......................................................... 6

3 START UP ................................................................. 7
   3.1 Log in ..................................................................... 7
   3.2 Log off ................................................................. 7
   3.3 Users and roles ......................................................... 7
   3.4 Main menu ............................................................. 8
   3.5 Navigation footer ...................................................... 9

4 THEME .................................................................. 11

5 APP CREATOR .............................................................. 12
   5.1 Connecting hardware .................................................. 13
   5.1.1 Add sensor or winch .............................................. 13
   5.1.2 Remove sensor or winch .......................................... 14
   5.2 Setting up location ..................................................... 14
   5.2.1 Add and configure camera ....................................... 14
   5.2.1.1 Add sensors to a camera ..................................... 15
   5.2.1.2 Remove sensors from a camera ............................. 16
   5.2.2 Remove camera ..................................................... 16
   5.2.3 Add and configure camera location .......................... 16
   5.2.4 Remove camera location ........................................ 16

6 VIEW CREATOR ............................................................ 17

7 CONFIGURATION ......................................................... 20
   7.1 Alarm configuration ................................................... 20
   7.2 Winch Configuration .................................................. 20
   7.3 Sensor reset ............................................................ 21

8 CAMERA .................................................................. 22

9 ALARMS .................................................................. 24

10 LOG .......................................................... 28
   10.1 System log ............................................................. 29
   10.2 Debug log .............................................................. 29
   10.3 Audit log ................................................................. 29
   10.4 Alarm log ................................................................. 29

APPENDIX A - DEVIATION FORM ....................................... 30
APPENDIX B - NOTES ......................................................... 31
APPENDIX C - CAMBUIUM EPMP 1000 .................................. 32
APPENDIX D - RACK AKVACONNECT .................................... 33
1 SAFETY

Safety for the users of our equipment is main focus when AKVA group ASA develop new products and product manuals.

We strongly recommend that everyone who are going to be using the AKVA product, all who perform any type of repairs, service or other maintenance to AKVA products, and all who work in areas where such products are installed, are aware of the contents in this manual.

This recommendation is based on both personnel safety as well as a desire to keep AKVA products in order, and to avoid risk of damages as a result of not following safety instructions.

1.1 SAFETY SYMBOLS

**NOTE!**
Material damage - Symbol that signals a warning regarding a situation that may cause damage on equipment or surrounding items.

**TIPS!**
Symbol that signals useful hints and recommendations for effective use of the software.

**GO TO**
Click on the Underlined text to go to, or see page, section or other document for further instructions or more information.
1.2 PERSONNEL SAFETY

When remote controlling winch from the barge, anyone staying on the cage edge must be aware of this operation. Read both this AKVAconnect manual as well as user manual for camera with and without winch before installing and using these.

1.3 TECHNICAL CONDITION FOR EQUIPMENT

Camera, winch and other equipment shall never be operated when they are not installed properly. To prevent use of equipment that is not properly installed, follow the procedures in the applicable installation manual.

Equipment shall never be operated when they are not in perfect technical state. To prevent use of defect equipment, follow the procedures in the applicable maintenance manual.

If any of the equipment is operated in defective condition, safety features and availability will be weakened.

Manual for Akvasmart Camera with and without winch and other relevant manuals may be read and downloaded from www.akvagroup.com/products/user-manuals.

Use only original spare parts supplied by AKVA group. Unauthorized rebuilding and modifications of the equipment is strictly prohibited.
2 INFORMATION

This manual applies to AKVAconnect 4.0, and is to be regarded as part of the product equipment. Keep the manual for as long as your AKVA product is in use, and note any changes in the back of this manual as they are performed.

The purpose of this manual is to enable the user to install and use AKVAconnect in a safe and economically sustainable way. All instructions given in this manual must be followed. Site owner is responsible for keeping the manual available for all personnel as long as the product is in use.

Do not hesitate contacting us if additional information about installation, use and troubleshooting is required. If there are questions that are not answered in this manual, please contact us to find a solution to the problem. Contact our service department, your local supplier, your nearest AKVA office or our main office in Norway.

NOTE!
Some of the illustrations in this manual may differ from what shows on the screen. And although some illustrations have black theme and some will have the light theme, the contents of the illustrations will be the same.

NOTE!
This entire manual must be read and understood prior to installation of AKVAconnect, as well as used as aid during installation, use and troubleshooting.
3 START UP

3.1 LOG IN

Start up the program by clicking on the icon. To log in, type user name and password and click Login.

When someone has logged in, their user name will appear as an icon over the login setup. Click on the desired icon to select it, type the belonging password, and select Switch to log in.

Up to 3 previous users are listed over the login setup, as icons with names below.

When logged in, the user will be logged also when opening new browsers and windows. When a user logs off, they will be logged off in all active browsers.

3.2 LOG OFF

When a user signs out, they will be logged off in all active browsers.

3.3 USERS AND ROLES

A user is able to Add, Delete, Edit, Activate, Deactivate and Change role. The display will change the display according on access level for the user that is currently logged in.

4 different user groups:
- Basic users: only access to operate and view system components they have access to.
- Advanced users: have access to a limited menu.
- AKVA Engineers: have access to everything.
- Site manager: full access with admin tools. Will not see debug information.
3.4 MAIN MENU

The Main Menu icon consists of three parallel horizontal lines, and is found in the top left corner of the window.

Click the icon to open the Main Menu. For a user with basic access this menu will pop up:

AKVA Engineers will find the full menu, and Advanced users will have access to the limited menu:
3.5 NAVIGATION FOOTER

The Navigation footer is found in the bottom of a AKVAconnect window. When opening a view from the Main Menu, a tab will appear in the Navigation Footer.

For example, when Alarm is selected from the Main menu, the Alarm list will appear in the main view, and an Alarm tab will appear in the Navigation Footer.
When holding the mouse pointer over the tab, a pad lock symbol will appear in the left side of the tab.

![Alarms pad lock](image)

When the pad lock is open, and has no fill, the lock is open. This means that the tab will be removed when the Alarm view is closed. To lock the tab to the Navigation Drawer, click on the pad lock. This will change the pad lock appearance, it will appear locked, and will be filled with color.

![Alarms pad locked](image)
4 THEME

To change theme, click Main Menu and select Theme. This will change from light to dark theme, or from dark to light.

Example with the dark theme:

![Image of dark theme]

Example with the light theme:

![Image of light theme]
5 APP CREATOR

To open the AppCreator, click the Main Menu icon on the left, and select AppCreator to open.

A new window opens, showing all an empty AppCreator for the current site. Click on «Site Settings» and enter a name for the site. Here, the name is «Demo site».

SMS Sender

<table>
<thead>
<tr>
<th>Enable</th>
<th>Type</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teltonika-RUT240</td>
<td>IP: 192.168.223.150</td>
</tr>
</tbody>
</table>

If you have a teltonika sms sender you can set it up to send alarms on sms:
Check off Enable
Select type
Enter IP-adress
(See chapter 7 for details about the alarm configuration)
After making changes, such as adding or removing sensor, winch or camera, remember to always Generate Program, by clicking this button:
5.1 CONNECTING HARDWARE

1. Click on «HW Connections».

5.1.1 ADD SENSOR OR WINCH

To add a new sensor or winch:
1. Click on «Add sensor» or «Add winch».
2. Then select the type of sensor or winch from the drop down list shown in type.
3. In configuration, select the ADIO2 card the device is connect to, or enter the IP to the device.
   If the device does not appear, press «F5» on your keyboard to reload the drop down lists.
4. Click on the green «Generate program» button to make your changes permanent.

Here, one sensor and one winch is added:
5.1.2 REMOVE SENSOR OR WINCH
To remove a sensor or winch, click on the red cross to the right for the device that is going to be removed.

Click on the green «Generate program» button to make the changes permanent.

5.2 SETTING UP LOCATION
Click on «Location setup» in the «App Creator». This is where the cameras are added and grouped together for different locations. A location example is a specific pen, but it could also be all top cameras, surface cameras and similar.

5.2.1 ADD AND CONFIGURE CAMERA
Click «Add cameras» in the Location setup area.

Name the camera and select the physical camera in the Device column. Here, it is also possible to connect one winch (select from the drop down menu) and sensors (see section 6.2.1.1 Add sensors to a camera) to the camera.

Here is an example of three cameras with winches and sensors set up in AKVAconnect:
5.2.1.1 ADD SENSORS TO A CAMERA

Click the green and white + symbol in the Sensors row to open this window:

Here are all available/created sensors are.
Filter among the sensor types to make it easier to find the right sensor, by clicking on the desired tab. For example: click on Temperature to find all available temperature sensors.

«Pen 1 UW» are default sensors installed in underwater cameras, these sensors read temperature and depth.

To add a sensor, click on the desired sensor and the click on «Add sensor»

Click the green «Generate program» button to make the changes permanent.
5.2.1.2 REMOVE SENSORS FROM A CAMERA

To remove a sensor from a camera, click on the black and white X next to the sensor name.

![Pen 1 UW](Pen 1 UW)

5.2.2 REMOVE CAMERA

A red cross is found to the right of every camera row. Click this cross to remove the current camera.
Click the green «Generate program» button to make the changes permanent.

5.2.3 ADD AND CONFIGURE CAMERA LOCATION

Click «Add location».

<table>
<thead>
<tr>
<th>Camera locations (1)</th>
<th>Add Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Group</td>
</tr>
<tr>
<td>Pen 1</td>
<td></td>
</tr>
</tbody>
</table>

Change the default name if needed. Here «Pen 1» is default name. To add cameras to the location «Pen 1», click on the desired camera name(s). Here, three are cameras added to the location Pen 1:

<table>
<thead>
<tr>
<th>Name</th>
<th>Group</th>
<th>Cameras</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pen 1</td>
<td></td>
<td>Pen 1 Surface camera</td>
</tr>
</tbody>
</table>

5.2.4 REMOVE CAMERA LOCATION

A red cross is found to the right of every location row. Click this cross to remove the current camera.
Click the green «Generate program» button to make the changes permanent.
6 VIEW CREATOR

It is possible to select five different layouts, showing 1, 2, 3, 4 or 6 camera view layouts.
1. Name the layout, for instance “3 split”.
2. Choose Camera Ratio (must be in accordance with the cameras that are going to be used in this particular view).
3. Choose Layout for the view.
4. Click Create view to set up, and the set up will appear in a new window.

Here is an example of how the view will look like. The view name is “3 split”, ratio is set to 16:9, and layout with 3 split is chosen.
In the top left corner is a menu called ‘select’. Here it is where the cameras are added to the view. Click ‘select’ and ‘More’ and the camera selection window will appear.

In the ‘Other sources’ list, select the correct Pen, and the cameras that are connected to this pen will appear in a list in the right side of this window:
All views will have the possible camera sources available for selecting.

Selecting the All-source will enable the user to select all cameras, in the order they are set up in the AppCreator.

Selecting the Pen 1-source will enable the user to select all cameras listed in Pen 1 = Surveillance, Up and Down, as set up in the AppCreator.

Selecting the Pen 2-source will enable the user to select all cameras listed in Pen 2 = Surveillance, Up and Down, as set up in the AppCreator.

It is possible to add the same source to several views.

Click Save & open when all views have a source selected.
7 CONFIGURATION

To open the configuration, click Main Menu and select Configuration. A new window opens, showing Alarm configuration, winch configuration and sensor configuration.

7.1 ALARM CONFIGURATION

Here is an example of how the alarm configuration window may look like:

![Alarm Configuration Window](image)

Alarm configuration contains 2 different groups. The PLC alarm with light control and horn, requires process control. SMS sending based on alarm level, requires SMS sender.

7.2 WINCH CONFIGURATION
Here is an example of how the Winch configuration may look like:

![Winch Configuration](image)

In this configuration it is possible to adjust the default speed settings for the winch. Remote is the control from AKVAnnect4 and local is the control from the local button panel on the winch. Low and high speed adjust the difference in speed between the WinchV5 drums to keep the camera in approximately the same depth. Low speed is also used when controlling the winch up and down.

### 7.3 SENSOR RESET

And here is an example of how the sensor configuration may look like:

![Sensor Configuration](image)

The “reset depth sensor” button configures the current depths as the new zero. It is therefore important to Reset the depth sensor in the surface.
8 CAMERA

Click on the Main Menu icon and select Camera.

If a 3-split is selected in the ViewCreator, a window similar to this one will appear:
When cameras are added to the views, the video images will appear on the screen after a few seconds. If several cameras are selected for the same view, the image will be shown in the order they are set up.

In the top banner of each of the 3 views, the source for the current source will show. Here the large view shows All, and the two smaller ones show Pen 1 and Pen 2. Next to the source name, is the icon used to change through the various cameras that are added to the selected source.

Next to the source name, is the icon used to change through the various cameras that are added to the selected source.

And next to this “rotate” symbol, is the name of the current showing camera. Here: Camera 1.

In the right part of the top, all sensor information is listed. Temperature, current, depth and oxygen levels may be selected, and these are set up in the AppCreator.
9 ALARMS

To open the alarms, click Main Menu and select Alarm. A new window opens, showing all alarms that are activated in the program.

Alarm types:
AKVAconnect 4.01 has defined 4 levels of severity and priority for alarms. These levels also have colour codes for simple perception for how severe the alarms are.

<table>
<thead>
<tr>
<th>Prioritized</th>
<th>Severity</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Critical/safety</td>
<td>Red</td>
</tr>
<tr>
<td>P2</td>
<td>Critical/environment/equipment</td>
<td>Orange</td>
</tr>
<tr>
<td>P3</td>
<td>Non critical environment/equipment</td>
<td>Yellow</td>
</tr>
<tr>
<td>P4</td>
<td>Maintenance alarms</td>
<td>Cyan</td>
</tr>
</tbody>
</table>

P1 alarms will show as red alarm boxes in the alarm banner in the camera view window. This alarm type will stand out from the rest of the alarm types by also colouring the entire top line of the camera view window. Here is an example of what a P1 alarm will look like in the top of the window:

![Example of a P1 alarm]

The P1 alarms will appear white in the alarm banner, so that it will stand out from the red top background.

When alarms appear, up to 3 alarms will appear in the alarm banner. These will be colour coded, according to the priority for the alarm type. The alarm text will tell the user what is wrong and where, to make troubleshooting and correction operation as simple as possible.

Clicking the alarm bell will open the alarm list. The alarm bell will have a number next to it, telling the user how many alarms are active at the current time. Here, 7 alarms are active, and one or more of the alarms are level P1, showing as the red background. If more than 9 alarms are active, the number will show as “9+”. 

![Alarm bell with number]


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revision no: a
When using the light theme, and no active P1 alarms, the bell and its background will be white. And when using the dark theme, and no active P1 alarms, the bell and its background will be dark grey.

Here is an example of a P2 alarm:

![Example of a P2 alarm]

**Explanation for the various information:**
Counter is zero = alarm text, explaining why the alarm is set off  
P2 = severity and priority (critical/environment/equipment)  
12:51 = time for when the alarm was set off  
Winch = source of the problem  
> = click on the banner to go to the alarm list  
Orange colour = P2 alarm

To look at all alarms, simply click on one of the alarm text in the top of the window, or go to Main Menu, select Alarms. This window appears:

![Alarm list]

This alarm list shows all active alarms. Status is set to New for all, and the first column cells are all filled with colour (around the check box). These are both indicators that the alarms has not been acknowledged.

To acknowledge one alarm, click the check box in the first column for the desired alarm row and click the Acknowledge selected button below the alarm list.
It is also possible to acknowledge several or all alarms. To acknowledge several alarms, click the check boxes in the first column for the desired alarm rows and click the Acknowledge selected button below the alarm list.

To acknowledge all alarms, click the check box on top of the first column, and all boxes below will be checked. Then, click the Acknowledge selected button below the alarm list.

Acknowledged alarms will appear white with a coloured frame in the first column (around the check box). The colour here is the same as the alarm colour, red for P1 alarms, magenta for P2 alarms and so on.

Here, the top P3 alarm is not Acknowledged, and still has the yellow fill colour around the check box in the first column, and status is still “New”.

The four next P3 alarms are acknowledged, and this can be seen as white fill inside a yellow cell, and Status says they are “Ack” (acknowledged).
<table>
<thead>
<tr>
<th>Timestamp</th>
<th>System</th>
<th>Source</th>
<th>Log Entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019-12-18 12:53:33</td>
<td>Controller</td>
<td>CCoordinator::SetObj::State50()</td>
<td>Missing site settings</td>
</tr>
<tr>
<td>2019-12-18 12:53:33</td>
<td>Controller</td>
<td>CCoordinator::SetObj::State50()</td>
<td>Reconfigure Completed</td>
</tr>
<tr>
<td>2019-12-18 12:53:33</td>
<td>Controller</td>
<td>CCoordinator::AdWriteInt()</td>
<td>Received Generate Program Command</td>
</tr>
<tr>
<td>2019-12-18 12:52:42</td>
<td>Controller</td>
<td>CCoordinator::SetObj::State50()</td>
<td>Missing site settings</td>
</tr>
<tr>
<td>2019-12-18 12:52:42</td>
<td>Controller</td>
<td>CCoordinator::SetObj::State50()</td>
<td>Reconfigure Completed</td>
</tr>
<tr>
<td>2019-12-18 12:52:42</td>
<td>Controller</td>
<td>CCoordinator::AdWriteInt()</td>
<td>Received Generate Program Command</td>
</tr>
<tr>
<td>2019-12-18 13:59:23</td>
<td>Controller</td>
<td>CCoordinator::SetObj::State50()</td>
<td>Missing site settings</td>
</tr>
<tr>
<td>2019-12-18 13:59:23</td>
<td>Controller</td>
<td>CCoordinator::SetObj::State50()</td>
<td>Reconfigure Completed</td>
</tr>
<tr>
<td>2019-12-18 13:59:23</td>
<td>Controller</td>
<td>CCoordinator::AdWriteInt()</td>
<td>Received Generate Program Command</td>
</tr>
<tr>
<td>2019-12-18 13:40:38</td>
<td>Controller</td>
<td>CCoordinator::SetObj::State50()</td>
<td>Missing site settings</td>
</tr>
<tr>
<td>2019-12-18 13:40:38</td>
<td>Controller</td>
<td>CCoordinator::SetObj::State50()</td>
<td>Reconfigure Completed</td>
</tr>
<tr>
<td>2019-12-18 13:40:38</td>
<td>Controller</td>
<td>CCoordinator::AdWriteInt()</td>
<td>Received Generate Program Command</td>
</tr>
</tbody>
</table>
10 LOG

To open the Log, click Main Menu and select Log.

Explanation to LOG system alarm:
- The Timestamp column shows the time for when this exact system log entry was logged.
- The Source column shows where the system log entry was logged from.
- The System Log Entry column shows what entry that was logged at this time and from this source.
- Download System Log - will download a text-file of the relevant entries
10.1 SYSTEM LOG
- Contains valuable information for troubleshooting the system.
- System log displays information about actions performed manually by users, and automatically by the system. Examples are, "Sent alarmSMS to …", "Automatic feeding to cage #..."

10.2 DEBUG LOG
- Contains valuable information for troubleshooting the system.
- Debug log shows information that can be useful to see how the system behaves in detail.
- Information here is only helpful for AKVA group technicians.

10.3 AUDIT LOG
- Audit log gives information of all the users in the AKVAconnect system.
- The audit log shows all actions concerning process and configuration performed by the users of the AKVAconnect system 4.1.0.0.

10.4 ALARM LOG
Contains a list of all alarms that have been triggered in the system.
### APPENDIX A - DEVIATION FORM

<table>
<thead>
<tr>
<th>Deviation control number:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Producer:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prod. No.:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>Purchase year:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Deviation description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Follow up proposition:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date and signature, declarer:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Follow up directed:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Status:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New action for deviation:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date and signature, declarer:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C - CAMBIUM EPMP 1000

Illustration 3.9: Drawing related to Cambium ePMP 1000 manuals
# About AKVA group

AKVA group is present in all markets with offices in Norway, Chile, Denmark, Scotland, Spain, Greece, Iran, Iceland, Canada, Australia and Turkey. AKVA group is a unique partner with the capability to offer both pen farming and land based aquaculture operations with complete technical solutions and service.

By developing technology focused on solving the biological challenges, we contribute to the continued development of a sustainable industry. Good operational performance and fish welfare are paramount in achieving good results, and investing in our technology will help deliver both.

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