AkvaControl v10
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1 Preface

The AkvaMarina feeding system is a fully automatic centralized feeding system developed for use on fish farms. The system transports the feed to each unit by the use of air.

The controls are normally located indoors, whereas the mechanical equipment is often placed outdoors. This makes the system user friendly at the same time as it is protected against the weather.

The system can feed almost unlimited number of units (depending of number feed lines, PCs, ADIOs etc.) via hoses with lengths of up to 1400 m. Maximum hose length depends on the type and size of the blower. Each unit may be treated individually in terms of the size and amount of feed, and all desired changes are simply done from the keyboard.

The AkvaMarina system is managed from a dedicated computer that processes and stores all data for the units.

By using the AkvaSensor, (AkvaSensor Doppler or AkvaSensor CAS and Akvasmart Software), the feeding is automatically regulated for optimal utilization of the feed. This provides the fish farmer with the opportunity for greater productivity and full control of the feeding!

The purpose of this user manual is to assist the operator with daily operations. We hope it will be of help if any problems should arise. In the event that you cannot find an answer here, please call the Service Department at AKVA group ASA for assistance and guidance or contact your local department of AKVA group ASA

Telephone: +47 5177 8500 (Main office)

In order to best familiarize yourself with the features and possibilities that your AkvaMarina system provides we recommend that you sit in front of the PC and the keyboard when you read through this manual. It is easier to remember what you read when you have a chance to try it out on the PC at the same time.

If you find errors, or if something in this manual is unclear, please don’t hesitate to call us.

We are convinced that you will soon fully appreciate your AkvaMarina feeding system and the opportunities it provides and we wish you good luck with your fish farming efforts.

AKVA group ASA
2 Help for AkvaControl
AKVA group ASA has created this help file along with a printed user manual. You can access this file whenever needed. To locate the help file, just press help in AkvaControl and a help window will pop up. You can also click help in several windows and you will be taken directly to the corresponding section in the help file.

There is also a possibility to search within the help file, and thereby you can easily locate what you’re searching for.

The purpose of this user manual is to assist the operator with daily operations. We hope it will be of help if any problems should arise. In the event that you cannot find an answer here, please call the Service Department at AKVA group ASA for assistance and guidance or contact your local department of AKVA group ASA.

Contact your local department of AKVA group if it exists or else contact AKVA group in Norway.
Telephone: +47 5177 8500 (Main office in Norway)

3 Basics
Microsoft Windows® is a PC operating system. There are other types of operating systems, but today MS Windows is the most common.

The idea behind Windows is that the user has a graphic interface that provides a good overview and simplicity.

Instead of using advanced commands, Windows uses menus and buttons to execute actions. These buttons are called icons and by clicking on them you may for example start a program that is installed on the computer.

4 PC system requirements
1GB RAM
Minimum 60GB available hard disk storage
MS Windows® XP or MS Windows® Vista
2 USB ports available
5 Before the first start

5.1 Connecting hoses to selectors and units
The hoses should be laid out before a service technician from AKVA group ASA visits to start the system. This is important since the staff would otherwise direct much of their attention to the laying out of hoses instead of on the training.

Correct distribution of hoses is very important and must be done properly to avoid unnecessary problems and perhaps stoppages. As far as possible, try to lay the hoses as straight as possible without unnecessary bends and allow enough slack in the pipes to compensate for high tides and strong currents.

It is important to avoid breaks on the hoses. If it should happen, cut away the broken section and splice the hose with a splicing sleeve.

5.2 Electrical
The electrical power supply must be ready before a service technician from AKVA group ASA arrives to start the system for the first time. The rated power of this supply will depend on which AkvaMarina feeding system has been chosen. Consult your local electrician as he will be familiar with the location and any special conditions that need to be considered.

5.3 Building
The building/control room must also be ready before a service technician from AKVA group ASA arrives to start the system for the first time. The AkvaMarina feeding systems are very flexible regarding placement. The mechanical equipment can just as easily be located outside as inside. The only requirement is that the control room is ready and that this is an “office”-like room.

5.4 At the initial start-up
An AKVA group ASA service technician will install/start the installation together with you. Training will take place in parallel with the installation and it is therefore very important that a minimum of two of the personnel that will use the equipment after the installation are present during the entire installation and training period.

All the mechanical equipment is installed before a local electrician will have to connect all the motors.

Then you and the service technician together will adjust/install all necessary system settings, fish data, etc. In this regard it is necessary for the following data to be available:

- Fish data, such as the number of fish, average weights
- Distances to the various units
- Desired feeding regime
6 Terminology

6.1 Adaptive feeding
Requires pellet sensor. This setting controls your feeding automatically, where you set the limits required for the system to increase/decrease feed rate and stop feeding, based on the pellet signals. Different strategies within this setting can be chosen.

6.2 ADIO
Analogue/Digital/Input/Output module: These cards convert the data sent from the CCS into commands which controls the different components. (Blowers, dosers and selectors)

6.3 Air Monitoring
Monitoring of air speed, temperature and back pressure to optimize pellet transport in order to avoid clogged pipes and pellet breakage. Automatically stop dosing before clogging, based on high/low pressure limits.

6.4 Attendance feeding
This is a feeding strategy. ‘Feeding of one unit at a time to satiation’. In other words, we dedicate the entire feed line capacity to one unit at a time, staying on that unit for the duration of a meal before moving on to the next unit.

6.5 Backup
- **Save AkvaControl system setup**
  All the settings in AkvaControl are stored and executed on your CCS (feeding computer). This backup function saves a backup from the settings on your feeding computer and stores it in your AkvaControl program. The backup can be given a name so you can find it in a later occasion.
- **Restore AkvaControl system setup**
  This function restores any previous backups you have saved from your feeding computer. All available backups will appear in a list with date when created and name (If written) of the backup in front.
- **Create an external backup of all logs**
  This is a complete backup of all data registered in AkvaControl. It's important to save a backup to an external USB memory stick once a week in case your computer should fail. This backup can only be restored through the AvaAdm32.exe program (Chapter 25).

6.6 Blower
This unit provides a continuous air flow through the pipe system, allowing the feed to be transported through the system to feed each unit on the site.
6.7 Cleaning pipes
You find this in manual feeding. This is a function for maintenance of the pipes. If you e.g. fill the pipe to a unit with water, this function will allow you to blow the pipe with a set blower speed to clean the pipe.

Note! Water is only to be filled in pipes from the outlet of the selector and out to units, NOT before the selector.

6.8 Cyclic feeding
This is a feeding strategy. ‘Feeding of multiple units in a group in parallel by visiting them repeatedly in a cyclic pattern’. This method gives each unit many visits with small doses through each meal.

6.9 CCS2
‘Centralized Control System Computer’. This is the feeding computer. All functions programmed in AkvaControl will be stored and executed here. The CCS communicates with the ADIOs to the different components (Blowers, dosers, selectors).

6.10 Doser
Feed distribution unit. This unit distributes the feed amount, programmed in the software, to the different units.

6.11 Fasting
This function is to be used if you want to exclude a unit from your feed plan. The unit will not be fed and will not be calculated in the time estimate.

6.12 Feed line
A centralized feed system contains one or multiple feed lines. Each feed line has ONE pipe from the blower to the silo/doser(s) and ends up at the selector valve where multiple pipes can be connected for further transport to units.

It’s important to keep in mind that one feed line can only feed one unit at a time!

6.13 Feed rate
Speed while feeding: The rate that the dosers is set to distribute the feed to the units. This can be shown as kg/min, kg/ton/min or pellet/fish/min.

6.14 Feed tables
Tables consisting of how much feed required (In % of bodyweight) with different temperatures and size of fish. These tables can be used in AkvaControl to decide the
feed amount for your fish size. If you have a temperature sensor connected, amount can be calculated directly from a feed table.

6.15 **Feeding groups**
Each group will have its own meal set-up. Groups can consist of one or multiple units. If you want total individual treatment for the units, you can have one group pr. unit.

6.16 **Fish Groups**
If e.g. you have different types of fish, or fish from different suppliers on your site, these can be separated into different fish groups. This has no impact of feeding and is only for your own information on reports and site summary.

6.17 **Max time between visits**
In cyclic feeding: This is the maximum time it will take from the system visiting a unit till it come back to visit the same unit again.

6.18 **Manual feeding**
You may use an AkvaMarina feeding system for manual operation, where you choose unit, feed rate and feed amount manually. This may be of interest where you use camera or pellet sensors to satiate the fish, or when you use AkvaRemotePC or some other remote control.

6.19 **Meal**
Period of time during the day you want to feed your fish. You need to set up at least one meal for each group to be able to feed.

6.20 **Selector**
This is the component which directs the feed to the different units.

6.21 **Supplementary feeding**
This is a meal you set to start after the other meals in the feed plan are finished. To be used if the fish is not satiated from the daily amount fed. If you do the settings for supplementary feeding before you start feeding that day, this will not show in the site summary as expected amount to be fed that day. But it will show up as kg automatically fed that day when finished. The amount set will be cleared when fed.

6.22 **Transport time**
The time required for the feed to move between:
- Silo and selector
- Selector and unit(s)
Transport time must be measured. Start the clock when the pellet leaves the selector, stop when the pellet reaches the outlet of the pipe in the unit. If it takes 10 seconds, time can be set to e.g. 12 seconds in AkvaControl as a safety margin. Pellet speed
shall be approx. 10-15 m/s. By using this you can calculate the transport time if you know the distance of the pipes. But always double check this by measuring.

**Installation of AkvaControl**

You must be logged on the PC as **Administrator**. Insert the following installation CD.

Plug in the USB cable from the CCS2 to your PC. Install the USB driver from the installation CD. If Windows detects a newer available driver, **DO NOT USE THIS.**

If installation does not start automatically, search for the USB driver on the CD.

Choose the 'InstallAkvaControl' icon if installation does not start automatically.

**Note!**
If using Windows Vista:
<Right click on the installation file, choose: Run as Administrator>

**FIGURE 1**

**FIGURE 2**

Start on top of the list with:

1. Install Microsoft SQL Server 2005 Express

**FIGURE 3**

Extracting files...
Progression of SQL server installation…

When SQL server is installed, proceed to:

2. Install AkvaControl Database Tables (Log files)

<Click yes> to verify.

When finished choose:

3a. Install AkvaControl CCS Program Files - Registered Version

Select preferred installation language.

Note:
Language can also be changed in the program after installation has been completed.
The wizard takes you through the next steps, click next to proceed.

Enable adaptive feeding if you have some kind of sensors that you will use to control feeding: E.g. Doppler, IR...

Fill in the registration details. If you don’t have the correct license available, this can be done later by contacting AKVA group. The program will run as an unregistered version.
If you have a remote control connected, choose the connection.

*Click ‘execute’* to start installation.

Progression of software installation

Software installation is now complete. The next steps will upgrade your feeding computer (CCS2)
The software automatically detects your new program version file. Your feeding computer (CCS2) will now get the correct version.

When the feeding computer is upgraded, wait 20 seconds before starting AkvaControl. Installation is now complete.

Correct the date on your CCS2.

<Click on the PC → CCS button>. This will give the CCS the same time as your PC.
6.23 Upgrade AkvaControl within the same version

Before you start upgrading, you have to make a copy of the existing AkvaControlCCS folder and put it on a safe place (USB memory stick). **Do not remove the folder!**

Insert the following installation CD. Choose the 'InstallAkvaControl' icon if installation does not start automatically.

---
**Note!**
You must be logged on the PC as **Administrator**.

If using Windows Vista:
<Right click on the installation file, choose: Run as **Administrator**>

---

Choose:
- Upgrade existing AkvaControl CCS installations

---

Mark the destination of your current installation and click **Upgrade selected**

---

- Upgrade selected
- Search for AkvaControl
- Cancel
Select installation language

Choose automatic upgrade

You existing files will be stored in your AkvaControl CCS folder.

Installation progression of software files will appear like this
Software installation is now complete. The next steps will upgrade your feeding computer (CCS2).

<Click yes> to proceed

The software automatically detects your new program version file. Your feeding computer (CCS2) will now get the correct version.

Upgrade is now complete!
6.24 Upgrade AkvaControl from V9 to V10
This is to be done by a Service Technician only

6.24.1 Backup
1. Save AkvaControl system setup
2. Create an external backup of all logs to an USB memory stick
3. Close AkvaControl

6.24.2 Zip AkvaControl CCS folder
1. Right click on AkvaControl CCS folder
2. Choose -> Send to Zipped folder
3. Place it in e.g. my documents
4. Take a copy of the folder to an USB memory stick, but do not remove the folder!

6.24.3 Switch CCS with CCS2
1. Shut down main power switch on main cabinet and 24V interrupter inside
2. Remove all plugs from the CCS
3. Switch blue and white cable on the plug connected to network cable/k-net
4. Connect + wire on the leftmost side on the same plug and – wire on the right side of +
5. Connect the plug in k-net1 on CCS2. Switch on main power and 24V interrupter.

6.24.4 Install USB driver (communication CCS2 ->PC)
1. Connect the following USB cable from CCS2 to PC
2. Insert the installations CD
3. ‘New hardware found’ will show up
4. Search for the driver on the CD drive

6.24.5 Install AkvaControl V10
1. Double click the icon: Install AkvaControl
2. Start on top with SQL-server and proceed with the list
3. Remember to convert database. If sensor log and/or feeding log contain a lot of data, they may need to be converted over night

6.24.6 Start AkvaControl
1. Open AkvaControl. If the program doesn’t start, open the program CCS2upgrade in your AkvaControl CCS folder and write down the name of the USB connection (AKPxxxxxx). This name must be set as CCS port in the AkvaControl.ini file
2. When AkvaControl is opened, restore AkvaControl system setup. Choose the latest backup on the list.
7 System layout

7.1 Manually

As an example I will create a Quattro system (4 feed lines) built like this:

Line 1: Blower 1 – silo 1 – silo 2 – selector 1 – units 01, 02, 03, 04
Line 2: Blower 2 – silo 3 – silo 4 – selector 2 – units 05, 06
Line 3: Blower 3 – silo 5 – selector 3 – units 07, 08, 09
Line 4: Blower 4 – silo 6 – selector 4 – units 10, 11, 12

I will also show how sensors are connected and how they can control feeding.
The feeding strategies: Attendance- and cyclic feeding will be explained.

-------------------------------------------------------------------------------
Note!
For cage/tank I will use the word ‘unit’ in this document.
7.1.1 Blowers

- Choose the 'Add new system unit' icon
- Start on top of the list
- Select blower
- Number of units = 4

- The 4 blowers will appear on the bottom of your screen
7.1.2 Silo/dosers

- **<Click on the ‘position units’> button**
- Move the blowers away from the bottom and place them on the left side on your screen.
- To get out of the ‘position unit’ menu, simply click the icon again.

Click the add new system unit icon

- Choose silo/doser and choose number of units = 6
7.1.3 Selectors

- Start building towards right. Place feed line 1 on top, feed line 4 at the bottom.

- Choose selector and number of units = 4
7.1.4 Cage/tanks

- Place them to the right of the silo/dosers

- Choose cage/tank unit and number of units = 12
- Place the units to the right of the selectors they are connected to
7.1.5 Connect the units

Choose the ‘connect units’ button:

FIGURE 41

- Pay attention to the text on the top of your screen
- Select **FROM** blower, **TO** silo. **FROM** silo **TO** silo. **FROM** silo **TO** selector.

FIGURE 42

- When you click **FROM** selector you must type the number of outlets you have on the selector.
7.1.6 Sensors

Click the ‘add new system unit’ button:

Select temperature sensor from the list, repeat for current sensor. Move the sensors near the unit/CSU they will be connected to:

- Select the outlet you wish to connect your unit to

- When all lines are connected your system layout can look like this:
A connection between the different components has now been made.

You must now connect the different components to their corresponding ADIOs.

- If you want the sensors to control feeding in all units, you must create a connection between both sensors and the units
  - <Click the 'connect units'> button
  - <Click FROM sensor TO unit>
  - Remember to connect all units
  - Repeat for the other sensor

- Your connections are now marked with a line
You find the addresses on the ADIO cards in the main cabinet. If more than one unit can be connected to the same ADIO (Blowers and Silos) the serial number will have an extra “/1”, “/2”, “/3” and “/4” at the end. “/1” is the first (leftmost) connection (I.e. silo 1) “/2” is the second, and so on.

### 7.1.7 Connect units to ADIO board

#### FIGURE 47

Choose the ‘connect unit to ADIO board’ icon:

---

Choose the correct addresses from the list that appears on all your units/components:
- Power supply
- Blowers
- Silos/dosers
- Selectors
- Sensors

- If you have a CSU connected to some of the units you must click on the unit and select the address that is written on the CSU.

- When you connect a CSU, this will be marked with a symbol on the unit.

---

*Note: The sensors must have the same ADIO address as the CSU they are connected to*
7.2 Wizard for creating feed lines

In your system layout: <Click on the icon ‘wizard for creating feed lines’>

Feed line:
- You may use the ‘defaults’, the feed lines will then be named Feed line 1, 2 etc.

Silo/Dosers:
- Select the numbers of dosers in the feed line

Selectors:
- Set the number of outlets on your selector.

Units:
- If you have more than 9 units in your system it might be necessary to start numbering from 01, not 1. This because the computer sorts the units alphanumeric in reports/lists.

Reports will look like this

<table>
<thead>
<tr>
<th>Without 0 in front</th>
<th>with 0 in front</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1</td>
<td>Unit 01</td>
</tr>
<tr>
<td>Unit 10</td>
<td>Unit 02</td>
</tr>
<tr>
<td>Unit 11</td>
<td>Unit 03</td>
</tr>
<tr>
<td>Unit 2</td>
<td>Unit 04</td>
</tr>
<tr>
<td>Unit 3</td>
<td>Unit 10</td>
</tr>
<tr>
<td>Etc.</td>
<td></td>
</tr>
</tbody>
</table>

Selector – select outlets

- Select the outlet number you wish to connect your units to
- Edit unit names if you wish by right clicking on the names
Feeding groups:

Choose feeding group name. Since feeding lines are named by numbers (1, 2 etc.), it might be necessary to name feeding groups by letters (A, B etc.)

If you wish to split units within the same feed line into different groups, this can be done manually afterwards.

Feeding regime:

Select your feeding regime. This can also be edited afterwards if you make a wrong choice.

Layout:

Choose the symbols that suit your site. Size on symbols can also be adjusted.

Select the number of rows you want your units to be placed in.
- The feed line will appear at the bottom of your screen
- **<Click the ‘position unit’ button>**
- Hold down ‘Ctrl’ button while clicking on the feed line to mark the entire line
- Move the entire line up from the bottom.

- To get out of the ‘position unit’ mode, simply click the icon again
- To create the other feed lines: repeat step
Your complete setup may look like this:

7.3 **Wizard for connecting components to ADIO boards**

In your system layout: Click on the icon ‘wizard for connecting components to ADIO boards’

- The wizard takes you through all the components, simply choose the correct addresses from the list that appears and click next.

- Remember to connect the sensors to the same address as the ADIO on the CSU they are connected to.

- When all the components have been assigned their correct ADIO addresses, click ‘**Execute**’.
8  Set component/unit parameters

All the units have a variety of parameters that has to be properly set. This chapter describes each unit, and which parameter to set.

8.1  Blower

- Select the ‘Edit all system components’ icon

This may look the same as the system layout, but here you can edit the component settings.

To get access to a component simply click on one

Blower: It is not necessary to edit these settings, click the ‘Feed line’ button to proceed to settings that need explanation.

Feed progress display period: Defines how long period of time to display on the progress bar in the site overview for each unit. This progress bar will scroll during the day to show the last number of minutes that you set.

Feed rate axis maximum: Defines the maximum height of the progress bar shown in site overview.

See chapter 14 on axis adjustments for more information.
8.2 Silo/doser

8.2.1 Pulse dosing

Warning when below:
The silo will be coloured yellow in site overview when it reaches the warning limit.

Speed while pulsing:
If you want to feed at a very slow rate, this speed can be decreased. Requires doser calibration if adjusted. (40% in minimum)

Pulse ON time:
Defines the number of seconds the doser will be running. (0.5 seconds is minimum)

Minimum pulse OFF time:
Defines the minimum time the doser can wait between pulses. (0.5 seconds is minimum)

Max rate profile axis value:
Adjusts the resolution of the feed rate bar:
100-1500 g/s
Try what suits you best, requires no calibration when adjusted. (See chapter 14.2)

Use pulsing when the feed rate is below:
This is a safety function for the doser engine where the doser switches to pulsing when speed is below 20%.

Note!
Do not edit this 20% limit

---

8.2.2 Variable rate dosing

---
8.3 Selector

**Slow speed:**
Speed when selector moves between 2 holes.

**Fast speed:**
Speed when selector moves between more than 2 holes.

**Selector time out:**
A safety function that stops the selector when not finding the correct position.

**Run time after lock signal:**
For correct positioning. (Value between 0-10)

*Note!
The settings above are only to be edited by a Service Technician*

---

8.4 Units

**Allow shortcut between first and last:**
Makes the selector move the shortest distance between last and first hole

**Feed calculation:**
Set feed calculation method.

If Feed/growth table shall be used, make sure a temperature sensor is connected.

- Sensor connection can also be made here if you have added a sensor in the system layout and connected it to the correct ADIO address.
- Select feed table to be used
- See chapter 23.2 on feed tables

**Feed rate profile:**
If you use multiple bars to decide the feed rate, only first bar will be used if the feeding is less than the limit set here.
**FIGURE 69**

Pellet sensor:
Choose which pellet sensor to use from the list.

**FIGURE 70**

Camera
If you have a CSU connected, select the video transmission channel and camera cycles.

**FIGURE 71**

Current
If you want current to stop feeding at a certain value, this must be entered here.

Sensor connection can also be made here if you have added a sensor in the system layout and connected it to the correct ADIO address.
Oxygen
To be used if you want oxygen sensor to stop feeding if it’s less than the value entered here.

Sensor connection can also be made here if you have added a sensor in the system layout and connected it to the correct ADIO address.

Volume:
This highlights the biomass yellow, in unit details, when density is exceeded.

Blower speed when feeding this unit:
This must be tested for each unit to get the desired pellet speed and spreading area.

Adjust transport time:
The time required from the pellet leaving the selector to reaching the outlet of the pipe in the unit.

This must have a safety margin of at least a few seconds to avoid blockings in the pipe. Pellet speed shall approximately be 10-15 m/s for optimal transport.
Temperature sensor:
If you have an external temperature sensor this can be typed in when you ‘Enter temperature manually’
This is if you want to feed by the use of feed table, or want the temperature to be logged in your database.

Alarm limit:
- Highlights the sensor yellow in site overview when it reaches the value set here.

Current sensor:
Flow can be entered manually for storage in your database.

8.5 Biomass settings

<Click on a unit in ‘Site overview’>
- Set number of fish and average weight in all units.
- Edit feed conversion ratio if you wish.
8.6 Feeding settings

<Right click on a unit in 'site overview'>
Choose feeding settings

Check that the unit has received the daily amount calculation (chapter 8.4).

Connect silo.

Choose numbers of bars in the feed rate profile.
  - 1 bar gives you one feed rate during each visit (Often used on small meals)
  - Multiple bars give you the possibility to have different feed rates through the visit/meal. (Often used in large meals)

Adjust height of the bar(s) to decide speed while feeding

With multiple bars, like shown here, you can start the meal with a low feed rate. During the meal the feed rate increases and then decreases at the end of a meal.

This is often used on when feeding big fish where you have few, large meals.
8.7 Maintenance

All units have a maintenance button. Use this for registering maintenance done on the different units/components. By using this you can keep track of when e.g. oil was last changed on the blowers, dosers cleaned etc.

Blowers, dosers and selectors have automatic hour meters. For other types of equipment like generators you may enter the hour meter manually.

Register events related to the equipment by day and hour meter value, such as service and maintenance.

<Click on the: ‘Register event’ button.>
Choose which event from the scroll down list. Hour meter value and comment can be added.

A report can be printed for all maintenance done. See chapter 15.7 on maintenance reports.
9 Test system setup

To check that all system components have received their correct ADIO addresses, you can test the machinery manually. This is to be done before you fill the silos.

9.1 Print system layout

9.2 Component settings overview

If you not have a printer connected, make a simple sketch/drawing of the system layout.

Choose the ADIO button. Write down the ADIO addresses on the: Blowers, silo/dosers, selectors and CSUs on your printout/sketch.
9.3 Control machinery directly

FIGURE 84

To get access to a component simply click one, it will appear at the left side of the window.

All feeding will be stopped when entering this menu.

FIGURE 85

Blower:
Set speed and click ‘>’
- The blower in feed line 1 shall now start.

Silo/Doser:
Set rate and click ‘>’
- Go and check that the chosen doser is running.

VariDoser: When rate is set to 0%, only the lower engine is running. This can be used to prevent feed from coming out of the doser while testing.

Selector:
Click ‘+’ or ‘-’
- The selector shall now move forward or backwards.

Click ‘→’ and enter a position
- The selector shall move to selected position

If not the selected component start, you must enter system layout and switch address with the component that actually starts. (See chapter 7.1.7)

Repeat for all components!
10  Silo/Doser settings

10.1  Silo refill

FIGURE 86

To refill silo click the silo icon.

FIGURE 87

Fill in amount refilled and feed type/size etc.

10.2  Manual calibration

When you first start the system it is not possible to know the calibration value. Therefore you have to make an initial calibration to have something to start with. Use this calibration as a start, then after e.g. 10-50 tons, use long term calibration to calibrate more accurate.

- Use manual feeding

Calibration: Always use approximately the same speed used when feeding

Method 1 - Before start calibration:
(Without feed in your silo)
1. Fill e.g. 30 kg of feed into the silo.
2. Enter manual feeding (Chapter 13)
3. Select unit to feed in, speed, and continuous feeding
4. Start feeding
5. At the time no feed is leaving the doser, stop manual feeding immediately
6. Take note of the registered feed amount. (Amount can be found in site summary, manual feeding).
7. Enter the silo again
8. Click the ‘Manual calibration’ icon
9. Next page....
Method 2 - If you already have feed in your silo: (Requires 2 persons)
1. Enter manual feeding.
2. Select unit to feed in (An empty hole at the selector), speed and amount. (E.g. 30 kg)
3. 1 person must hold a bag at the outlet chosen to collect the feed.
4. Start feeding
5. The software stops when it calculates 30 kg.
6. Take a weight sample of the collected feed.
7. Enter the silo again
8. Click the ‘Manual calibration’ icon

Follow next steps after using method 1 or 2:
9. Calculated feed amount: The amount the software calculated (Site summary, manual feeding)
   Actual feed amount: What you filled into the silo. (Collected in the bag if you used method 2 described)
10. Click ‘ok’ to accept the new value.

Repeat step 1-10 two more times for more accurate calibration.

Note!
When silo has run empty for the first time: Use long term calibration. The software automatically calculates the new calibration value.
Remember to re-calibrate when changing pellet size!
10.3 Long term calibration

After using the system for a while, you can use this long term calibration tool to calibrate the doser more accurately. The manual calibration is usually done using a small amount of feed. The long term calibration is usually used using a very large amount of feed. (10-50 tons or more) the dosing has been performed using normal feeding rather than a constructed test procedure. These factors make the long term calibration far more accurate than the initial manual calibration.

FIGURE 91

10.4 Reset long term calibration

When chosen, the silo amount will be reset (set to 0 kg) and the amount out of the silo will be reset (set to 0 kg). This is used if the into silo and out of silo seems to be out of sync and it is not caused by the calibration. This happens if e.g. some silo refills are forgotten.

To access:
<Click on a silo in site overview>

Choose long term calibration

You will get a question of how much is left in the silo. Instead of using this calibration method before silo is empty (where you have to guess the amount that is left in the silo), use this when silo is empty.

The software automatically calculates the dosers’ new calibration value.

<Click the reset long term calibration icon>
11 Prepare system for feeding

11.1 Add units to groups

- Each group will have its own meal set-up
- If all units within the same feed line shall be fed more or less the same, place all units in the same feed line in one group
- If you wish to treat units within the same feed line differently, it can be useful to place them in different groups
- As an example I will have two different groups in feed line 1

Since I have been using the 'system layout wizard' here, groups and feed line are the same.
- To add a new group click ‘+’
- Enter new group name
- Place e.g. unit 01 and 02 in group E from the scroll bar.

To remove a group, click ‘-’ button and select a group to remove

Like this.
- Feed line 1 now consists of 2 feeding groups.
- Feed line 2 through 4 have 1 feeding group each.
- I will now show how to make the feeding groups ready for feeding.
11.2 Choose feeding strategy

Attendance feeding:
‘This is feeding of one unit at a time to satiation’.
In other words, we dedicate the entire feed line capacity to one unit at a time, staying on that unit for the duration of a meal before moving on to the next unit. (Chapter 11.10)

When using this strategy, you must add meals to the preferred number of visits pr. unit:
- E.g.: 4 meals = 4 visits/unit/day

Cyclic feeding:
‘This is feeding of multiple units in a group in parallel by visiting them repeatedly in a cyclic pattern’.

When using this strategy, it is not necessary to have several meals. (Chapter 11.9)
11.3 Meals

When you have used the wizard for creating feed lines, the software will automatically assign a meal to each group. Since I manually created a group (group E), I have to add a meal manually in the meal set up.

- **<Right click on group 1/E>**

Set time for the meal to start

The meal will appear behind group 1/E in the meal planner.

The colour and the number in front of the group name indicate the feed line the group belongs to.

Group 1/E = Feed line 1, group E.

**To add more meals**: hold the mouse pointer at the preferred time you want the meal to start, and right click. Choose ‘Add meal’.

**To adjust the length of the meals**: place the mouse pointer at the end of a meal and drag.

**To move meals**: place the mouse on the middle of a meal and move

Since group A and E are in the same feed line, those groups cannot be fed at the same time. You must therefore set the meals in those groups to different times of the day

E.g. like this:
11.6 Amount in meals

<Right click on group A>

Drag the bars to decide the amount. (In percentage of the day total).

Make sure the spare is ‘0’

Repeat for group E.

The setup can look like this. Note that when a meal in one group finishes, the meal in the other group starts. This is because these groups are in the same feed line and cannot be fed at the same time.
11.7 Available time in meals

Setup 1

Note the two different setups.

Setup 1 has meals that are longer than the capacity estimate. This means that you have available time in the meal to handle an e.g. reduction in the feed rate.

You will also be able to start feeding between the capacity estimates.

Setup 2 has meals that have no available time. If you have a reduction in the feed rate here, you will most likely not be able to complete the meal. The system will stop feeding at the time the meal is set to stop.

You will neither be able to start feeding between the meals.

11.8 Yellow meal bar

If a meal bar is yellow, as shown here, this means that the meal is too short to feed all units in that group. To see the capacity estimate, simply drag the end to the right.

Like this.

The capacity estimate can also be seen if you click + in front of a group.
11.9 Cyclic feeding

This is feeding of multiple units in a group in parallel by visiting them repeatedly in a cyclic pattern. One of the purposes when using cyclic feeding is to feed the fish with many visits and relatively small doses throughout the day, it’s therefore recommended to have as few meals as possible. Remember to set the percentage to be fed in every meal (chapter 11.6).

There are also two different ways of angling the cyclic calculations. Both will be described here as:

Method 1 – Time between visits
Method 2 – Number of visits

Only use ONE of the methods described, do not mix them as this will change settings.

11.9.1 Cycle details

Available time:
This is the length of the meal you have created. To adjust this see chapter 11.5

Estimated time:
This is the time estimated with your current settings.

Visits:
This is the number of visits all units in that group will receive with your current settings.

Time between visits:
This is the time it takes from visiting a unit till the system comes back to the same unit again.

Transport time:
This is the sum of the transport times to all units in that group.

The circle:
This is the cycle whereas the dark blue colour is feeding 1 unit, light blue colour is transport time and the light colour is idle time pr cycle.

The line:
This shows the time estimate for the entire meal with the same colours as the circle. The white colour at the end is the free/available time that is left in the meal.
### 11.9.2 Cycle calculations

The calculations here are very basic:

- **Time between visits**
  - Transport time
  - Idle time per cycle

\[ \text{Feeding time per cycle} = \text{Time between visits} \]

So in order to be able to feed you need to have available feeding time for per cycle.

#### Note!
Feeding time is divided to all units in the group. If you have e.g. 4 units you need at least 12 seconds available feeding time (3 seconds pr. unit).

Time between visits need to be larger than the sum of transport time and idle time. If not, you will get a warning: **No feeding time available!** (FIGURE 113)

You will also be notified when you exceed the available time in the meal. (FIGURE 114) Time estimate is coloured yellow in this example where I have tried to set 400 visits. If you still insist to feed that number of visits, you therefore need to make the meal last longer. (Meal has to last for 12h 46min)

<table>
<thead>
<tr>
<th>FIGURE 112</th>
<th>Estimated capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Available time</strong></td>
<td>05:34:43</td>
</tr>
<tr>
<td><strong>Cycle planning</strong></td>
<td></td>
</tr>
<tr>
<td>Time between visits</td>
<td>00:01:08</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FIGURE 113</th>
<th>Estimated capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Available time</strong></td>
<td>05:34:44</td>
</tr>
<tr>
<td><strong>Cycle planning</strong></td>
<td></td>
</tr>
<tr>
<td>Time between visits</td>
<td>00:02:13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FIGURE 114</th>
<th>Estimated capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Available time</strong></td>
<td>05:34:44</td>
</tr>
<tr>
<td><strong>Cycle planning</strong></td>
<td></td>
</tr>
<tr>
<td>Time between visits</td>
<td>00:01:54</td>
</tr>
</tbody>
</table>
11.9.3 Method 1 – Time between visits

**FIGURE 115**

By using this setting you know how long time it will take from the system visiting a unit till it comes back to the same unit again. Any other adjustments that are done during feeding will not affect time between visits.

As you see from cycle details, **feeding time** is much larger than **transport time**.

**Number of visits** is relatively few. This is therefore a quite efficient way of doing cyclic feeding if you look at cycle details.

Idle time is set to 0. In order to make cycles and meals last longer you can add some idle time.

As you see from this picture I have added 1 minute idle time to each cycle. This means that after feeding 1 cycle the system will take a 1 minute pause before it starts the next cycle. This is indicated with the light blue colour in cycle details (circle) and time distribution (line).

**The feeding time pr. cycle** is divided to both units in that group.

Since they have multiple bars to decide feed rate, doses will vary through the meal. High feed rate -> big dose and vice versa.

Small doses     bigger doses           small dose

To have 1 dose through the entire meal, 1 bar to decide feed rate must be selected. Just click in the feed rate section and change no. of bars to 1.

**FIGURE 116**
11.9.4 Method 2 – Number of visits

These 2 buttons can help you with getting the desired number of visits and length of meal.

Set the number of visits to e.g. 150.

Note that time between visits is changed, idle time stays unchanged.

The software calculates time between visits in order to achieve the number of visits you put in.

As seen in cycle details feeding time and transport time are almost the same making this many visits a much less efficient way of cyclic feeding.

-----------------------------------------------

Note!
Do not edit idle or time between visits while focusing on number of visits as this will change this number!

If you still insist of making the cycles and meal last longer; Use the Set meal duration button. This will add idle time to each cycle without changing the number of visits.

-----------------------------------------------

Note!
If feed rate is changed during feeding, this will affect the number of visits. So decide which feed rate to use before calculating number of visits!

This happens because doses are decided from feed rate and visit time. So if feed rate is increased, doses are bigger and since total amount is unchanged, number of visits decreases.
11.9.5 Cyclic feeding – While feeding

FIGURE 120

Use + and – button while feeding to adjust feed rate.

------------------------------------------------------------------------------------------------------------------

Note!

When feed rate is increased, doses will be bigger since the unit will have the same visit time but with a higher speed, and vice versa!

------------------------------------------------------------------------------------------------------------------

Have in mind that if + and – button is used while feeding, you may finish feeding earlier/later according to capacity estimates. This is because number of visits will increase/decrease when higher/lower feed rate are used. This will not show in the capacity estimates.

FIGURE 121

If doses are very small, + and – button can also be used while clearing pipes. Changes will take place next visit on the cage that is adjusted.

FIGURE 122

If feeding is completed and the fish is still hungry there are several ways of feeding more:

- Adjust remaining amount in the units that you want to feed more.
  The cycles will continue as before but will feed the extra amount in the units where the remaining amount has been edited.

FIGURE 123
Increase daily amount:
By increasing daily amount in units the system will continue as before but will feed until the new daily amount is reached, if you have 1 meal.

If you have many meals you will only be able to feed the percentage of the new daily amount in the meal you currently are in.

E.g. you are in a meal that is 30% of daily amount. If you increase daily amount from 1000 to 1200 kg, you will feed 30% of 200 kg -> 60kg extra in this unit.

Add a supplementary meal:
Add a new meal after the last meal in your meal planner, and set it to be a supplementary meal.
Fill in requested amount in units you wish to feed more.
Cycles will continue as before until amount set here is fed.

See chapter 11.14 on Supplementary meal for more information
11.10 Attendance feeding

This is feeding at one unit at a time to satiation. In other words, we dedicate the entire feed line capacity to one unit at a time, staying on that unit for the duration of a meal before moving on to the next unit.

It’s normal to use from 1-10 meals if you use this strategy. Increasing the amount of meals to 20 and more means you are moving towards cyclic feeding.

I will now show how to set up attendance feeding with 4 meals in Group 4.

Choose group settings → Attendance feeding
Add new meals:
Place the mouse at the desired time you want the different meals to start, right click and choose add meal.

Percentage in each meal:
<Right click on the line 4/D \Group settings>

Drag the 100% bar down to the percentage you want to feed in the meal.
Drag the other bars to the desired percentage.

E.g. like this.
Make sure the spare is 0
All the meals will have the selected percentage inside them. The colour yellow means that the meal is shorter than the time estimate used for feeding all units in that group. To see the time estimate, simply place the mouse at the end of a meal and drag towards right.

The time estimate will appear within the bars with a dark blue colour.

To edit the length of the meals, feed amount and/or feed rate in all units within the group can be edited.

<Click + in front of the line> → choose units and click in the feed rate section.

You can also get access to this menu in site overview by right clicking on a unit and choosing feeding settings.

Adjust height of the bar(s) to edit speed during meal.
11.11 Immediately follow previous meal

<Right click on a meal and choose meal settings> gives you access to a textbox with some functions.

Immediately follow previous meal:
This function will start the next meal immediately after the previous meal has ended. This will be indicated with a line between the meals. By using this function you will most likely finish your feed plan earlier than indicated in the meal planner.

11.12 Always complete meals

Always complete meals:
This function will always complete the meal even if allocated time is exceeded. Be aware that by using this function you may get a delay in the feed plan.

11.13 Reduce feed rate in meals

Reduce feed rate in meals:
This function reduces your feed rate settings in that specific meal for all units in that group. If it's set to 50%, the units in that group will be fed with half the feed rate.
11.14 Supplementary meal
This meal is meant to be used if the fish is not satiated from the amount fed that day in your feed plan. It can only be set to start behind the last meal in the meal planner.

The amount set in this meal will not show in the site summary as kg/day in settings, but it will be added to kg/day when meal is finished.

To set up:
<Right click on a group>, choose 'Add meal'.

Set the meal to be a supplementary meal.

The meal will appear with black colour behind the last meal in that group.
<Right click on the meal you have added and choose ‘Set supplementary feeding’>

All units in that group will appear in the text box. If you mark the units they will be added the default value which is set to 10% of daily amount. By clicking + or -, you can edit till you get the desired amount you want to feed.

If the meal is yellow, just drag the end to see the time estimate. Or right click → meal settings and see the time estimate.

These settings will be cleared when the meal is fed. If the fish still is not satiated, new supplementary settings can now be set. If you wish to feed even more, be sure that you still are in the meal (AkvaControl timeline is in the meal bar) and that the length of the meal is long enough to finish the new amount set.
12 Use of the system

**Start automatic feeding:**
The button 🔄 will start automatic feeding in that feed line you choose.

**Move to next unit:**
If you press the same button again 🔄 while feeding, the system will move to the next unit in that feed line.

Use + and – button to increase/decrease feed rate while feeding

**Pause automatic feeding:**
Feeding can also be paused by clicking 🔄 once while feeding.

If you start feeding again 🔄 the feeding will start at the same place as where it was paused.

**Stop automatic feeding:**
Click the 🔄 button twice while feeding.

---

**Note!**
If you hold your mouse pointer at a button, a text will pop up with explanation of what happens if button is pressed.

---

If you press the Feeding text at top of your screen, you will get access to some functions regarding feeding.

Use these commands to start/stop/pause etc. ALL feed lines at the same time.

**See chapter 17 for more explanation.**
12.1 Monitoring feeding

12.1.1 Site overview

This shows the status of the unit currently being fed in this feed line.

Feed rate can be directly adjusted while feeding. Use the buttons

```
Feed rate 0.473 kg/ton/min
```

12.1.2 Meal planner

The dark blue colour inside each meal is the time estimated for the system to use on each meal.

The symbol indicates how far in the meal you have come.

The percentage inside every meal represents the amount (of the days total) to be fed in each meal.
The left section is your current settings (No. of fish, avg. weight, amount to be fed etc.) while the right section is the status so far today. You can group by feed line or by group if you wish.
12.2 Temporarily stopped

If you e.g. want to stop feeding for a period of time to conduct work on a unit, it might be necessary to temporarily stop feeding there for a while.

This unit will not be fed as long as it is on temporarily stop, but the unit will be in the feed plan waiting to get status 'feeding allowed'.

If you use cyclic feeding; activating this function will not affect the cycles of the other units in the same feeding group. The system will pause when this unit was supposed to be fed. This will not affect the time estimate.

If you use attendance feeding; activating this function will cause the system to finish the meal earlier because it skips this unit. But this will not affect time estimate.

12.3 Fasting – Disable feeding

If you totally want to exclude the unit from your feed plan and time estimate, fasting can be used. E.g. if you set the unit on fasting, waiting to be harvested.
13 Manual feeding

You may also use an AkvaMarina feeding system for completely manual operation, where you choose unit rate and feed amount manually. This may be of interest where you use camera or AkvaSensor Doppler to satiate the fish, or when you use AkvaRemotePC or some other remote control.

To access:

Choose the ‘hand’ icon

You must choose:

- Which feed line
- Unit
- Speed while feeding
- Continuous or Fixed amount

Continuous:
By choosing this method, the system will feed continuously till it reaches 3% of the biomass in that unit. This is a safety limit.

Fixed amount:
Here you can set the amount you want to feed. The system will feed till it reaches the amount set unless you stop it.

Clean pipes:
This function allows you to blow air in a selected unit with a set blower speed. This is useful for cleaning pipes. You can feed as usual in the other feed lines without stopping them.

Feeding can be monitored in the progress bar.

Manual feeding can also be done from the Site overview, just click the hand icon to activate. Select unit and speed and start feeding.
14Axis adjustment

14.1 Feed rate progress bar

**Feed line display** setting defines how long period of time to display on the progress) in the status panel for each feed line. This progress bar will scroll during the day to show the last 6 minutes (editable). The height of the progress line indicates the feed rate.

If you don’t edit the height of the axis, the feed rate axis will adapt the feed rate being used and will always appear at the top of the axis.

To edit these settings: Right click on the feed line and choose display settings.

It can be useful to have the maximum height a bit higher than the maximum feed rate used for those units in that feed line.
14.2 Feed rate

Right click on a unit, choose feeding settings.

With these settings maximum height is 30 kg/min.

14.2.1 VariDoser

There are two ways of adjusting the axes:
1. If you have a VariDoser
2. If you have a PulseDoser

Click on a silo in site overview
Choose advanced unit settings.

1. VariDoser

Max rate profile axis value is here set to 500 g/s.
If you feed at a low feed rate (small fish), it can be useful to set the limit lower e.g. 200 g/s.
This will give you a maximum height of the bar to 200g x 60 = 12 kg/min.
Low feed rate mode. Maximum feed rate allowed here is 12 kg/min. Value set to 200 g/s.

If you feed bigger fish with higher feed rates, set the value to e.g. 1500 g/s.

High feed rate mode. Maximum height here is 90 kg/min. Value set to 1500 g/s.

Note the resolution of the axis. Both examples show the same feed rate.
2. PulseDoser

If you have a pulse doser, the axis will follow the calibration value on the doser.

Like here: 1500 g/s x 60 = 90/kg/min
15 Analyze your data

15.1 Site report – current data

The report shows details on all units, everything fed today up until the button is pressed.

Details are:

- Unit Name, Fish Group, Number of fish in unit, Average Weight, Biomass, Feeding adjustment,
- Number of feeding a day and how many are remaining, what silo each unit uses, the amount fed automatically, manually and additionally, the total fed today, total accumulated and the temperature measured on the sensor connected to each unit.

15.2 Site report – historical data

This is the same as the previous report, but here you can select date from a list.

15.3 Note report

A note report is a printout of the notes made on each unit.

You can select all notes ever written or a limited selection

To write notes: Right click on the unit you want to write a note on:
15.4 Mortality report

A mortality report is a printout of the mortality registered. You may choose a printout for all units, one fish group, individual units, notes from all dates, a limited period, etc.

To register mortality: Right click on the unit you register mortality on.

15.5 Unit/fish group report

A unit/fish group report allows you to predefine your own reports to contain a selection of available data. You may assign these reports their own names so that you don’t have to make the same choices every time you need to print out the report. To do this, type a name where indicated by the arrow in the FIGURE and click save selection.

Next time, select the name from the drop down list.

Selection may be at the unit or the group level.

15.6 Silo refill history

Silo refill history:
This report gives you the opportunity to see all silo refills on the silo you select. Time period can also be selected.
This report shows you all maintenance registered on every component. Time period can be selected.

### 15.8 Feeding patterns graph

**Feed rates:**

Here you can analyze your feeding pattern in a 3D way:

- Feed rate used while feeding (semi transparent)
- Number of meals
- Start and stop time for every meal

Select unit and time period you want to display.

Scroll back and forth to familiarize yourself with the technical use of the log.
Feed amounts:
This view shows you the amount fed in every meal including start and stop time for every meal.
Select unit and time period you want to display.

Sensor margins:
This shows the meals during the time period selected. The yellow bars are meal broken off before the Sensor margin limit (%) setting. This means the meals are stopped too early. The blue bars indicate meal stopped within the Sensor margin limit (%). The white squares indicate meal completed. The height of the bars indicates how much was left of the planned feed amount.
Select unit and time period you want to display.
Include calculated amounts:
This shows the meals during the time period selected. The bars indicate how much feed has been fed, relative to the other meals. The blue T on top of the bars indicates the calculated size of the meal. Since the blue T is showing, the meal has stopped before completion. The bars without the blue T are meals that did complete.

Select unit and time period you want to display.
15.9 Unit/fish group graph

This graph is excellent if you want to compare feeding and environmental data. Select the unit, sensor data and time period you want to see.

Use this graph to analyze periods where you suspect environmental changes is one explanation to the fish appetite.

Like shown in this example, low temperature (the green line) can be the reason for the three days with less amount fed than the last three days.

You can also see here that a lot of current this day cause the temperature and oxygen level to rise.
15.10 Feeding control graph

To access, click here, or right click on a unit and choose Feeding control graph.

- View live/historic feedings in the same graph as the environment sensors.
- Customizable graph – You decide which data you want to see.
- Overlapping/non-overlapping axes.
- Automatic axis handling.
- Easy zooming/panning with the mouse. Get an overview of months of feeding or zoom in to the details of the last half hour.
When zoomed in you can analyze the feed rate of the meal you zoomed down to 1 minute. Environmental data are in the graphs above.

This is useful for analyzing feed rate at the start and end of each meal. Unit by unit and meal by meal can be compared. This is important when it comes to consistency in feeding.

You can select date and unit from the scroll down lists.

**15.11 Feed line utilization graph**

This graph shows all the feedings that have occurred in all the units belonging to a feed line.

With a quick glance at this graph you will see how much spare capacity you have in a particular feed line.

Deselect the units you are not interested in.

You have the same zooming facilities as the Feeding Control Graph.
15.12 Component error log

To get access:
<Help -> troubleshooting-> Machinery error log>

This allows you to see all errors reported from components in the feeding system.

Group error by component, error or combine those two.
You can export data to all programs that support the so called Norwegian Standard (NS) 9403 for exchange of data between the feeding system and other programs.

By using this feature you will create a file in a specified location that contains the data for all units.

You can also export feeding amount and mortality directly to Superior Control.
All feed lines – Set feeding on schedule
Sets feeding in accordance to the time/meal you are right now.

All feed lines – Set feeding=Day start
This function sets daily amount to the same as it was when the day started in all feed lines. If you have only 1 meal per day (100% of daily amount) this function is useful. The system will try to feed daily amount once more as long as you have enough time left in your meal.

If you have several meals and missed one of them, you will not be able to feed the amount in percentage that is in the meal you missed.

All feed lines – Set feeding=Day end
This will set the remaining amount in all units = 0. This function might be useful if you want to stop feeding in all units before the meals are completed and you want feeding to start automatically next day.

All feed lines – Move remaining feed amount to remaining meals
If you have, for some reason, missed a meal, this function will give you the opportunity to feed the total amount for that day by moving remaining amount to the remaining meals.

All feed lines – Set supplementary feeding
This function allows you to set supplementary feeding in all units.

Note!
A supplementary meal must be created in all feeding groups before using this function.

Feeding intensity all units
If you want to increase/decrease the daily amount in all units at the same time, this function can be used.

Note!
If you set this to e.g. 1.1, all units will increase the daily amount by 10%.
18 Alarm Output settings

- Alarm outputs in the main cabinet may be connected to external lights, sirens or SMS transmitters.

- You may be notified of feeding stops, equipment failures and excessive temperature, current and oxygen readings.

- If an alarm is triggered, this will be indicated below the clock (bottom right corner) in AkvaControl.

FIGURE 193
Component settings Help
Edit all system components
Alarm output settings
Feed line 1

FIGURE 194
Enable alarm outputs
- Feeding stopped due to machinery error
- Emergency stop
- Equipment failure, check breaker switch/relay/frequency controller/fan beta etc (See Exception log for details)
- Low oxygen level, check sensor readings and alarm levels
- High current, check sensor readings and alarm levels
- High temperature, check sensor readings and alarm levels
- An alarm is active (AHV alarm)

Note that you should investigate the real reason for an alarm before you clear it. If the cause of the alarm has not been sorted out, the alarm may be triggered again.

Clear active alarms
OK Cancel

15.11.2007 - 09:33
Check alarms!
19 Copy settings to other units

If you change a setting in one unit; E.g. blower speed, and you want to use the new setting in other units, this function allows you to copy this setting to other units.

To get access: <Right click on the unit> (in site overview) you wish to copy from. Choose copy settings to other units.

Mark the setting(s) you want to copy, and select the units you wish to copy to.

<Click copy>

Note! ‘Copy all’ will copy all settings on the list from the unit you are in to the units you select.
20 Failure reporting

20.1 Export AkvaControl system setup to a file

If there is a problem at your farm you can send two small files containing all the settings. The service technician may quickly load the same system state into his own system and check your settings.

To get access:
<Help -> Troubleshooting -> Export AkvaControl system setup to a file>

You can edit the name of the file so you easily recognize it when you attach the file to a mail. E.g. Blowerfailure.CCS

The default destination folder is your AkvaControl CCS directory. Change it if you want.
20.2 Import AkvaControl system setup from a file

To find the file just look in the AkvaControl CCS folder for 4 files named: Blower failure.
These files can be sent to a Service technician.

You can also import a file which is edited by a Service Technician.

Note!
If you import a file, all data registered from the time you exported the file till you import it, will be overwritten!

There is only 1 file to select, make sure you choose the correct file.
These settings are usually set only at the first start-up and when starting at a new location.

**Date/Time**
Set the time on the CCS manually or use the PC->CCS button. This will give the CCS the same time as the PC. This is the time that is indicated in the bottom right corner in AkvaControl.

**Feeding day**
You can select the sunrise/sunset either manually or automatically within AkvaControl.

---

**Note!**
*When using automatic settings, you have to insert some geographical information. This is done in the Site/registration information*

---

**Position units**
Position your units in site overview like you prefer.
**Site/registration information**
Fill in the geographical information if you want to use automatically sunrise/sunset calculation.

**Program registration**
These settings will be sent to you by AKVA group.

**Automatic events**
Select printout of daily report and/or automatic export data to file.

**FishTalk connection**
AkvaControl and FishTalk are fully integrated.

- Changes in the number of fish and average weight are automatically transferred from FishTalk to AkvaControl
- Daily summaries of feed amounts are automatically transferred from AkvaControl to FishTalk
- All logging data produced by AkvaControl are available for reporting and graphs in FishTalk
Customize display

Panel size:
Choose size of bottom panel

Automatic unit popup:
If you drag your mouse pointer to a unit in site overview, choose if you like popup of unit status to show automatically or by pressing CTRL key while pointing at a unit.

Size of feed line status section:
This is the upper section on your screen where all your units are placed. Choose if you want to edit this size.

Language:
When new language is chosen, program may need to be restarted for changes to take effect.
22 Backup functions

A backup copy is a copy of all data applicable to the preceding day's feeding. I.e. all values you have access to in the AkvaControl-program, for example the number of fish, average weight, feed output amount, mortality, temperature, etc. All "fixed" settings, such as feeding profiles, meal profiles, transport times, calibration values, etc. are also included in this backup copy.

Each midnight the system gathers a backup copy from the feeding computer and stores it automatically on the hard disk of your PC. When a generator is used as the power source, this will take place as soon as you turn on your PC the following morning.

**Purpose:**

- To safeguard the data in case of lightening strike or other events that may cause the feeding computer to lose all entered data.
- Access to old data in the event of having to replace feeding computer.
- To enable output of historical data.

**FIGURE 210**

![Save AkvaControl system setup](#)

This function takes a backup of all feeding data stored on your CCS. The program automatically takes a backup every midnight.
**FIGURE 211**

<table>
<thead>
<tr>
<th>Backup</th>
<th>Feeding settings</th>
<th>Site settings</th>
<th>Comp</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Save AkvaControl system setup</td>
<td>Restore AkvaControl system setup</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create an external backup of all logs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Restore AkvaControl system setup**
This function restores any previous backups made. Choose date from the list that appears.

**FIGURE 212**

<table>
<thead>
<tr>
<th>Backup</th>
<th>Feeding settings</th>
<th>Site settings</th>
<th>Comp</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Save AkvaControl system setup</td>
<td>Restore AkvaControl system setup</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create an external backup of all logs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Create an external backup of all logs**
To prevent loss of data if your PC should fail, it is necessary to store the backup copies on a USB memory stick. This does not take place automatically, so establish a routine to ensure that you do it once a week.

This backup is a complete backup which you can restore on any machine where AkvaControl is installed.
23 Feeding settings

23.1 Feed rate mode

You can select several ways of viewing the feed rate; you can select three methods at the same time. One scale is on the left side, one scale is on the right side and there is a scale with the numbers on the bars directly. The mode for this is in the headline of the frame.

**Feed rate update mode**
This is the value on top of the bars in the feed rate profile and speed while feeding.

**Meal profile display (left/right axis)**
This is the value on the axis of the meal profile
23.2 Feed tables

If you want to calculate the daily amount from a feed table, click the icon 'Read table from file'.

- You can use the feed tables that are your AkvaControlCCS folder.
- Give a name to the table.
- The table values can be edited directly in AkvaControl. (Just click in the grid to edit the number)
- You can import any feed table as long as the file format is .tab.
- If you use a manual temperature sensor, remember to enter a value so that the system can read from the temperature table.
- Remember to refer to a feed table in feed calculation method (Chapter 8.4)

Note!
When feed table is chosen, AkvaControl sometimes need to be restarted for changes to take affect

Feed tables

<table>
<thead>
<tr>
<th>Temperature °C</th>
<th>0</th>
<th>30</th>
<th>100</th>
<th>300</th>
<th>500</th>
<th>1100</th>
<th>3000</th>
<th>5250</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>1</td>
<td>0.55</td>
<td>0.34</td>
<td>0.27</td>
<td>0.23</td>
<td>0.19</td>
<td>0.13</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.38</td>
<td>0.18</td>
<td>0.09</td>
<td>0.06</td>
<td>0.04</td>
<td>0.03</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.29</td>
<td>0.09</td>
<td>0.04</td>
<td>0.02</td>
<td>0.01</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.24</td>
<td>0.04</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.11</td>
<td>0.01</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0.07</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>0.30</td>
<td>0.18</td>
<td>0.13</td>
<td>0.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0.14</td>
<td>0.08</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>0.07</td>
<td>0.03</td>
<td>0.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0.04</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>0.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
23.3 Feeding groups

FIGURE 218

Feeding settings  Site setting
Feed rate mode
Feed tables

Feeding groups

FIGURE 219

Feeding groups

- Each group will have its own meal set-up
- If all units within the same feed line shall be fed more or less the same, place all units in the same feed line in one group
- If you wish to treat units within the same feed line differently, it can be useful to place them in different groups

<Click + >to add a new group. Select which group the different units shall belong to.

<Click - >to delete a group.

Note!
Units in different feed lines cannot be placed in the same group.
24  Editing the system overview – background picture

The background picture has been created in MS Paint and may be changed to resemble your own location. The background picture used is called \texttt{Akva.bmp} and is located in \texttt{C:/AkvaControlCCS/bitmaps} This picture may be edited with MS Paint and stored with the same name. The next time AkvaControl is started it will be with the new background picture. The system is delivered with different pictures that may be used as a starting point for creating your own background picture. It is important to remember however, that it is the picture with the file name \texttt{Akva.bmp} that will be used.

\textbf{FIGURE 220}
25 Utility programs

There are 4 utility programs in your AkvaControl CCS folder. 3 of these are not meant for daily usage:

1. AkvaAdm32
2. AkvaControlConvertDatabase
3. Ccs2Upgrade
   Basically the service technician will use these 3 programs for upgrading, backup recovering or troubleshooting. If these programs are used without approval of the Akvasmart department, we will not take responsibility for the loss of data that can occur.

4. AkvaNodeMonitor can be used without the risk of losing data

25.1 AkvaAdm32

25.1.1 Database Administration
AkvaControl must be closed before opening this program. This allows you to look into all data registered in AkvaControl:
- Every feeding (amount, start/stop time etc.) taken place.
- All errors on components registered.
- All sensor readings.
- All events (Calibrations, refills etc.) on silo/dosers registered.
- Machinery maintenance.
- Feeding computer backups.

All columns can be grouped for easier analyzing.
25.1.2 **Restore system backup**

Any external backups in AkvaControl can be restored here. By doing this all data will be overwritten.

![Figure 222](image)

25.1.3 **Communication settings**

This gives you an overview of the communication settings to the CCS2 (feeding computer) and Remote controls.

![Figure 223](image)
25.2 AkvaControlConvertDatabase

This program is only to be used by a service technician. A normal database conversion will be done from an installation CD.

This is to be done when upgrading from V9 to V10 and you want old data to be available in the new version.

The software automatically detects the data in your AkvaControl CCS folder from V9 (If not removed), and converts it into your V10 folder.

FIGURE 224

This is best to do overnight, because sensor- and feeding log can contain a lot of data which takes a long time to convert.

If you still wish to convert data fast, just unmark the largest fields for later converting.
25.3 CCS2 Upgrade

This program is only to be used by a service technician. A normal upgrade will be done from an installation CD.

AkvaControl must be closed before opening this program. This program will upgrade your CCS2 (feeding computer). This may have to be done if bugs in the program are detected and repaired, or new features added.

Procedure:
- Save AkvaControl system setup. Name the backup with e.g.: Before upgrade (Today’s date)
- Close AkvaControl
- Rename your Ccs2Main.run file to e.g.: CcsMain(Date of the file).run
- Paste the new Ccs2Main.run file in your AkvaControl CCS folder

When CCS2Upgrade icon is clicked, the software automatically detects your new program version file. Your feeding computer (CCS2) will now get the correct version.

When upgrade is completed, wait 20 seconds before starting AkvaControl.
- Restore the backup you saved before you upgraded
25.4 AkvaNodeMonitor

This program allows you to monitor the signals of all units in your system: Blowers, dosers, selectors that are connected to your k-net. Wireless signals from CSU’s are also monitored.

This makes it easy to troubleshoot if you have problems with e.g. video transmission signals from a CSU in a unit.

Columns can be grouped for easier troubleshooting.

FIGURE 226

All the units connected to your system with ADIO address, channel, ID, application type etc.

Status of your signals and dropouts

Events
### 25.4.1 Use of the program

#### FIGURE 227

The blue bar with number 1 on top indicates the number of dropouts on that specific ADIO address.

#### FIGURE 228

The ADIO address with a lost signal shows which application type it is with ID and no. of dropouts.

This section shows date and time of when signals are lost.

#### FIGURE 229

When coloured green signals are detected again.

<table>
<thead>
<tr>
<th>ADOI ID</th>
<th>Channel</th>
<th>ID</th>
<th>Application Type</th>
<th>Dropouts</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>11995914000000001</td>
<td>0</td>
<td>2</td>
<td>CSU</td>
<td>1</td>
<td>Lost</td>
</tr>
<tr>
<td>11995914000000002</td>
<td>0</td>
<td>2</td>
<td>CSU</td>
<td>0</td>
<td>OK</td>
</tr>
<tr>
<td>11995914000000003</td>
<td>0</td>
<td>1</td>
<td>CSU</td>
<td>0</td>
<td>OK</td>
</tr>
<tr>
<td>11995914000000004</td>
<td>0</td>
<td>3</td>
<td>CSU</td>
<td>0</td>
<td>OK</td>
</tr>
<tr>
<td>11995914000000005</td>
<td>0</td>
<td>1</td>
<td>Main</td>
<td>0</td>
<td>OK</td>
</tr>
<tr>
<td>11995914000000006</td>
<td>0</td>
<td>1</td>
<td>Selector</td>
<td>0</td>
<td>OK</td>
</tr>
<tr>
<td>11995914000000007</td>
<td>0</td>
<td>2</td>
<td>DOA</td>
<td>0</td>
<td>OK</td>
</tr>
<tr>
<td>11995914000000008</td>
<td>0</td>
<td>1</td>
<td>Selector</td>
<td>0</td>
<td>OK</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Channel</th>
<th>ID</th>
<th>Application Type</th>
<th>ID</th>
<th>Dropouts</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.12.07</td>
<td>09:19:29</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A66</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:19:43</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A67</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:19:52</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A68</td>
<td>Read on in</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:19:53</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A69</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:19:56</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A6A</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:19:58</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A6B</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:20:04</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A6C</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:20:08</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A6D</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:20:10</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A6E</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:20:12</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A6F</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:20:13</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A70</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:20:18</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A71</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:20:20</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A72</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:20:22</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A73</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:20:31</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A74</td>
<td>Set dip. out.</td>
</tr>
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<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Channel</th>
<th>ID</th>
<th>Application Type</th>
<th>ID</th>
<th>Dropouts</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.12.07</td>
<td>09:20:04</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A75</td>
<td>Set dip. out.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Channel</th>
<th>ID</th>
<th>Application Type</th>
<th>ID</th>
<th>Dropouts</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.12.07</td>
<td>09:21:12</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A76</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:21:15</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A77</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:21:22</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A78</td>
<td>Read in in</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:21:24</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A79</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:21:34</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A7A</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:21:54</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A7B</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:21:56</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A7C</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:21:58</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A7D</td>
<td>Set dip. out.</td>
</tr>
<tr>
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<td>09:21:59</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A7E</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:21:59</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A7F</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:21:59</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A80</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:21:44</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A81</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:21:46</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A82</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:21:52</td>
<td>0</td>
<td>1</td>
<td>Telo OK</td>
<td></td>
<td>1A83</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:22:02</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A84</td>
<td>Set dip. out.</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:22:04</td>
<td>0</td>
<td>4</td>
<td>Get node ID</td>
<td></td>
<td>1A85</td>
<td>Read ID</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:22:06</td>
<td>0</td>
<td>4</td>
<td>Get node ID</td>
<td></td>
<td>1A86</td>
<td>Version</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:22:06</td>
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<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A87</td>
<td>Version</td>
</tr>
<tr>
<td>09.12.07</td>
<td>09:22:06</td>
<td>0</td>
<td>2</td>
<td>Telo OK</td>
<td></td>
<td>1A88</td>
<td>Version</td>
</tr>
</tbody>
</table>
Grouping can make the troubleshooting easier if you e.g. want to search by ID. Drag the ID section on top like shown here.

FIGURE 230

Try to find patterns on:
- Which ID drops out
- When the dropouts occurred
- Number of dropouts

### 25.4.2 Failure reporting

Logs can be saved to a file and sent to AKVA group ASA for troubleshooting. In this way the service technician can download the file to his system instead of the customer trying to explain the problems.

FIGURE 231

Notice the destination of the saved file.

FIGURE 232
26 System usage recommendations

Components such as: Dosers and blowers are run by engines. In order to avoid damages on the engines there are some limits in the settings that need to be set. I will also show a graph which describes the maximum recommended feed rate (On the different feeding systems) in different distances from selector to units. Minimum doses for VariDoser and PulseDoser will be described as well.

26.1 Blowers

FIGURE 233

Speed while feeding must be between 40-100%

100% speed equals 60Hz

40% speed equals approx. 20 Hz, which is the lowest speed the engine can handle.

26.2 Pulse doser

FIGURE 234

Speed while pulsing must be between 40-100%

Pulse ON time must not be lower than 0.5s

Minimum pulse OFF time must not be under 0.5s

There is no upper limit for pulse on/off time

Note!
If these settings are edited, the doser needs to be re-calibrated!
26.3 Selector

The selector settings are only to be edited by a service technician!

26.4 Maximum feed rate (g/s) in different distances

FIGURE 236
26.5 Minimum doses/feed rate

There are limits for how small doses you can feed by the use of VariDoser and PulseDoser. Feed rate can be as low as you wish.

26.5.1 VariDoser

The minimum dose the VariDoser can deliver depends on the feedback pulses pr. kg value. Calculation:

\[
\text{Calculation:} \quad \frac{2000}{\text{pulses/kg}}
\]

Example:

\[
\frac{2000}{200} = 10\text{g}
\]

Fill in your calibration value and calculate.

---

Note!
When feeding very small doses, calibration value will most likely be inaccurate!
---

26.5.2 PulseDoser

The minimum dose on a PulseDoser depends on the calibration value of the doser. The doser needs a minimum on time of 0.2s.

Examples:

1. Calibration value= 200g/s
   200g/5=40g in 0.2 seconds

2. Calibration value= 1000g/s
   1000/5=200g in 0.2 seconds

3. Calibration value= 2000g/s
   2000/5=400g in 0.2 seconds

Just fill in the calibration value that you have on your PulseDoser and calculate the minimum dose.
27 Air monitoring

In order to avoid clogged pipes and pellet breakage we can monitor air speed and back pressure for optimal pellet transportation. Warnings and stop dosing are regulated by limits set by the user based on high/low pressure limits.

Note!

You need AkvaControl V 10.01m and CCS version 10.01.00.1141 or later, and Air monitor unit installed, to be able to use this functionality.

27.1 Enabling Air Monitoring

When the unit is installed, some settings in the software are necessary:

1. Edit system components

FIGURE 239

1. Click the blower symbol in the feed line the air monitor unit is installed

2. Mark the ‘Air monitor unit installed’ section (A) and select check if automatic stop of feeding is desired (B and C)

3. Adjust for how long the pressure should be in the red area before automatic stop (D)
4. **Right click on a cage in ‘Site overview’ → Advanced settings**

Adjust desired limits
27.2 Air speed adjustment wizard

<Right click in the feed line section>

FIGURE 242

Mark the cages you wish to set a target air velocity rate, and set rate. Use + and – buttons to change rate

FIGURE 243

<Click Start>
The wizard will go through every cage to find the target air velocity. Based on pipe lengths and blower type, the software calculates the new blower speed automatically when target is reached. Choose if you wish to use the new blower speed.

**FIGURE 244**

<table>
<thead>
<tr>
<th>Current settings</th>
<th>Target values</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

27.3 Reading the graph

- The graph limit section turns yellow (warning) when the graph is 0.05 bar from reaching pressure limits and 3m/s from reaching the velocity limits.
- It turns red (alarm) when reaching the limits and stays red until feeding is stopped and started again.

**FIGURE 245**

- When feeding starts and pressure/speed immediately reaches the limits, it takes 6 seconds before warning/alarm is activated. This is because we don’t want to trigger any false warnings/alarms.
27.4 Air monitoring history

By using the graph history you can find Hi/Low values on pressure and velocity to be set in each cage to give you warning/stop.

<Right click on a cage with Air Monitoring installed -> Feeding control graph>

Select date you want to analyze and enable: Transport air pressure, velocity and temperature from the list above the date.
Press left mouse button while dragging the mouse from left to right to zoom in, and from right to left to zoom out.

FIGURE 248

FIGURE 249
Change the scale on e.g. Air pressure by pressing the left mouse button while
dragging the mouse pointer from maximum to minimum value to change
resolution

FIGURE 250

This gives you the opportunity to see changes in e.g. air pressure when feed
rate changes

FIGURE 251
28 Adaptive feeding

This chapter will consistently refer to the general term Pellet sensor. The adaptive feeding described works for both Doppler sensors and IR sensors.

Adaptive feeding is automatic feeding by the use of pellet sensor whereas the system increases the feed rate if no/too weak pellet signal is received and reduces/stops feeding if too strong pellet signal is received. This means that the fish adjusts the feed rate, and tells the system when it’s satiated, itself. The Adaptive strategies and sensor limits are set by the user as there are too many variables:

- Type of pellet sensor
- Amount of fish in the cages
- Depth on nets
- Sea temperature
- Fish species etc.

28.1 Adaptive feeding strategies

![Add new strategy icon](Click add new strategy icon) to add a new strategy
Display name: Give a name to your strategy

Feeding attempts per day: How many times per day, after your pellet sensor has received a stop signal, do you want to retry feeding in that cage.

Decision interval: If you reach the ‘reduce feed rate’ line, the system needs some time to see how the new feed rate affects the pellet signal. You can calculate this if you know the sum of the following parameters:
  - Transport time (the time the pellet uses from the doser to the outlet of the pipe)
  - Pellet sinking time (from the surface till the pellets reaches the sensor)
  - AND the time needed for the sensor to measure the signals received by the use of the new feed rate.

Sleep time: If the pellet signals are strong and triggers ‘stop feeding’ in a cage. The sleep time decides how long it shall take before you retry feeding in a cage.

Ramp up: this increases the feed rate when no signals are received by the sensor:
  - Fast = 100% of current speed
  - Medium = 35%
  - Slow = 10%
  - None = 0

Ramp down: this decreases the feed rate when too strong signals are received by the sensor:
  - Fast = 50% of current speed
  - Medium = 26%
  - Slow = 9%
  - None = 0%
  - Stop = 100%

Note!
If maximum feed rate is less than 100% of initial feed rate, fast ramp up will be the same as maximum feed rate.

--------------------------------------------------------------------------------------------------
The strategy is divided into 3 sections. Different strategies can be used in each section. 

**The entire line (from 0-100) represents one meal in percentage amount. When a new meal starts, the strategy starts over again on 0.**

You can edit the length of each section by placing the mouse pointer in the sections and drag the ends.

**FIGURE 254**

![Diagram showing strategy sections and arrows]

**Section 1:** As shown it represents 15% of the entire meal. It might be useful to have a more aggressive ramp up strategy here since the fish most likely is hungrier at the start of a meal and therefore can eat at a higher feed rate.

Ramp down is almost never used in this section since we don't want any ‘false’ signals to trigger any reduction in feed rate this early in the meal.

**Section 2:** This is where most of the ration in the meal is fed. Variations in feed rate both up and down are normally more conservative.

**Section 3:** In this section the fish is getting close to satiation, therefore you might be more careful with ramp up, and rather focus on an aggressive ramp down strategy.

**The arrows:** The angle of the arrows indicates how aggressive you are on ramp up/down.

- **Green:** Ramp up strategy
- **Red:** Ramp down strategy
28.2 Adaptive settings

<Right click on a cage in site overview → Feeding settings>

**FIGURE 255**

![Image of adaptive setting interface]

**Initial feed rate:** The feed rate used when a meal starts

**Minimum feed rate:** The lowest feed rate that can be used when ramped down

**Maximum feed rate:** The highest feed rate that can be used when ramped up

**Low pellet sensor threshold:** This is a low pellet signal decision point. If the pellet signals are below this limit, adaptive strategy and settings in the section that you are in will decide what will happen to the feed rate.

**High pellet sensor threshold:** This is a high pellet signal decision point. If pellet signals hits this line, adaptive strategy and settings in the section that you are in will decide how much reduction you will have in the feed rate, you can even stop feeding.

**Feed amount per day:** To be able to feed, the system needs an expected amount. It might be useful to set the amount slightly more than you expect since the fish decides itself when it’s satiated. If no pellet signals have stopped feeding, feeding will stop when the amount set here is reached (Unless you have set an Adaptive margin, see next chapter).
28.3 Meal settings

Enter meal planner

FIGURE 256

<Right click on line 1/A → Group settings>

Enable Adaptive Feeding

FIGURE 258
Visit scheduling:

- **Attendance feeding:** This is the recommended feeding strategy when using adaptive feeding. Few visits per cage/day make the system work easier as a control loop.
- **Cyclic feeding:** In order for the system to work best in cyclic feeding, few, larger meals with few visits can be chosen, where the ‘time between visits’ parameter is set rather high.

**Adaptive margin:** Here you can add a percentage of the day total that you allow the system to feed in case the fish appetite is better than you expect.

**Reschedule feeding if there’s any spare time in the meal:**
If feeding has stopped due to high pellet signals, feeding may be rescheduled if you have more ‘Feeding attempts per day’. This will take place when ‘sleep time’ is finished.

**Limit feed amount in meals according to amount distribution**
By activating this function you will avoid that more than the percentage set in each meal will be fed.

### 28.4 While feeding

**FIGURE 259**

This shows where you are in the meal
And what section you are in the strategy

- The graph shows that the pellet signals is under the **Low pellet signal threshold**, and therefore there’s been a ramp up in feed rate 2 minutes (Decision interval) after feeding has started.

- Here the graph shows that the pellet signal is hitting the **High pellet signal threshold** and the feed rate is reduced.
The feed rate will stay the same for the next 2 minutes (Decision interval) to see how the new feed rate affects the pellet signal.

If you feed more than the percentage set in each meal, this will be indicated by extending the Adaptive Strategy bar more than 100 as seen on the picture below. The indicator will also turn yellow.

The indicator will turn red when exceeding 150% of the expected amount in the meal.

### 28.5 Pellet signal history

To see graph history on pellet signals, procedure is the same as the previous chapter: **27.4 Air monitoring history**

*Right click on a cage* > Choose *Feeding control graph* > select date

Remember to enable ‘Pellet signals’ and Low/High pellet signals threshold from the list above the date. Zoom in by pressing the left mouse button while dragging the mouse from left to right, and vice versa.
29 Frequently asked questions (FAQ)

This chapter will describe some of the problems that may occur during installation of AkvaControl and Microsoft SQL server.

29.1 Database server is not up and running

If the installation program indicates that AkvaControl V10 Database server is not up and running after step 1 and 2 is completed, it might be that you have a previous installation of AkvaControl V10. Even if this program is uninstalled, some data files stored in: 'Program files'\Microsoft SQL Server\MSSQL$????\Data and are named AkvaControlDBxxx.mdf and AkvaControlDBxxx.ldf, must be removed/renamed

29.2 SQL-server installation problem

If the SQL server installation gets a (X) instead of (V) while trying to install MSXML6 please do the following:

- The newest version of AC V10 has a file on: Distribusjonsfiler\AkvaControl\SQL Server 2005 Express Setup\Installation troubleshooting
- Go to: [http://support.microsoft.com/kb/290301](http://support.microsoft.com/kb/290301) and download ‘Windows installer utility’
- Start the program and choose MSXML from the list
- If the program does not find MSXML from the list
  - Open windows explorer
  - Choose Tools
  - Folder options
  - View
  - Mark: Show hidden files
  - Unmark: Hide protected operating system files and Use simple file sharing
- Read-only tab on files must be unmarked
29.3 Unable to run SQL-server after installation

If you have problems with running SQL-server service after installation is complete, please do the following:

1. Open My Computer.
2. Type C:\Documents and Settings\NetworkService\Application Data\Microsoft in the address bar, and then press ENTER.
3. Right-click the Protect folder, and then click Properties.
4. In the folder Properties dialog box, click the Security tab.
5. Under Group or user names, determine whether NETWORK SERVICE is listed. If NETWORK SERVICE is not listed, follow these steps to add this account:
   a. Click Add to show the Select Users or Groups dialog box.
   b. Click Locations, select your computer name in the Locations dialog box, and then click OK to return to the Select Users or Groups dialog box.
   c. Type Network Service in the Enter the object names to select box, and then click Check Names.
   d. Click OK to close the Select Users or Groups dialog box.
6. Click NETWORK SERVICE under Group or user names, and then click to select the Allow check box for Full Control under Permissions for NETWORK SERVICE.
7. Click OK to close the folder Properties dialog box.
8. Click Retry in the error message dialog box to continue to install SQL Server Express Edition or SQL Server Express Edition with Advanced Services.

http://support.microsoft.com/kb/920114