

BigFarmNet
manager

HydroMixpro

Code No. 99-97-3421 GB

Edition: 11/2016

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We are constantly working on further developing the computer and the software and also consider user preferences. Please let us know if you have ideas or suggestions for improvement and modification!

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1 System description

The **Big Dutchman** HydroMix system is a computer-controlled feeding system for the fully automatic feeding of sows, piglets and finishing pigs for any size of operation. It mixes together various liquid and solid feed components to form a pumpable mix (liquid feed) which is then distributed in weighed doses via feed valves in the pig house.

HydroMix is a modular system that can be used to realize multiple system concepts.

HydroMix is controlled by the HydroMixpro application with the BigFarmNet Manager software. The software allows configuring all necessary settings for the feeding process.

1.1 Requirements to install the HydroMixpro application

The HydroMixpro application uses the MC700 as control computer. The MC700 control computer controls a maximum of one HydroMix system. The number of control computers per network is not limited.



The MC700 control computer requests a password if the Manager computer and the MC700 control computer are restarted. The password is: 1

A restart may be necessary after a lock or a power failure.

The following software licenses are **required** to run the HydroMixpro application:

Code no.	BigFarmNet Manager license	Use
91-02-6596	MC700 BigFarmNet HydroMix	1 per MC700
91-02-6500	BigFarmNet Manager – Basic installation software	1 per BigFarmNet network

Additionally, a license for the Finishing Manager and/or the Sow Manager is **necessary**:

Code no.	BigFarmNet Manager license	Use
91-02-6559	BigFarmNet Manager – Finishing Manager	1 per BigFarmNet network
91-02-6555	BigFarmNet Manager – Sow Manager	1 per BigFarmNet network

The following software licenses are **optional**:

Code no.	BigFarmNet Manager license	Use
91-02-6551	BigFarmNet Manager per additional PC/MC700	In case animal and system data in the BigFarmNet Manager is to be available on additional computers
91-02-6558	BigFarmNet Manager – Sow management < 1000 sows	1 per BigFarmNet network
91-02-6566	BigFarmNet Manager – Sow management 1000 - 3000 sows	
91-02-6567	BigFarmNet Manager – Sow management > 3000 sows	
91-02-6564	BigFarmNet Manager – App Pig	Access via the user's smartphone or tablet


1.2 System limits

10,000	Sows
100,000	Finishing pigs
50	Feed circuits
1,200	Feed valves
20	Mineral dosing units / Medicators
100	Feed curves
100	Components (from HydroMix system)
50	Recipes
200	Feeding times
50	Eating timetables

2 Configuration of the system

2.1 Adding the control computer and the application

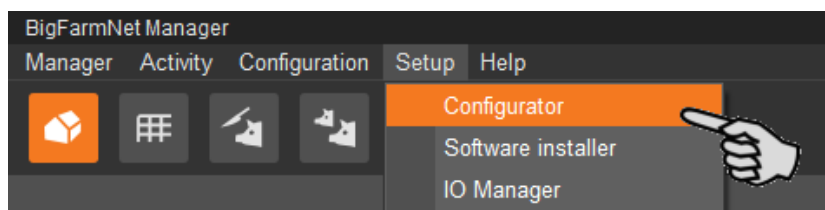
Before the system can be configured in accordance with the mechanical situation, the respective control computer and the application must be added to your farm system.

	<p>Do not use the Configurator to create the farm structure with houses, sections and pens for this system. The circuits and feed valves must be assigned to their corresponding location (house, section and pen) in the Composer, see chapter 2.2 "Configuring settings in the Composer", page 7, point 7. The farm structure is generated automatically as soon as the locations have been assigned in the Composer.</p>
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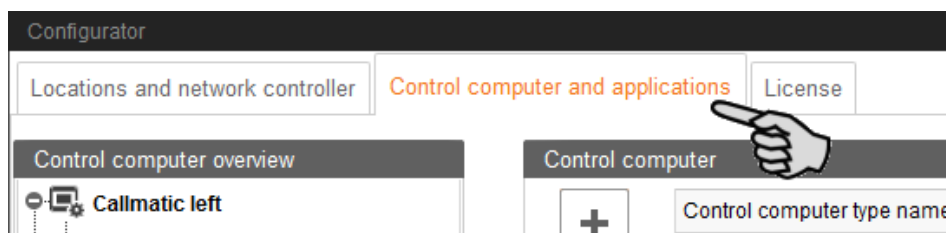
Proceed as follows:

1. Click on "Configurator" in the "Setup" menu.

This opens the "Configurator" window.

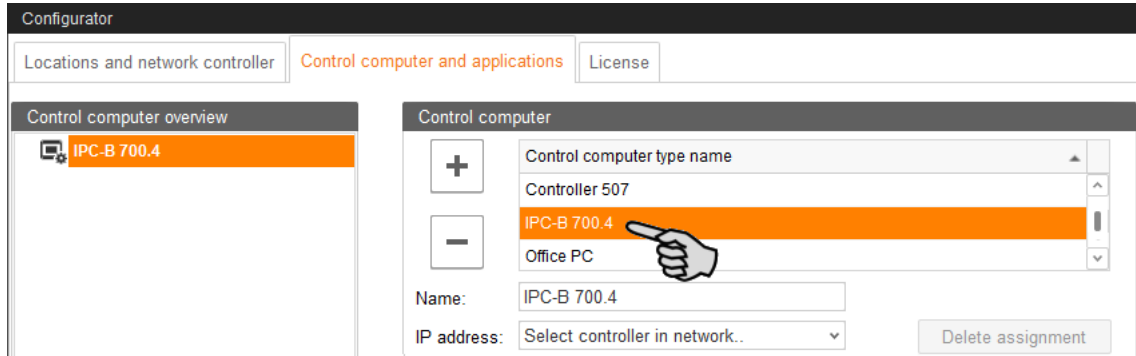


2. Click on the "Control computer and applications" tab.

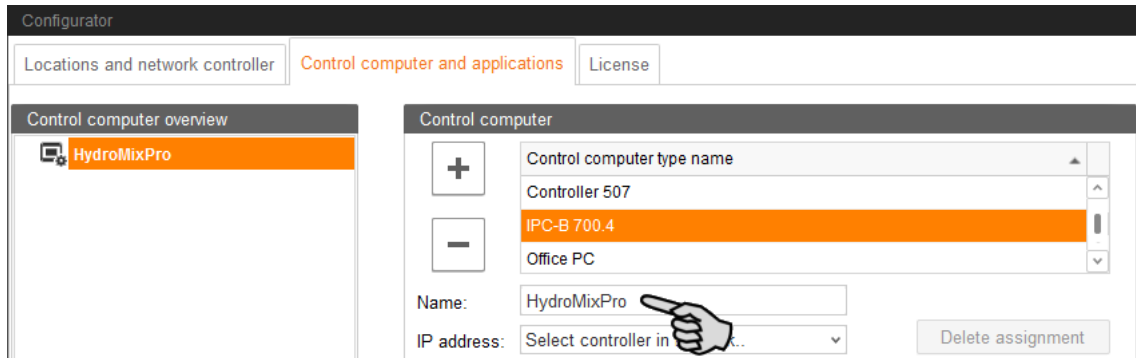


3. Select the correct control computer in the upper part of the window under "Control computer" and click on the plus button to the left.

The control computer is now added in the left-hand part under "Control computer overview".



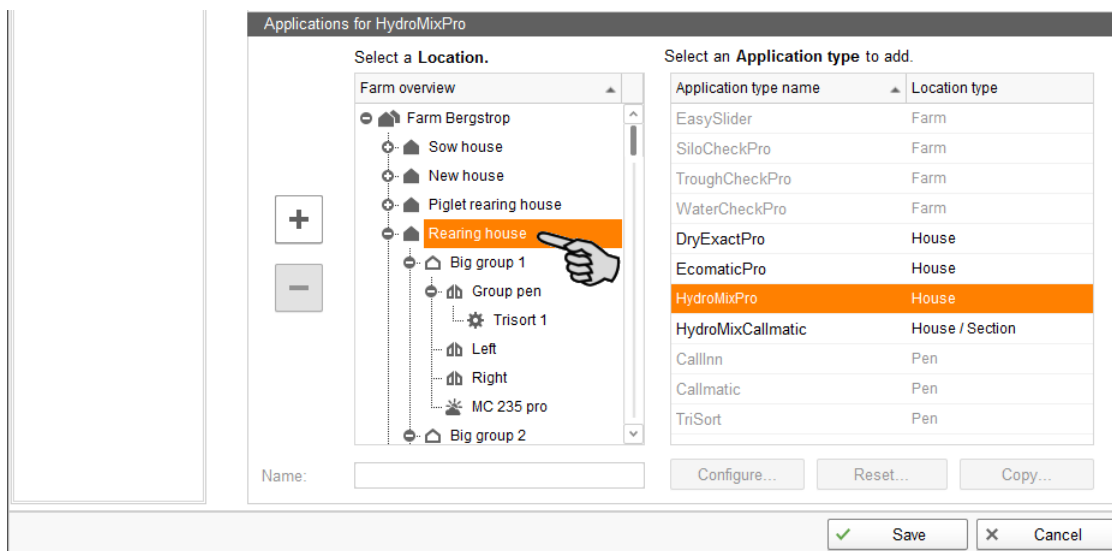
4. Enter a name for the control computer.



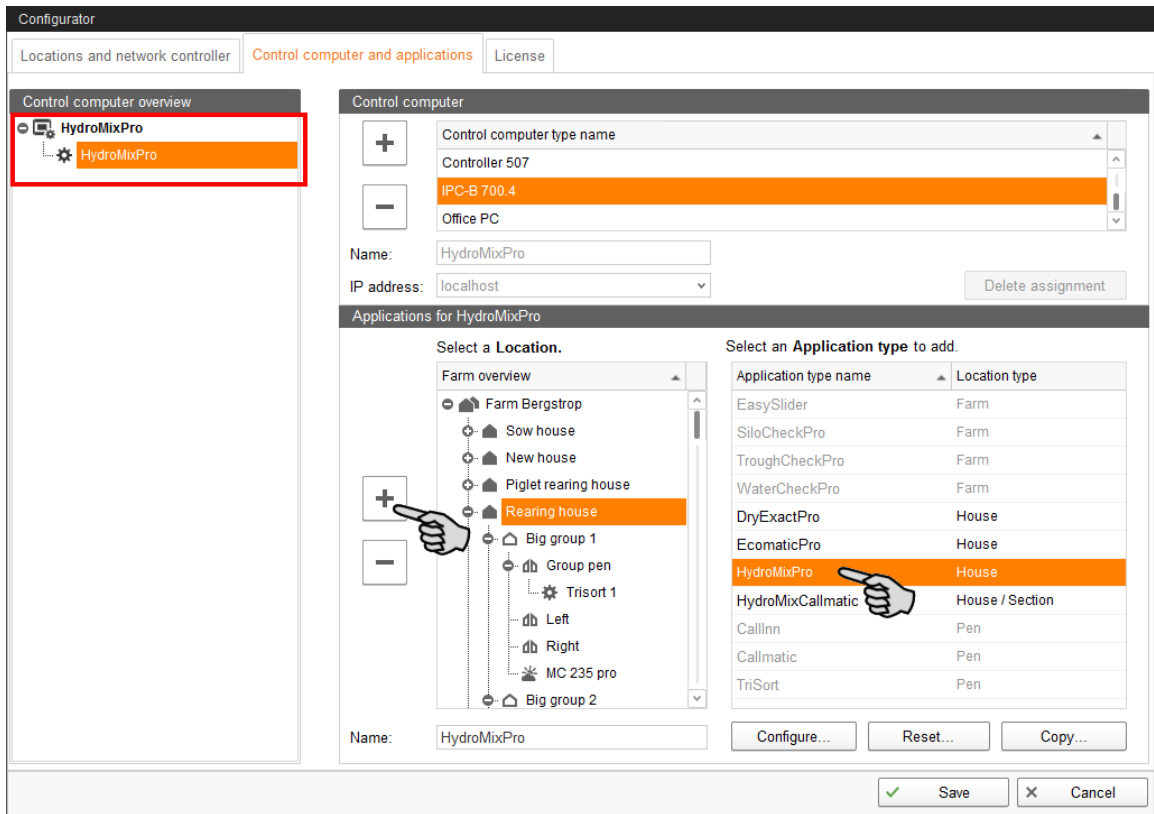
5. From the lower part of the window under "Applications for...", select the location where the system is to be used.

The applications available for selection depend on the selected location.

The HydroMixpro application can only be added to the "House" level.

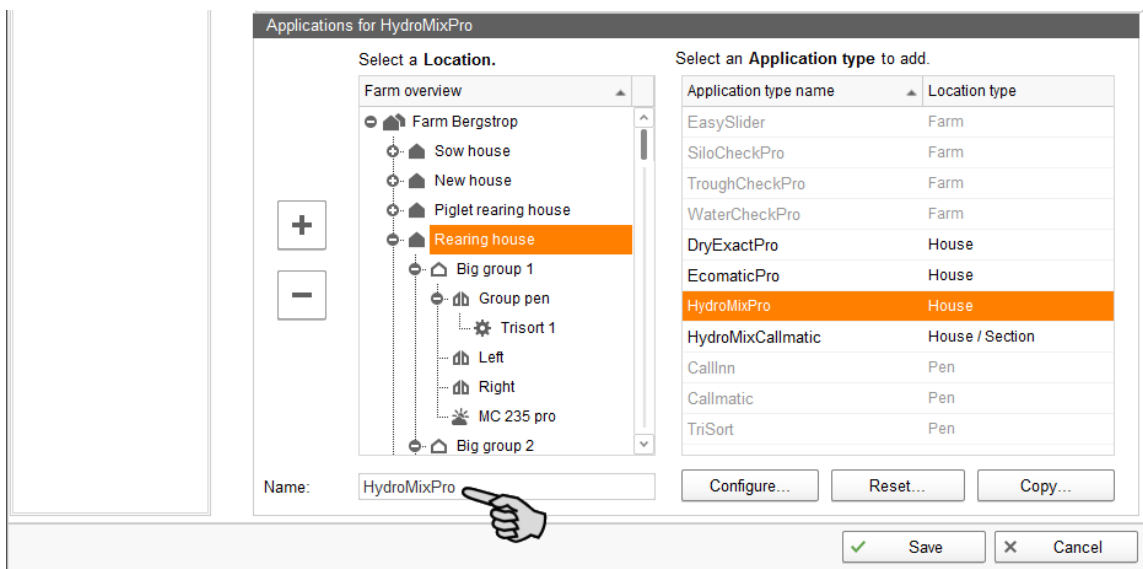


6. Select the correct application in the table on the right and click on the plus button to the left.

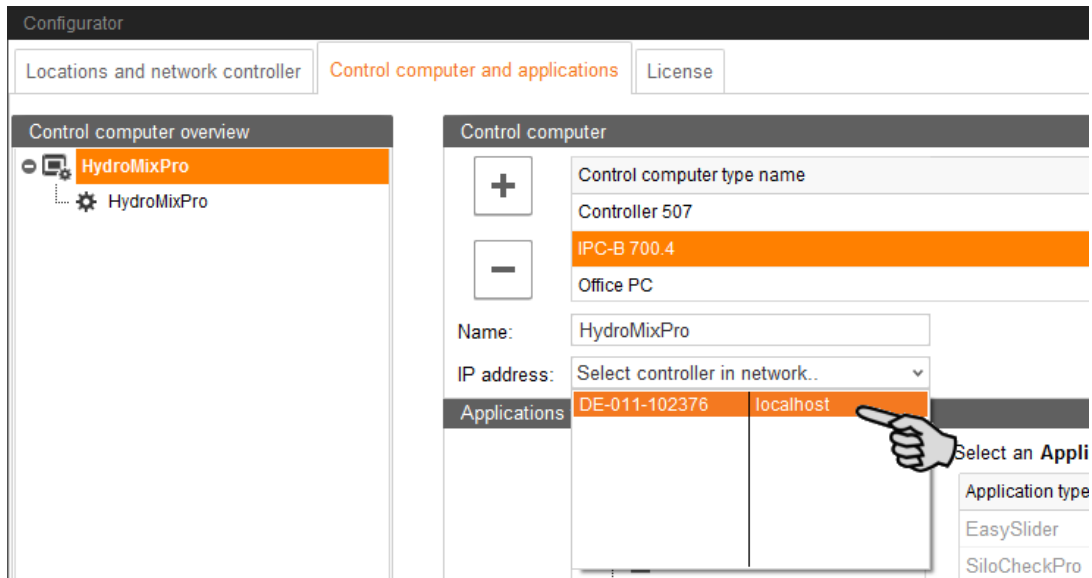


The selected application is assigned to the control computer in the left-hand part under "Control computer overview". In the structure, the control computer is displayed on the upper level and the respective application in the lower level.

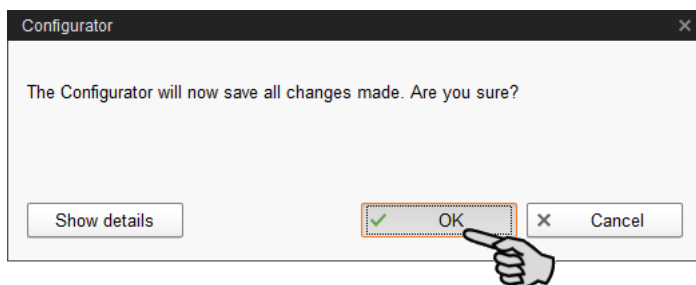
7. Enter a name for the application.



8. Click on the level of the control computer in the left-hand part of the window under "Control computer overview":
9. Assign the corresponding IP address to the control computer, if known.
If the IP address has not been set up yet, you will need to add it later on.



10. Click on "Save" in the bottom command bar of the "Configurator" window after having configured all settings.
11. Confirm these settings by clicking on "OK".



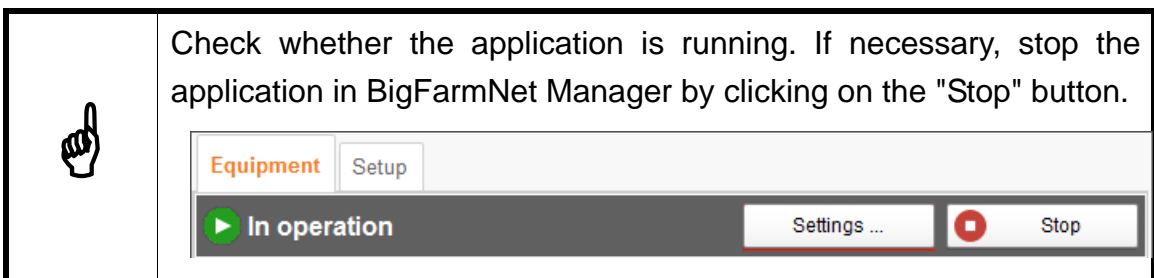
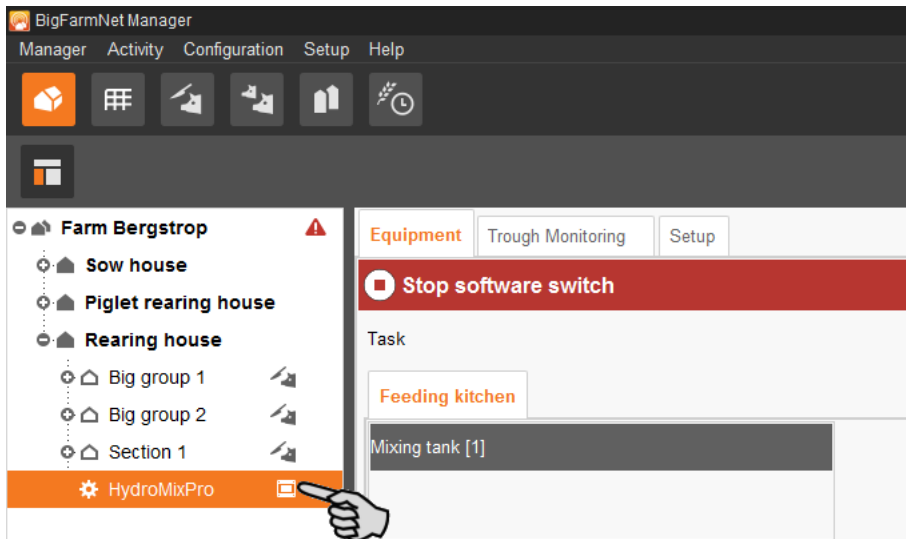
12. Confirm these settings again by clicking on "OK" in the next window.



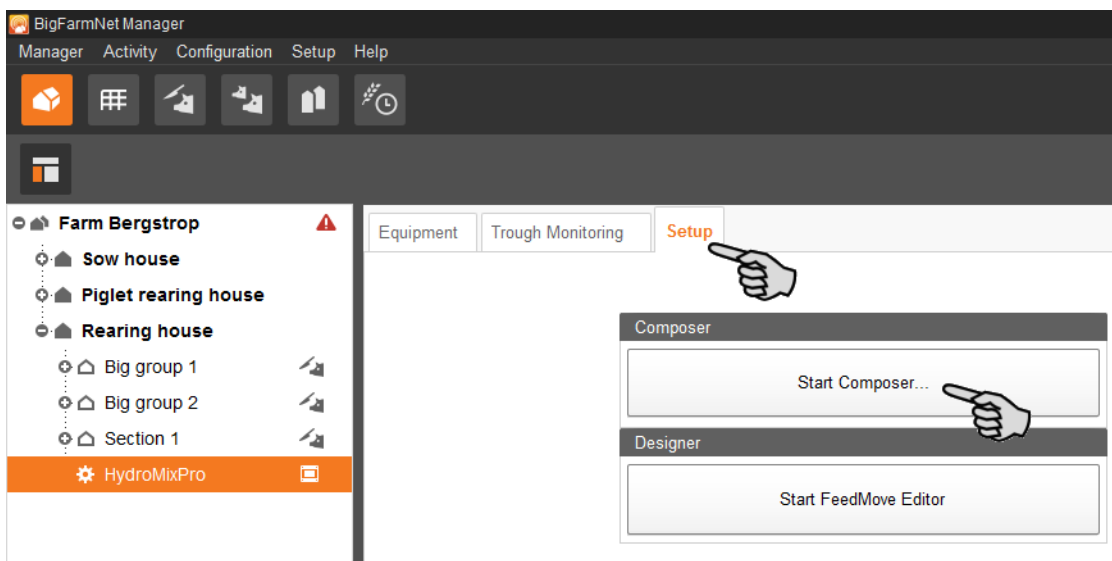
2.2 Configuring settings in the Composer

The Composer is used to configure the system according to the mechanical situation. All functions of the installed system must usually be defined once here. Proceed as follows:

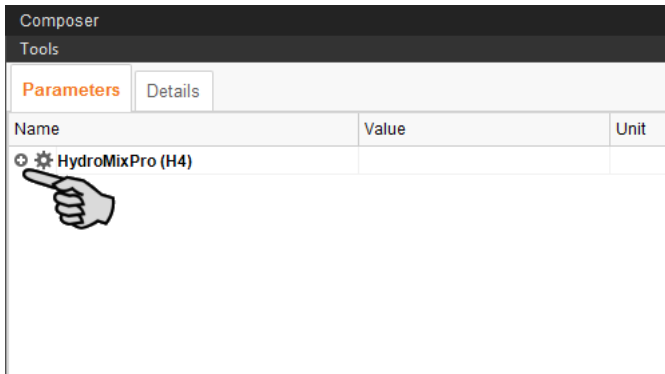
1. In the farm structure, click on the controller icon of the system you want to edit.



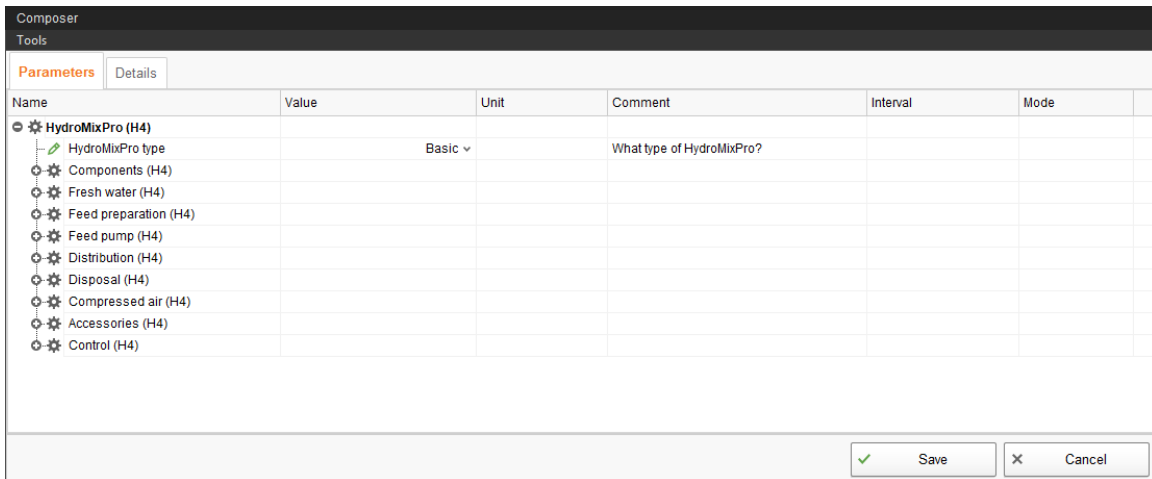
2. In the "Setup" tab, click on the "Start Composer" button.



3. Click on the plus icon to see the different parameters.
 - a) Also open subordinate parameters by clicking on the respective plus icon.

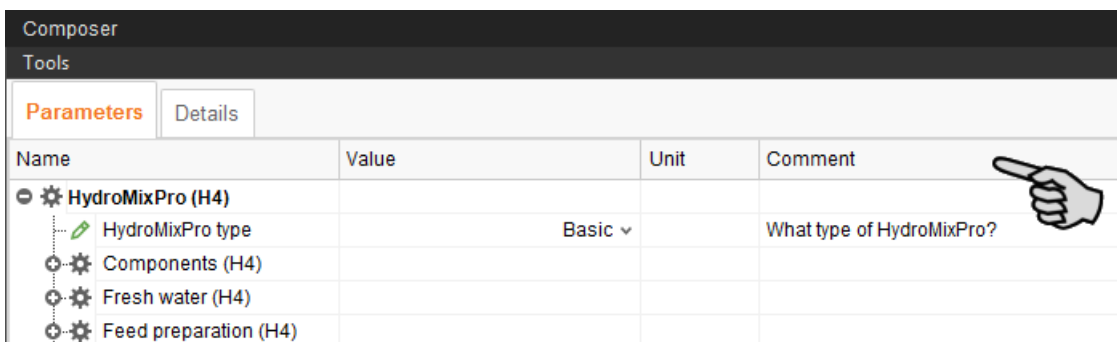


4. Configure the settings in accordance with the structure of the HydroMix system. Change pre-set values, if necessary.



Parameter definition

The column "Comment" contains the basic information for all setting parameters. In the following, all Composer parameters are listed, including additional information on specific parameters.



- **HydroMix type**

- Basic: system with one mixing tank without used water tank
- BasicV: system with one mixing tank and weighed used water tank

- **Components**

Define the component supply using this parameter. First, select the number of individual supply systems. Depending on the selected supply system, new sections including setting parameters appear.

Name	Value	Unit	Comment
HydroMixPro (H4)			
HydroMixPro type		Basic ▾	What type of HydroMixPro?
Components (H4)			
Silo groups	2		Number of silo groups?
Dry mineral dosing units	0		Number of dry mineral dosing units
CCMs	0		Number of CCMs
MediINJECTs	0		Number of MediINJECTs
Liquid mineral dosing units	2		Number of liquid mineral dosing units
Liquid add on unit groups	0		Number of groups of liquid component tanks. The tanks in the group share the same pump.
Pre-mixing tanks	0		Number of pre-mixing tanks
Bunker silos	0		Number of bunker silos
Silo group [1] (H4)			
Silo group [2] (H4)			
Liquid mineral dosing [1] (H4)			
Liquid mineral dosing [2] (H4)			

- A **silo group** is a direct connection to the mixing tank. In each silo group, define the number of silos with dry components ("dry silo") that share a collecting auger. Depending on the number of dry silos, new sections including setting parameters appear.

Name	Value	Unit	Comment
Silo group [1] (H4)			
Silos	3		Number of silos
Silo unit [1] (H4)			
Agitator	None ▾		Is there an agitator? if yes, what kind of control?
Vibrator	<input type="checkbox"/>		Is there a vibrator?
Scale	<input type="checkbox"/>		Is there a scale?
Sensors	None ▾		Is there a min sensor, a max sensor or both?
Silo unit [2] (H4)			
Silo unit [3] (H4)			

A silo group can also be just one silo that is directly connected to the mixing tank by its own auger.

Agitator: Type of agitator for a dry silo.

Vibrator: If the silo is equipped with a vibrator, this vibrator is activated if no components are removed within the set dosing time. The goal is to dispense components from the silo. As soon as a minimum dosing speed has been reached, the vibrator switches off again while dosing continues.

If no components are removed from the silo within the dosing time despite a running vibrator, the system either switches to a replacement silo or goes into error mode.

Scale: The silo scale currently monitors the weight of the silo and generates an alarm in case of an unexpected weight loss.

Sensors: Information on the use of the sensors.


The information "Min. sensor" is used to recognize an empty silo.

The information "Max. sensor" is not yet in use by the current control system.






- Below **Liquid add-on unit group**, define the number of tank groups for liquid components ("liquid silo") that share one pump for removal of components.

Below **Supply groups**, define again the number of liquid silo groups that share not only a pump but the connection to the mixing tank. The parameter section **Supply group** appears based on the given number. Define the number of silos that share one connection to the mixing tank below the parameter **Liquid add-on units**.

Liquid add on unit group [1] (H4)		
Supply groups		Number of groups of liquid component tanks. The tanks in the group share the same pipe to mixing tank.
Pump	Direct switch on ▾	
Connected to mixing tanks	<input checked="" type="checkbox"/>	Connected to mixing tanks?
Connected to pre-mixing tanks	<input type="checkbox"/>	Connected to pre-mixing tanks?
Supply group [1] (H4)		
Liquid add on units		Number of liquid component tanks
Liquid add on unit [1] (H4)		
Recirculation	<input checked="" type="checkbox"/>	Is recirculation possible?
Direct connection to feed pump	<input type="checkbox"/>	Is there a direct connection to a feed pump?
Liquid add on (H4)		
Agitator	Direct switch on ▾	Is there an agitator? If yes, what kind of control
Scale	<input type="checkbox"/>	Is there a scale?
Sensors	Min sensor ▾	Is there a min sensor, a max sensor or both?

	<p>A "liquid add-on unit group" may also be just one liquid silo with its own pump for removal of components.</p>
---	---

- If a **pre-mixer** is connected with a **bunker silo**, enter the number of signal outputs to request the bunker silo in the parameter section **Pre-mixing unit** below **Bunker silo signals**. The outputs must be part of the feed move from the bunker silo to the pre-mixer.

Pre-mixing unit [1] (H4)		
	Pump	Direct switch on <input type="checkbox"/> Is there an own pump? If yes, what kind of control?
	Input flap	1 How many input flaps?
	Agitator	Direct switch on <input type="checkbox"/> Control type of agitator
	Foggers	1 How many foggers?
	Bunker silo signals	3 How many bunker silo signals?








- **Fresh water**

The parameter **Scale FWT** (fresh water tank) is currently not supported.

- **Feed preparation**
- **Feed pump**
- **Distribution**

Define the feed move route here.

- Provide information on the recipe branch lines below **Feed phase line group**.

Feed phase line group [1] (H4)		
	Feed phase lines	3 Number of feed phase lines
	Branch lines	3 Number of branch lines
	Branch line distribution [1](H4.1)	
	Sub-branch lines	0 Number of sub-branch lines
	Valves	3 Number of valves
	Trough sensor type	Without trough sensor <input type="checkbox"/> Without trough sensor, digital trough sensor
	MediINJECT type	None <input type="checkbox"/> Type of MediINJECT

- A **main circuit** is a group of subcircuits. Subcircuits are connected to the feed kitchen through a supply pipe and a removal pipe. Both these pipes do not have feed valves. The volume of the supply tube can be defined in the FeedMove Editor, see chapter 2.3.8 "Feed move settings", page 25. This volume is considered for residue-free distribution of feed in the subcircuits.

Main circuit [1] (H4.1)			
Circuits	1	Number of circuits	
Simple circuit distribution [1] (H4.1)			
Sub-branch lines	0	Number of sub-branch lines	
Valves	3	Number of valves	
Trough sensor type	Without trough sensor	Without trough sensor, digital trough sensor	
MediINJECT type	None	Type of MediINJECT	

- **Disposal**
- **Compressed air**
- **Accessories**

You may add additional system components such as valves, pumps and augers for the feed move route later on below this parameter.

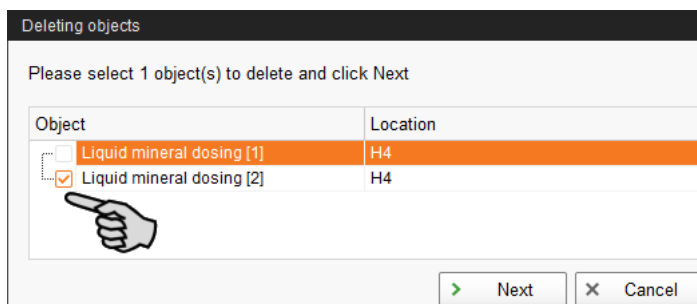
Accessories (H4)			
Valves	0	Number of additional valves	
Pumps	0	Number of additional pumps	
Pipe connectors	0	Number of additional pipe connectors	
Connecting augers	0	Number of connecting augers	
Cross conveyors	0	Number of cross conveyors	
Collecting augers	0	Number of collecting augers	

- **Control**
5. Proceed as follows to delete system components:

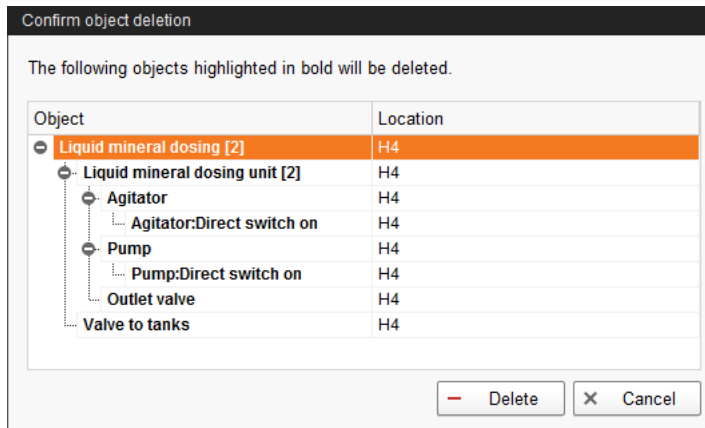
- a) Enter the new quantity (a lower number or 0) and press Enter.

This opens a new dialog window that shows the system components with their assigned locations.

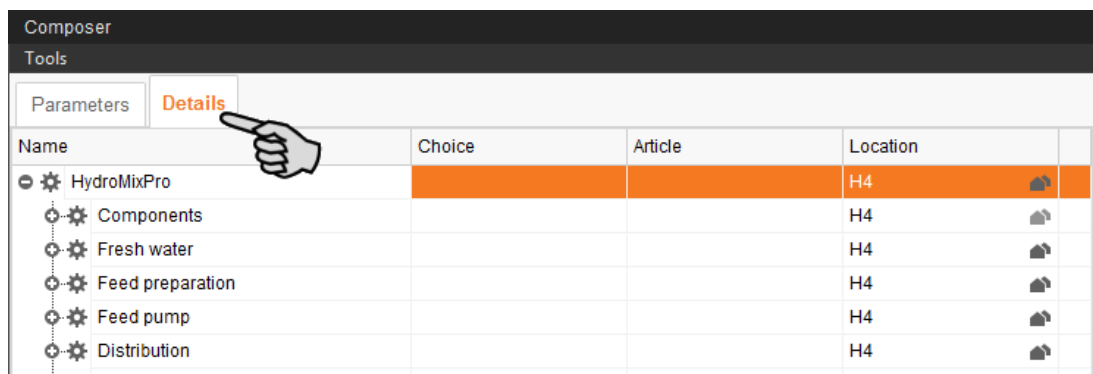
- b) Select the object(s) you wish to delete and click on "Next".



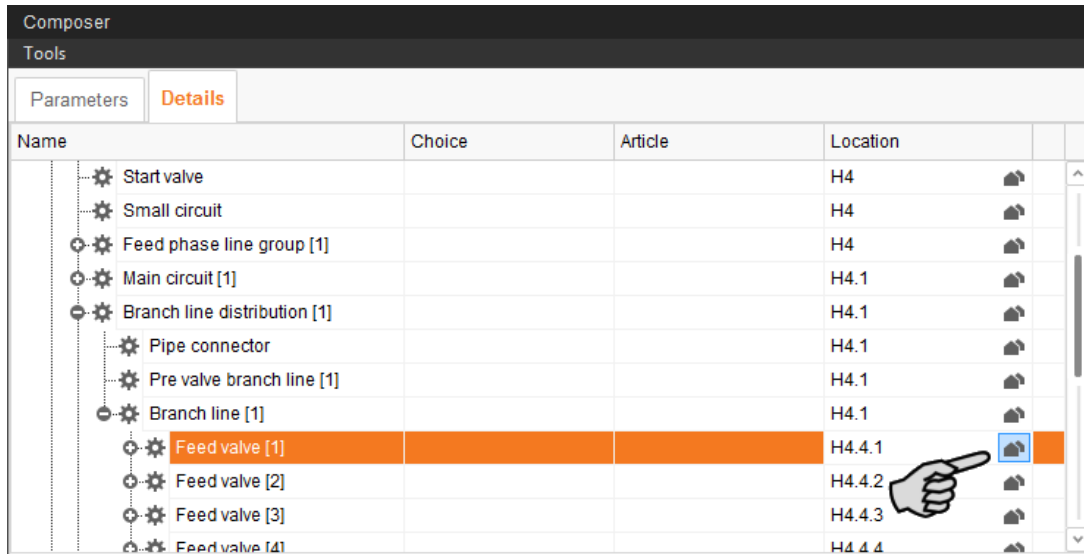
- c) In the next window, confirm that you want to delete the object(s) shown by clicking on "Delete".



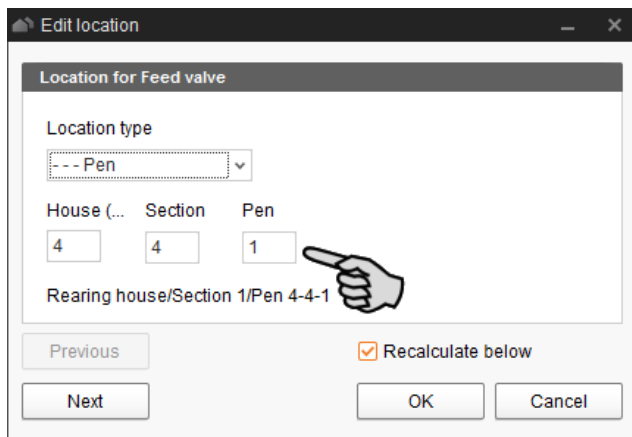
6. Click on the "Details" tab. Open the structure by clicking on the plus icon. The structure shows all location-related components of the system.



7. Assign the correct location to HydroMix and/or the individual system components.
 - a) Click on the house icon of the system component.



- b) In the next window, enter the number of the correct location.
The selected location is displayed in its entirety below the input field.



- c) If necessary, check the box "Recalculate below".
All below (subordinate) system components are then automatically assigned to the new location.

Location for Feed valve

Location type
 - - Pen


House (...) Section Pen
 4 4 1

Rearing house/Section 1/Pen 4-4-1

Previous Recalculate below


Next OK Cancel

- d) Click on "Next" to continue assigning locations to the system components on the same level.
- e) Click on "OK" after you have finished to accept the input.

	If your farm works with multiple control computers, assign each control computer its own location.
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8. If necessary, enter a name for the silos so the assignment is clearer.
 - a) Click on the silo and add its location or the planned component, e.g. "Silo_Wheat".

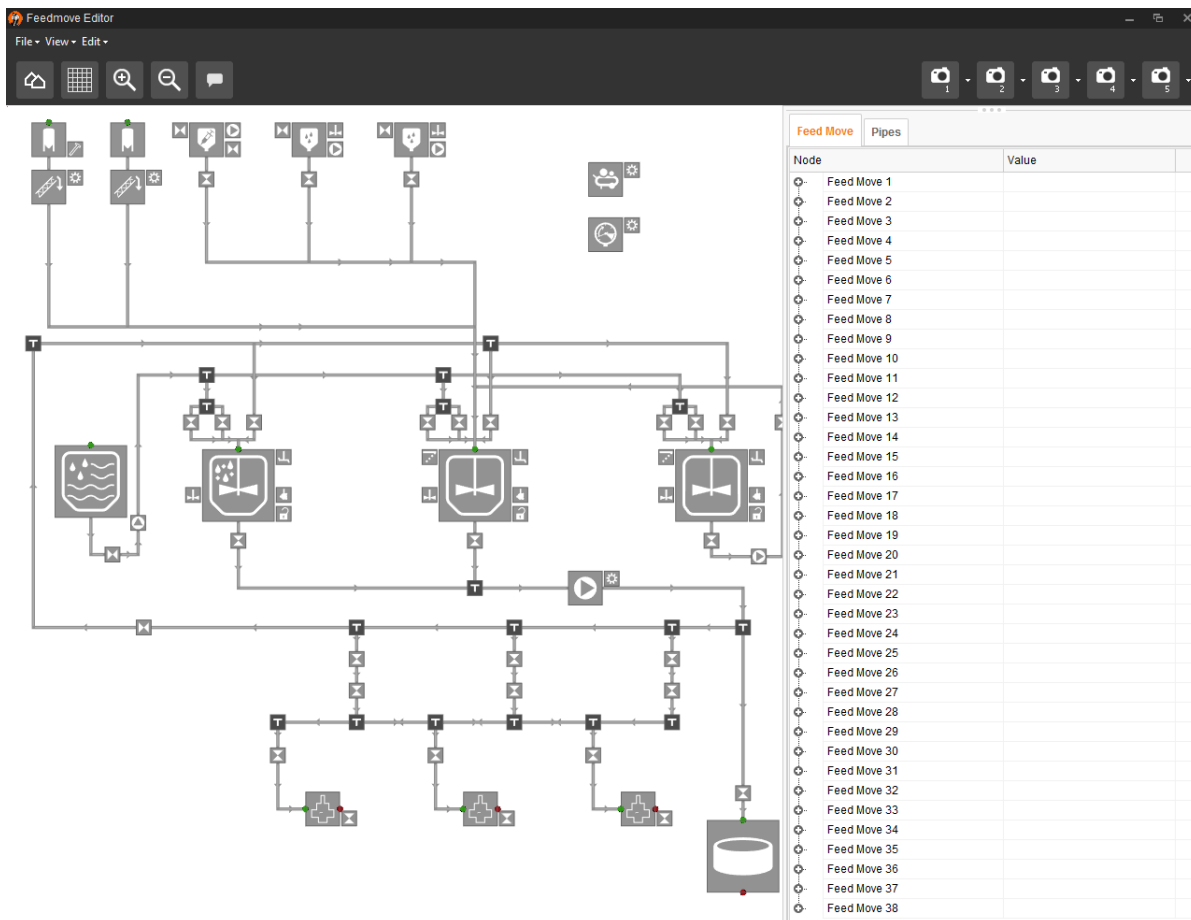
For entering the silo name, please also refer to "Settings" in chapter 5.2 "Silo data".

	<p>Check list Composer:</p> <ul style="list-style-type: none"> • Did you open all system components using the structure? • Did you configure all settings according to the structure of the system? • Did you assign all system components to the correct location (refer to the house plan)?
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9. Click on "Save" to accept all settings for the Composer.

2.3 Depicting the system in the FeedMove Editor

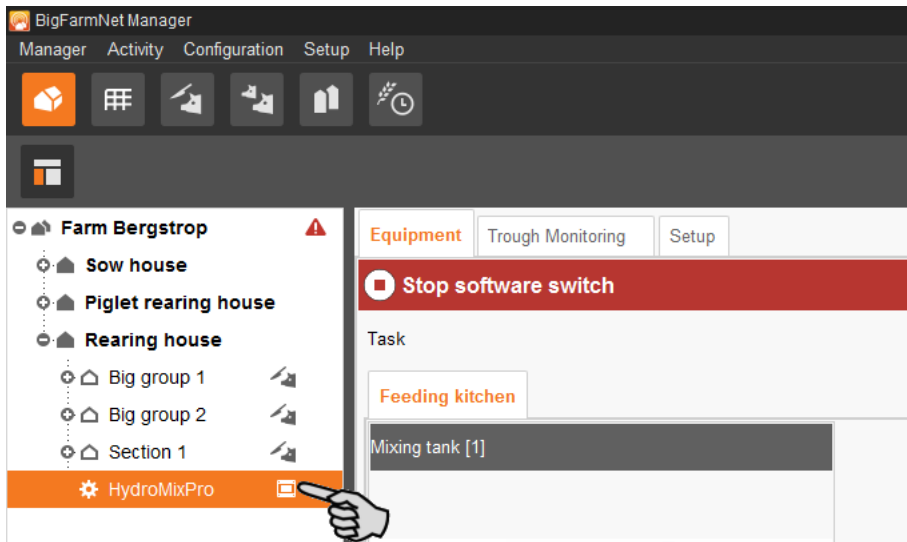
The FeedMove Editor is a program used to edit the graphical depiction of the installed system. All system components you have created in the Composer are displayed as icons in the FeedMove Editor. In the FeedMove Editor, you can connect the individual system components according to the installed system. You thus define the route of the feed transport.



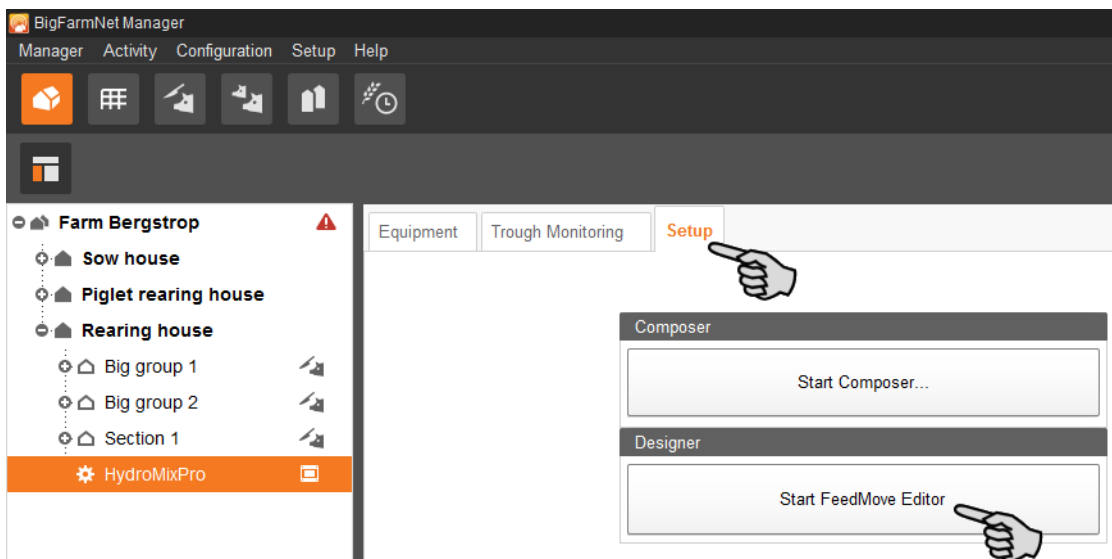
The final graphical depiction is shown in the application window under the new tab "View" later on. This graphical depiction provides you with an overview of the system functions running during operation. You can also operate the system manually with the BigFarmNet Manager, see chapter 2.5 "Manually controlling the system components", page 52.

Start the FeedMove Editor as follows:

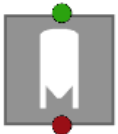
1. In the farm structure, click on the controller icon of the system you want to edit.



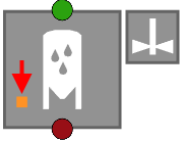
- In the "Setup" tab, click on the "Start FeedMove Editor..." button.
The "FeedMove Editor" opens in a new window.



2.3.1 Icons of the system components



Silo dry



Liquid add-on unit, agitator and minimum sensor



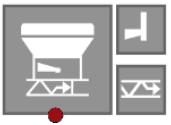
Mineral dosing unit dry



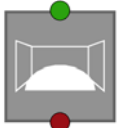
Mineral dosing unit liquid



MediINJECT



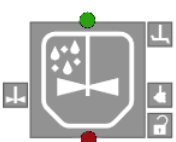
CCM



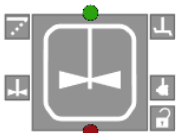
Bunker silo



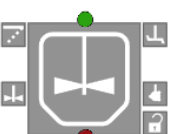
Fresh water tank



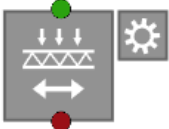
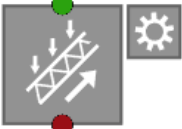
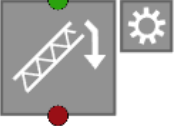
















Used water tank



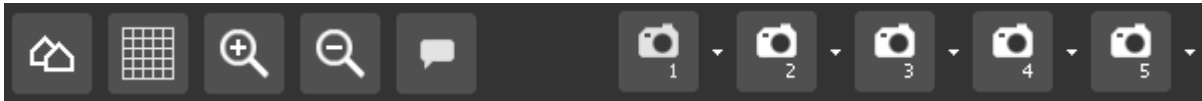
Pre-mixer




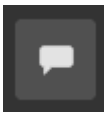



Mixing tank

	Cross conveyor
	Collecting auger
	Dosing auger / FlexVey
	Feed valve
	Compressed air monitoring
	Reciprocating compressor
	Feed pump
	Pump general
	Vibrator
	Agitator
	Valve
	Input flap
	Fogger
	Cleaner
	Security lock / tank blocking
	Blade CCM
	Slope auger CCM
	Drive unit
	Pipe connector

2.3.2 Basic functions

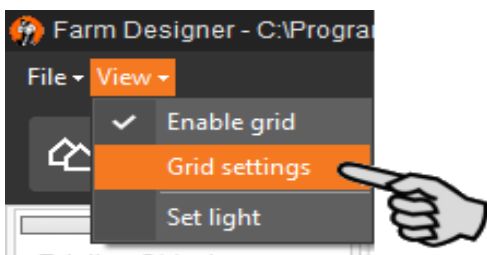


	View	Complete, enlarged view of the system
	Grid	Showing and hiding the grid lines in the drawing pane
	Zoom in/Zoom out	Zooming of the current view in the drawing pane
	Description	Showing and hiding the names of the individual system components
	Cameras	Saving of different system views

2.3.3 Configuring the grid

You can align system components with a grid, "Showing and hiding the grid lines", see chapter 2.3.2 "Basic functions". The default grid setting is a line-to-line distance of 1 m. Adjust the size of the grid as follows, if necessary:

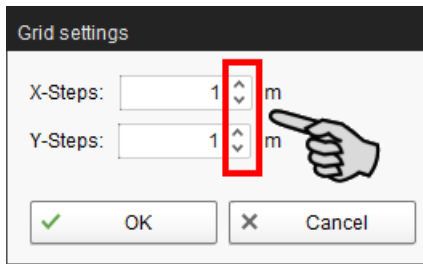
1. Click on "Grid settings" in the "View" menu.



2. Enter the desired value into the input fields next to "X-Steps" and "Y-Steps" to change the size of the grid.

Or:

Click on the arrows pointing upwards and downwards on the right of the input field to change the value.



3. Accept these inputs by clicking on "OK".

2.3.4 Adjusting and saving views

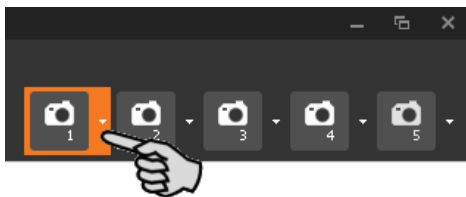
Adjust the desired view of the window as follows in the drawing pane:

- Zooming in and out:
 - Roll the scroll wheel of your mouse.
- Moving to the left and to the right:
 - Hold down the Shift key while rolling the scroll wheel of your mouse.
- Moving up and down:
 - Hold down the Control (Ctrl) key while rolling the scroll wheel of your mouse.

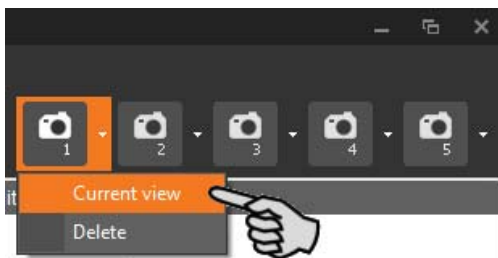
Save specific views of your system.

You can retrieve saved views later on in the application window under the "View" tab. Depending on the number of camera icons in the top bar, you can save up to five different views.

1. Adjust the view as required.
2. Click on the arrow pointing downwards at one of the camera icons.




3. Click on "Current view" in the context menu. The view is now saved.



4. If you would like to retrieve the saved view later on, click on the corresponding camera icon.

2.3.5 Selecting and moving system components

1. Move the mouse pointer over the respective system component.

The mouse pointer will change its shape . The name of the system component is additionally displayed as tooltip for a moment.

2. Click on the system component and hold the mouse button.

The colour of the system component changes to orange.

3. Move the system component to the required position and release the mouse button.

Or:

1. Select multiple system components

- a) by drawing a rectangle over the system components while holding the left mouse button

Or:

by clicking on the different system components while holding the Ctrl key.

The colour of the selected components changes to orange.

2. Click into the selected area and hold the mouse button.
3. Move the system component to the required position and release the mouse button.



You can also move objects that are marked orange using the arrow keys on your keyboard.

2.3.6 Linking system components

For the HydroMix pro application, the links between the system components, also called feed moves, are pre-defined.




If you would like to use the default feed moves, make sure that they are possible with the system you have installed.

To change an existing configuration, you may delete feed moves and re-link system components.

1. Delete individual feed moves as follows:

- a) Move the mouse pointer to the link you want to change.

The mouse pointer will change its shape .

- b) Click on the link.

The colour of the link changes to orange.

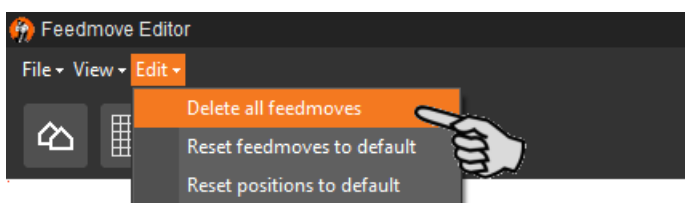
- c) Press the "Delete" key on your keyboard.

The link is deleted.

OR:

Delete all links as follows:


- a) In the menu "Edit", click on "Delete all feed moves".

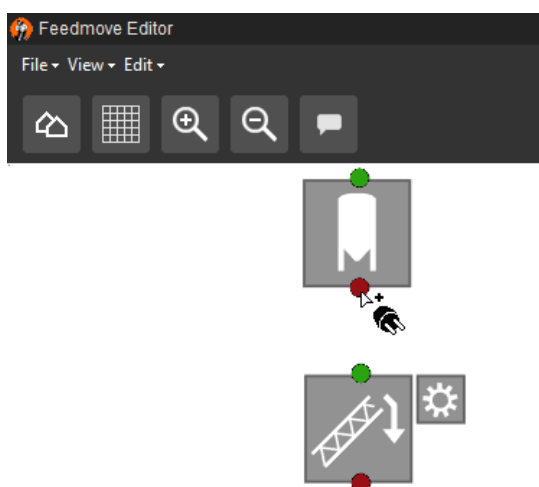


If you have changed the EcoMatic configuration, you can restore all pre-set feed moves to return to working with the default configuration.

- a) In the menu "Edit", click on "Reset feed moves to default".


2. Move your mouse pointer to the **red dot** of the specific system component.

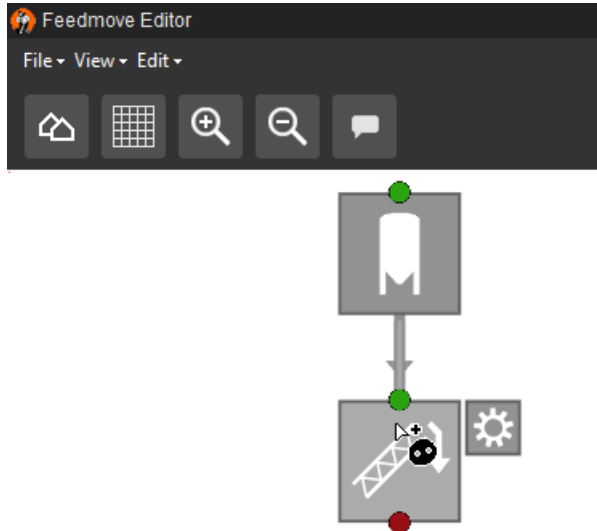
The mouse pointer will change its shape .



3. Click on the red dot and hold the mouse button.

4. Move the mouse pointer over the icon of the system component to which you want to link the selected system component.

The mouse pointer will change its shape  and a line linking both components appears. The flow direction is indicated by an arrow within the line.



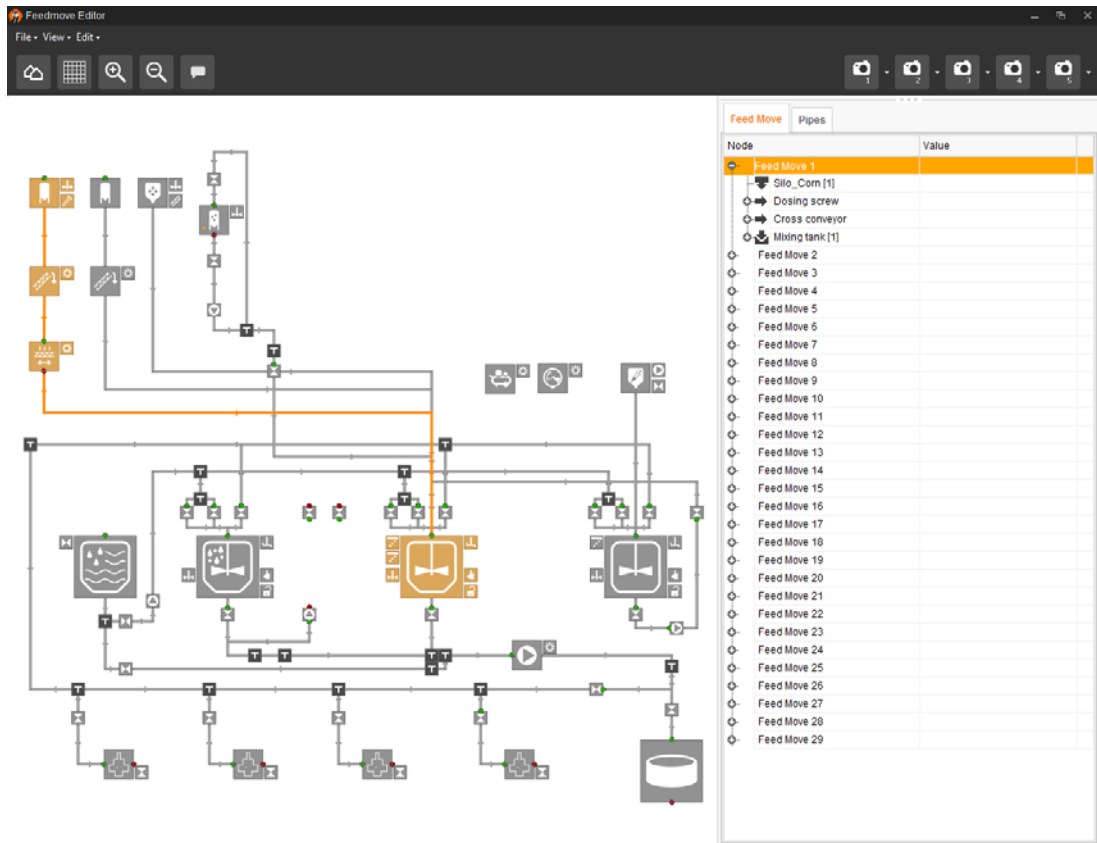
5. Release the mouse button.

The two system components are now linked. The corresponding feed move is created in the window to the right.

Linked system components without green or red dot cannot be linked further.

6. Continue linking all system components so that all feed move routes are displayed correctly.
7. To check a link, select a feed move in the window to the right.
 - a) Click on a feed move.

The corresponding part of the route is marked orange in the overview. Furthermore, the feed move structure opens and all technical elements belonging to this move are displayed.



2.3.7 Adding system components subsequently

If you need additional system components for a system you have already generated with the FeedMove Editor, such as pipe connectors or valves, you need to return to the Composer. Select all additionally required system components in the Composer below the parameter "Accessories", see chapter 2.2 "Configuring settings in the Composer", page 7.

Accessories (H4)			
	Valves	0	Number of additional valves
	Pumps	0	Number of additional pumps
	Pipe connectors	0	Number of additional pipe connectors
	Connecting augers	0	Number of connecting augers
	Cross conveyors	0	Number of cross conveyors
	Collecting augers	0	Number of collecting augers

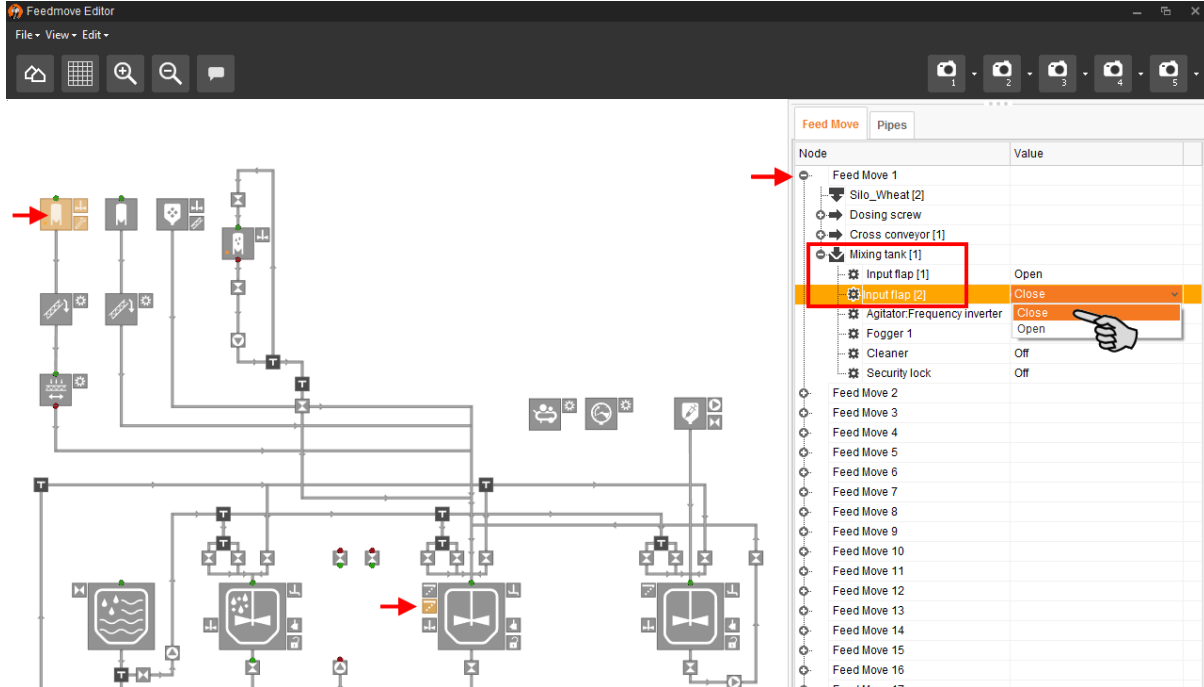
2.3.8 Feed move settings

The following settings are configured directly in the feed move in the FeedMove Editor:

- Infeed with more than one input flap
- Direction of rotation of the cross conveyor
- Volume of the supply pipes

Infeed with more than one input flap

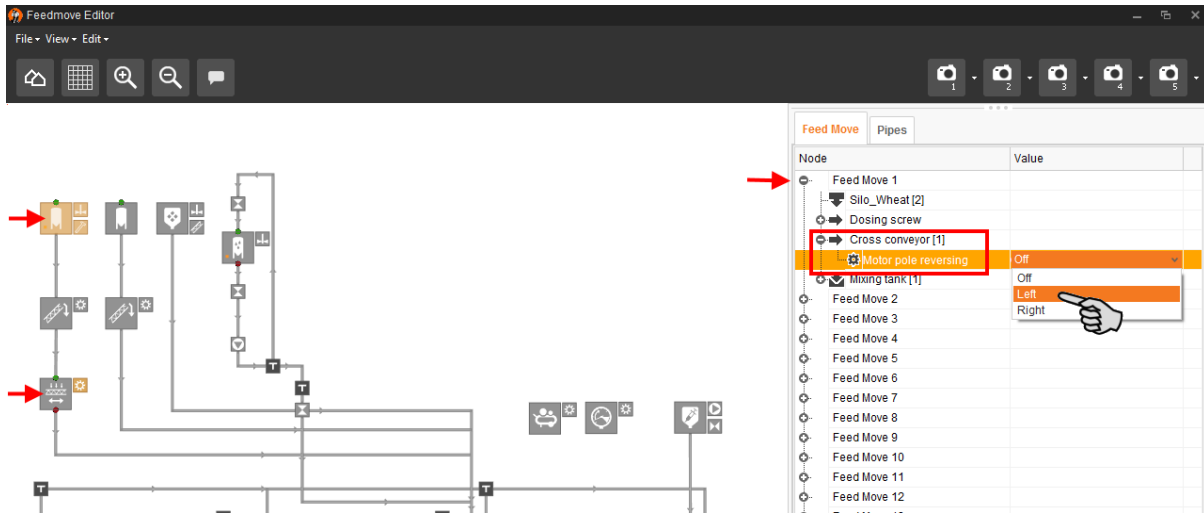
If two input flaps have been generated for one mixing tank, define which flap should be open and which one should be closed for the feed move from the silo to the mixing tank. The same applies to a pre-mixer.



1. Click on the respective feed move.
Click on the plus icons to open the structure. The subordinate system components appear.
2. Change the values for the input flaps below "Mixing tank".

Direction of rotation of the cross conveyor

If a cross conveyor is used to transport feed from the silo to the mixing tank or to the pre-mixer, define the rotating direction, either to the left or to the right.



1. Click on the respective feed move.

Click on the plus icons to open the structure. The subordinate system components appear.

2. Change the values for the direction of rotation below "Cross conveyor".

Volume of the supply pipes

If the distribution systems in the feed kitchen are very extensive, the pipes between the feed pump and the circuit start valves contain a large amount of undefined feed. The feed amount can be moved forward in defined steps in the small circuit (feed kitchen circuit) if the distance between the circuit start valves has been defined. This means that the feed amount is pushed towards the circuit start valves as far as possible without causing the feed to mix with another component or water. Define the distance between the circuit start valves by entering the length of the supply pipes. Their volume is then calculated automatically.

Pipe	PipeType	Length [m]	Volume [l]
1	63 x 3,0	0,00	0,00
m [1] - Mixing tank [1]	63 x 3,0	0,00	0,00
Silo_Wheat [2] - Mixing tank [1]	63 x 3,0	0,00	0,00
Liquid mineral dosing unit [1] - Mi...	63 x 3,0	0,00	0,00
Liquid mineral dosing unit [2] - Mi...	63 x 3,0	0,00	0,00
Pipe connector fill MT - Mixing tan...	63 x 3,0	0,00	0,00
Pipe connector fill MT - Mixing tan...	63 x 3,0	0,00	0,00
Pipe connector - Mixing tank [1]	63 x 3,0	0,00	0,00
Mixing tank [1] - Centrifugal pump	63 x 3,0	0,00	0,00
Pipe connector - Pipe connector	63 x 3,0	0,00	0,00
Pipe connector - Pipe connector	63 x 3,0	2,00	5,10
Centrifugal pump - Pipe connector	63 x 3,0	0,00	0,00
	90 x 4,3		
	25 x 1,5		
	75 x 3,6		
	63 x 4,7		
	32 x 1,8		
	16 x 1,5		

1. Click on the "Pipes" tab.

2. Select the correct supply pipe by clicking on it.

Information regarding the selected pipe is highlighted in the list.

3. Select the pipe type from the drop-down menu by double-clicking into the corresponding input field.

4. Enter the length of the pipe and press Enter to confirm your input.

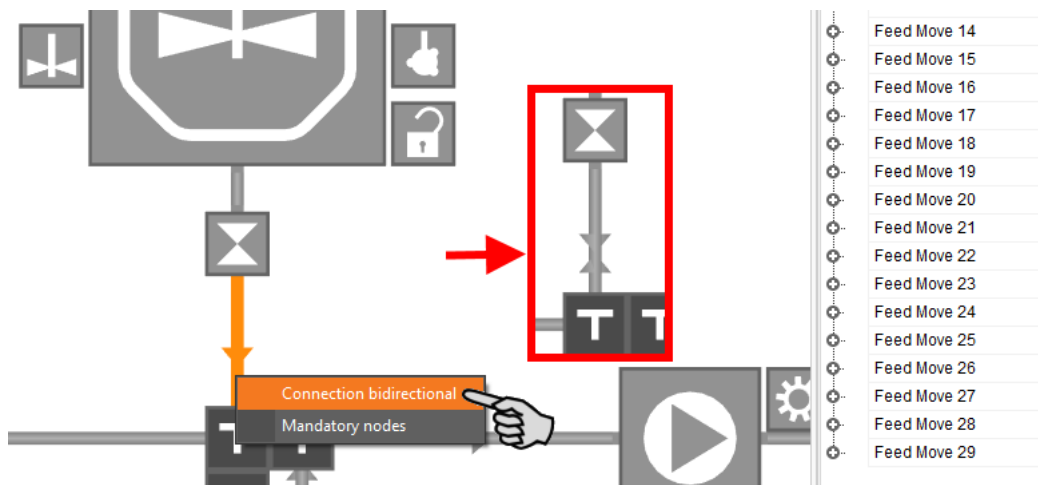
The volume is now calculated automatically.

2.3.9 Changing the flow direction

You may define both flow directions for the feed in all pipes in the FeedMove Editor. An arrow at the pipes shows the flow direction and is defined for one specific direction by default.

1. Click on the respective line to mark it.
2. Right-click on the selected line to open the context menu.
3. Select "Connection bidirectional".

Two arrows appear at the line, indicating both flow directions.



2.3.10 Configuring feed moves

At first, feed moves include all possible feed routes between the different system components, also called nodes. Use these nodes to define the feed moves so that the system knows exactly which feed move is the correct one. This reduces the number of possible feed moves to those that are absolutely mandatory.

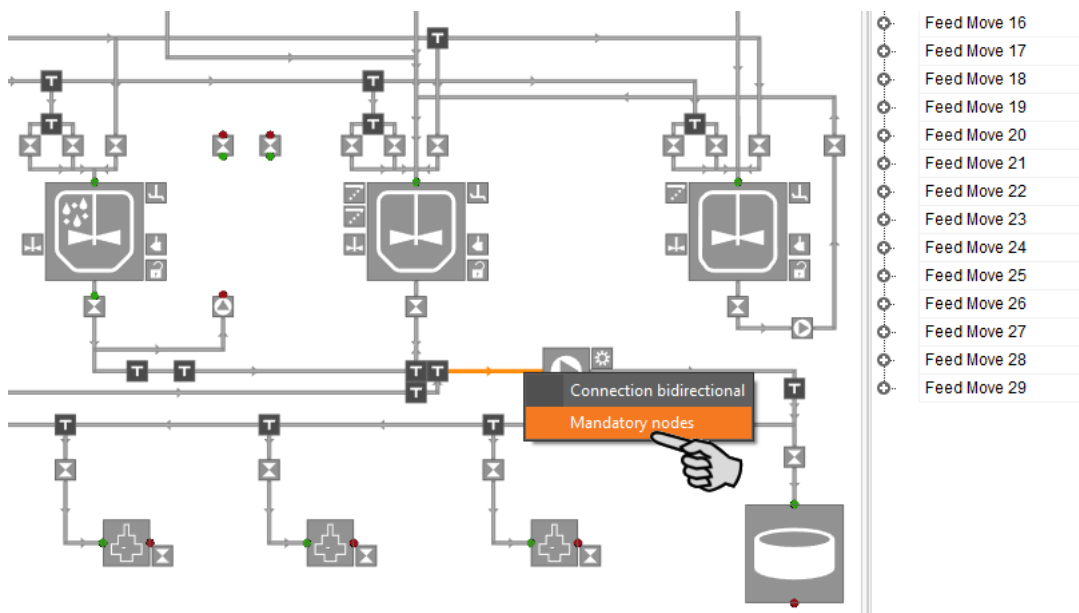


Only service technicians may configure the feed moves using the nodes.

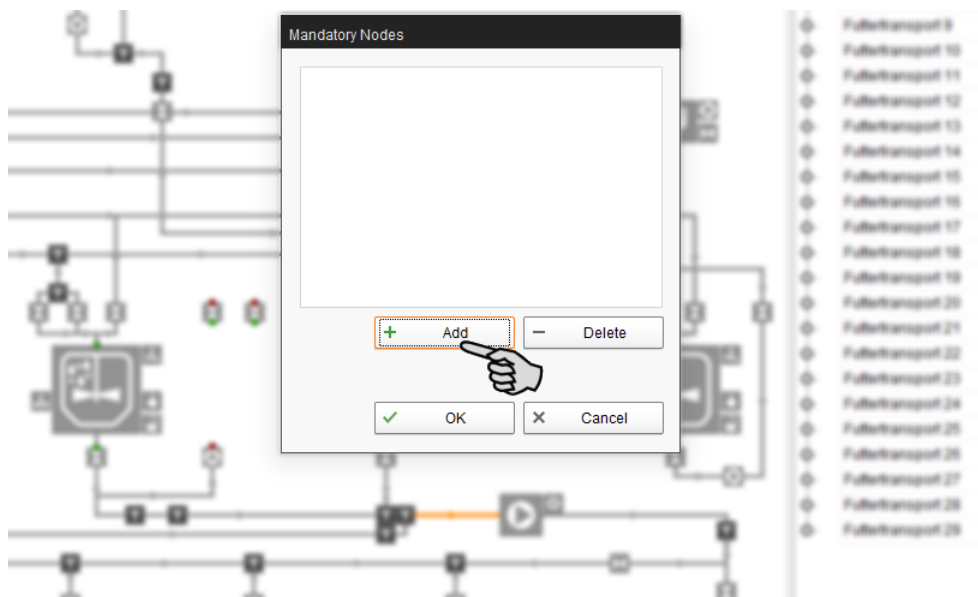
1. Click on the respective line to mark it.
2. Right-click on the selected line to open the context menu.

3. Select "Mandatory nodes".

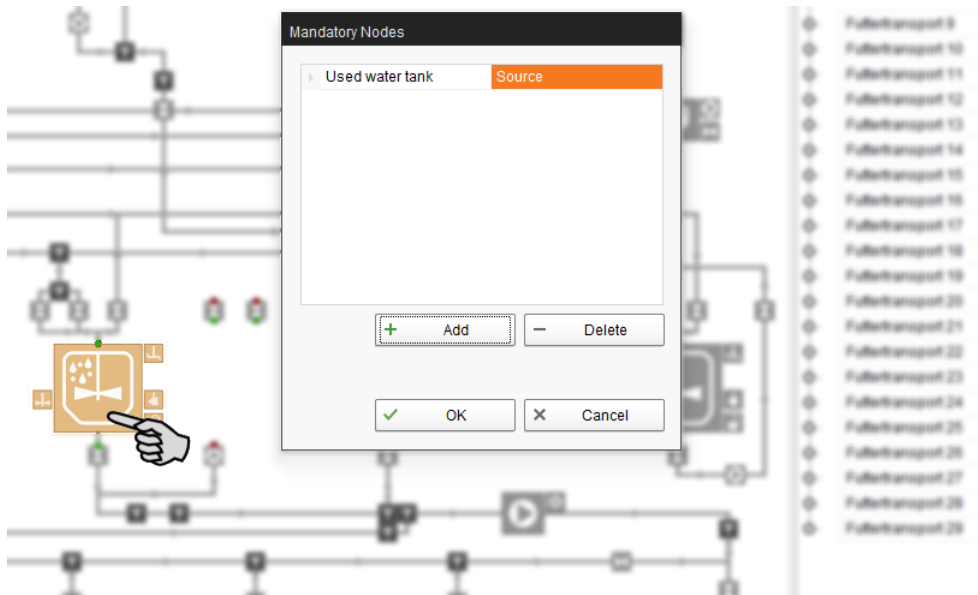
This opens the dialog window "Mandatory nodes".



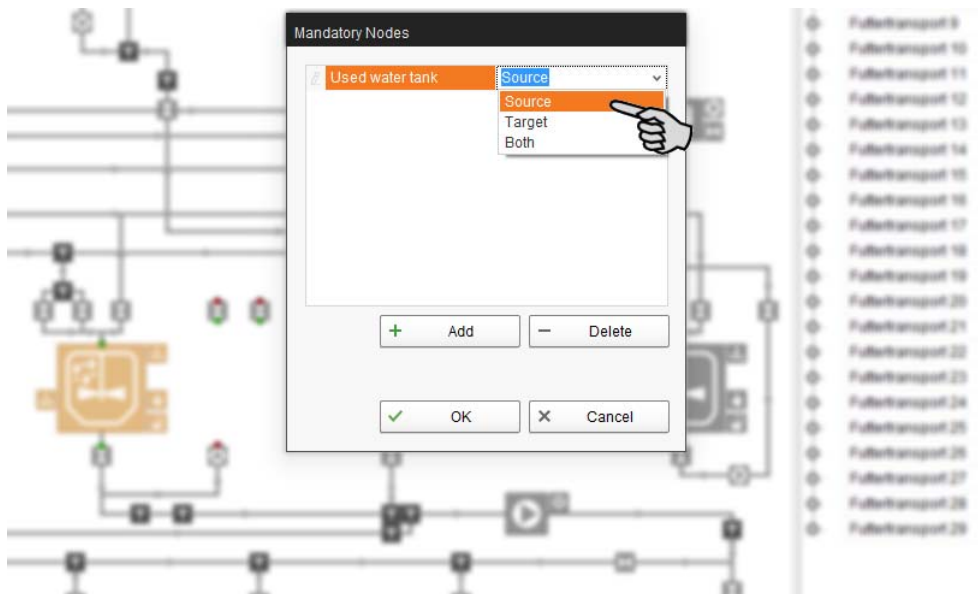
4. Click on "Add".



- Click on the correct node in the graphic (system component, example: used water tank).



- Define the selected node as "Source", "Target" or "Both".



- Add further nodes to the installed system as described above, depending on its structure.
- Click on "OK" to accept these settings.

Any feed moves no longer compatible with the new configuration are removed from the right-hand column. Only the mandatory feed moves remain.

2.3.11 Closing the FeedMove Editor

To finish working in the FeedMove Editor, save and close the program:

1. Save your work by clicking on "File" > "Save" and close the program by clicking on the X in the upper right corner.

OR:

Close the program directly by clicking on the X in the upper right corner.

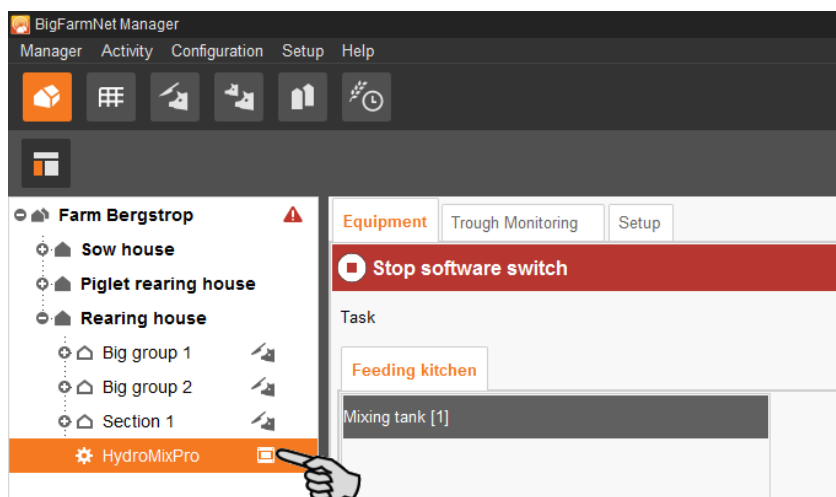
The software automatically recognizes unsaved changes and shows a warning.

2. Click on "Yes" to save your changes.

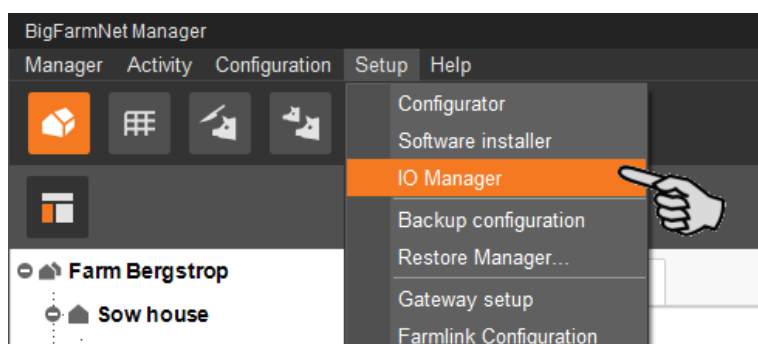
2.4 Configuring the IO Manager

The control is set up in the IO Manager. Assign the functions of the system that were defined in the Composer in the previous step to the IO cards.

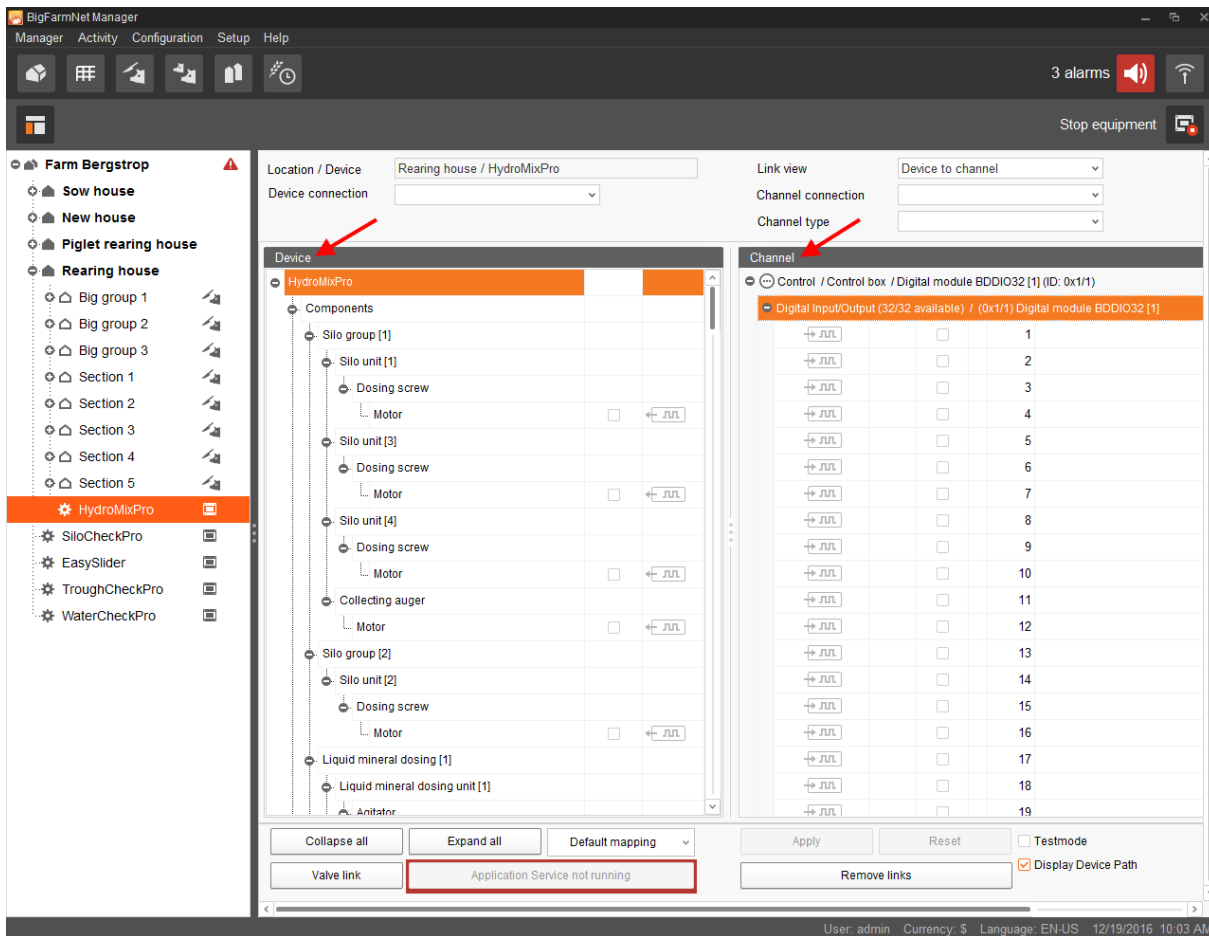
1. In the farm structure, click on the controller icon of the system you want to edit.









2. Click on "IO Manager" in the "Setup" menu.







The IO Manager opens in the application window. The left-hand part of the window shows the individual devices of the system under "Device". The right-hand part of the window displays the channels of the IO cards under "Channel".



The interfaces of the devices and the IO cards are indicated by the following icons:

- Digital output 
- Digital input 
- Analog output 
- Analog input 
- Counter input 
- Serial interface 

Connected devices and channels are indicated by dark gray icons and a green arrow. Example:  

Devices and channels that are not connected are grayed out. Example:  

2.4.1 Order of the IO cards: Lohbus, Izumi

If you use Lohbus or Izumi IO cards, the order of the IO cards in the IO Manager must match that in the control cabinet. Both Lohbus and Izumi are automatically added to the IO Manager after you have selected them in the Composer. The order of the IO cards is arbitrary in the IO Manager.

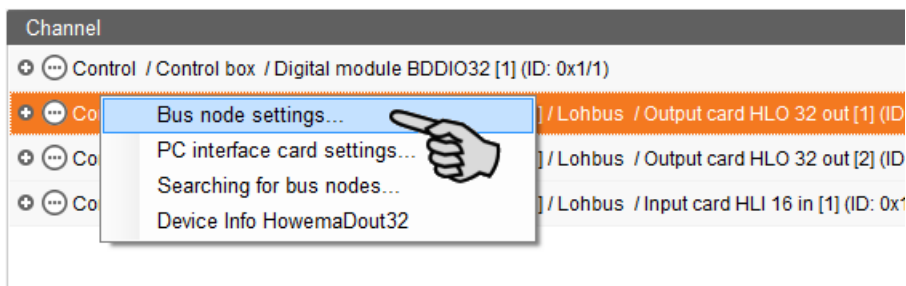


Sort the Lohbus and Izumi IO cards in the IO Manager **before** creating any links.

The following instructions explain how the Lohbus IO cards are sorted. The Izumi IO cards are sorted in the same way.

1. Right-click on one of the Lohbus cards to open the context menu.
2. Click on "Bus node settings" in the context menu.


This opens a new dialog window with the settings.

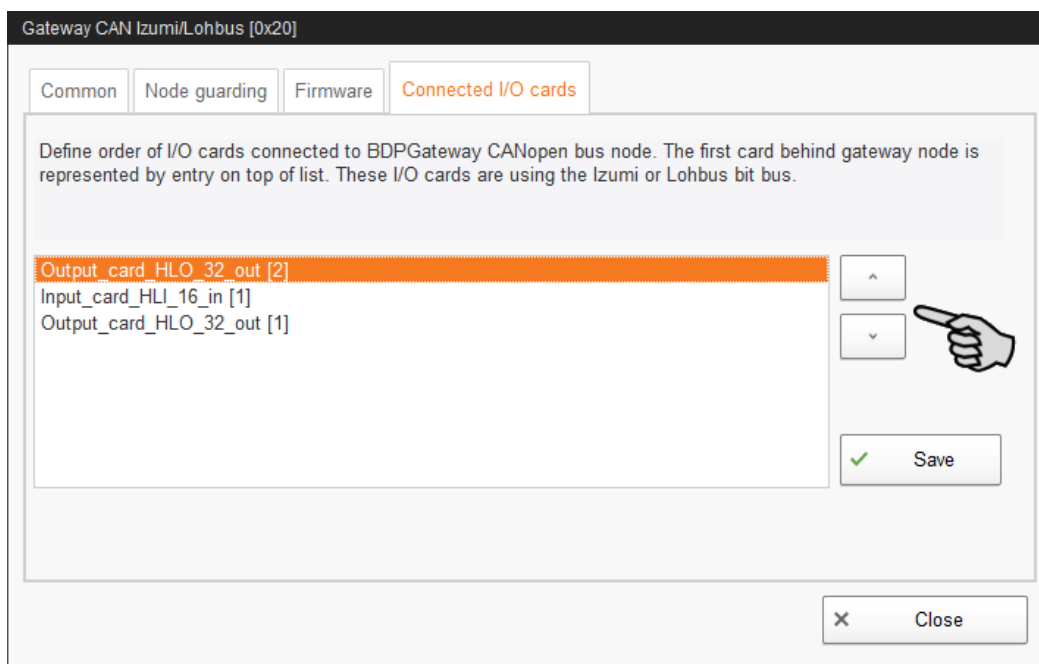


3. Click on the tab "Connected I/O cards".



4. Sort the IO cards that appear in the small view window:
 - a) Click on one IO card.
 - b) Change the position of the IO card using the arrows pointing upwards and downwards.

	Number the IO cards consecutively, starting with the first card behind the gateway when sorting the IO cards.
---	---



- c) Save the defined order by clicking on "Save".
5. Close the dialog window for settings by clicking on the button "Close".

2.4.2 Creating links

Link the different devices manually with the corresponding IO card. The system currently does not support the "Default mapping" function (button).

1. Change one or more inputs to outputs with the supply voltage +24 V in the "Channel" area, where necessary.

In the preset, only inputs are shown at first.

This function is only possible for BDDIO32 IO cards.

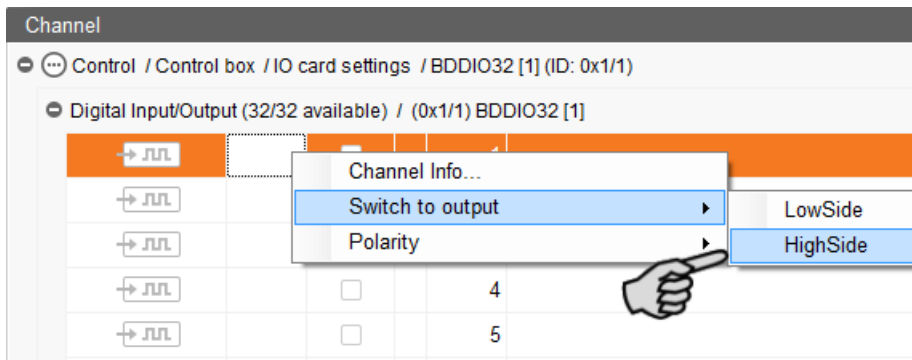
- a) Select one input or select multiple inputs by holding the Ctrl key.

Multiple editing is only possible for channels of the same type.

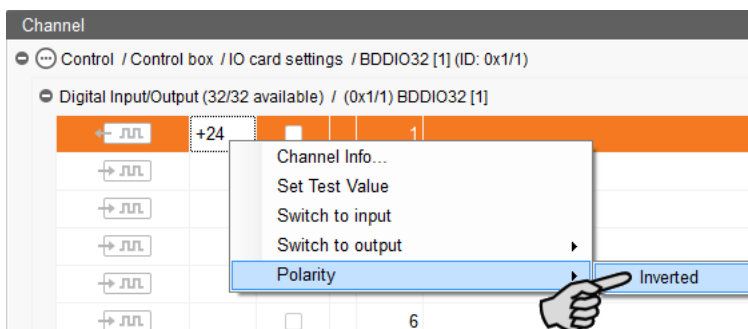
- b) Right-click into the marked area.
- c) In the context menu, select "Switch to output" > "HighSide", if the new output should switch to high side (24 V).

Or:

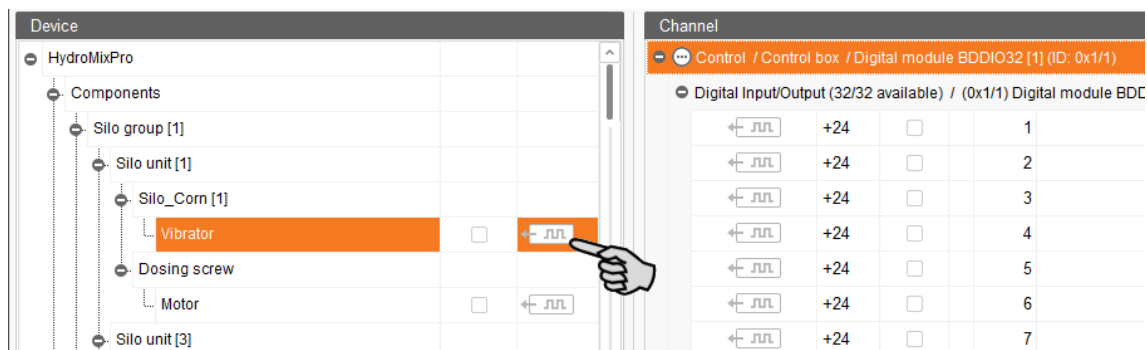
In the context menu, select "Switch to output" > "LowSide", if the new output should switch to low side (ground).



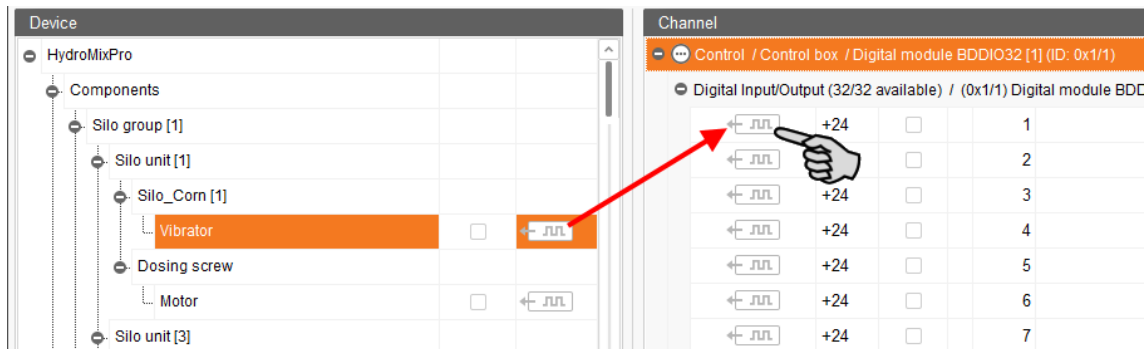
- d) If necessary, you can invert the polarity of the signal by clicking on "Polarity" > "Inverted" in the context menu.



2. In the "Device" part of the window, click on the linking icon of the system component and hold the mouse button.

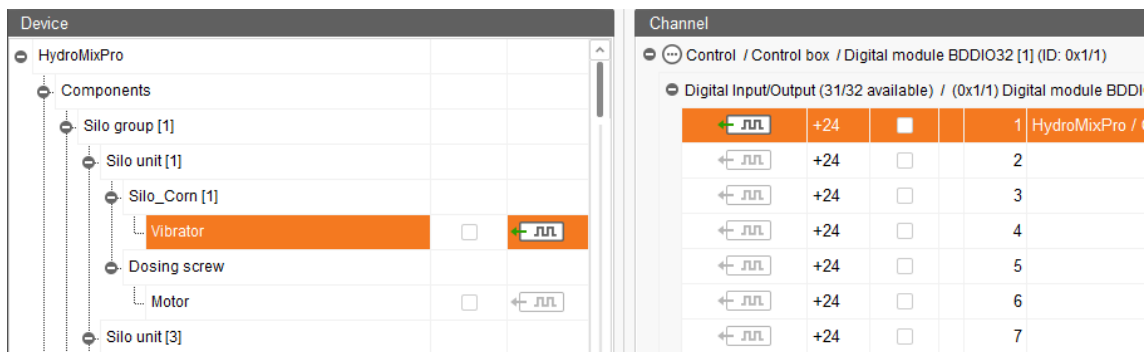


3. Drag the mouse to the linking icon of the desired channel in the "Channel" part of the window on the right.




4. Release the mouse button.

The system component and the channel are now linked.



5. If you have created an incorrect link, right-click on the corresponding linking icon. Click on "Delete connection" in the context menu.



Checking links:

Double-click on the respective device to mark the linked channel.

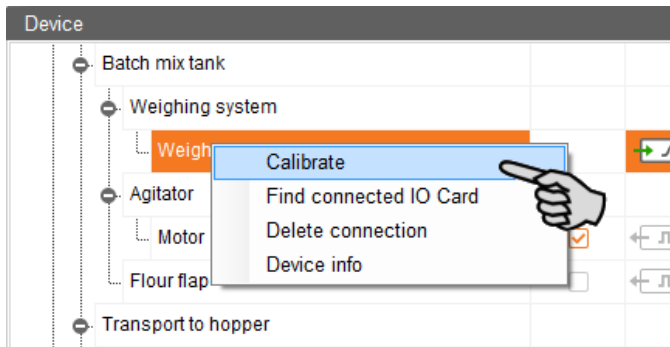
6. Click on "Save" in the bottom command bar after having established all links.
7. Click on "Restart application" in the bottom command bar to start the control.

2.4.3 Calibrating scales

As soon as you have created a link between the weighing bars and the respective weighing box, you can calibrate the mixing tank's scale.

1. In the "Device" area, right-click on "Weighing bar".
2. In the context menu, click on "Calibrate".

This opens a new dialog window.



3. In the section "Values to calibrate the start and end points", define the corresponding values.

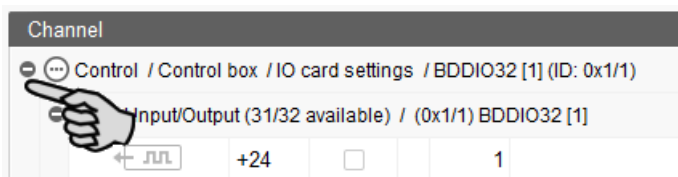
- a) Enter the value "0" in the input field next to "Start weight" and click on "Set".
- b) Enter the used calibration weight into the input field next to "End weight".
We recommend using half the hopper weight.
- c) Put the calibration weight on the scale.
- d) Click on "Set" in the row with the end weight.

4. Accept your inputs by clicking on "OK".
5. Click on "Close" to complete the calibration process.

2.4.4 Changing CAN addresses

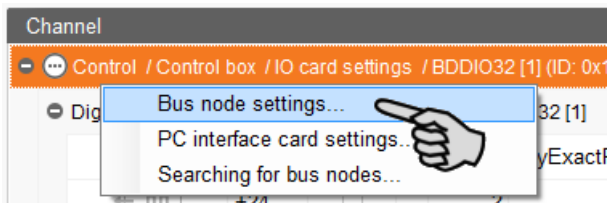
Please refer to the enclosed wiring diagrams for information on the device's CAN addresses. Assign the CAN addresses in accordance with the wiring diagram.

1. On the IO cards to be assigned, check to which CAN ID the rotary switch of each card is set (in the control box).
2. For an overview of the available IO cards, close the opened structure by clicking on the minus icon.

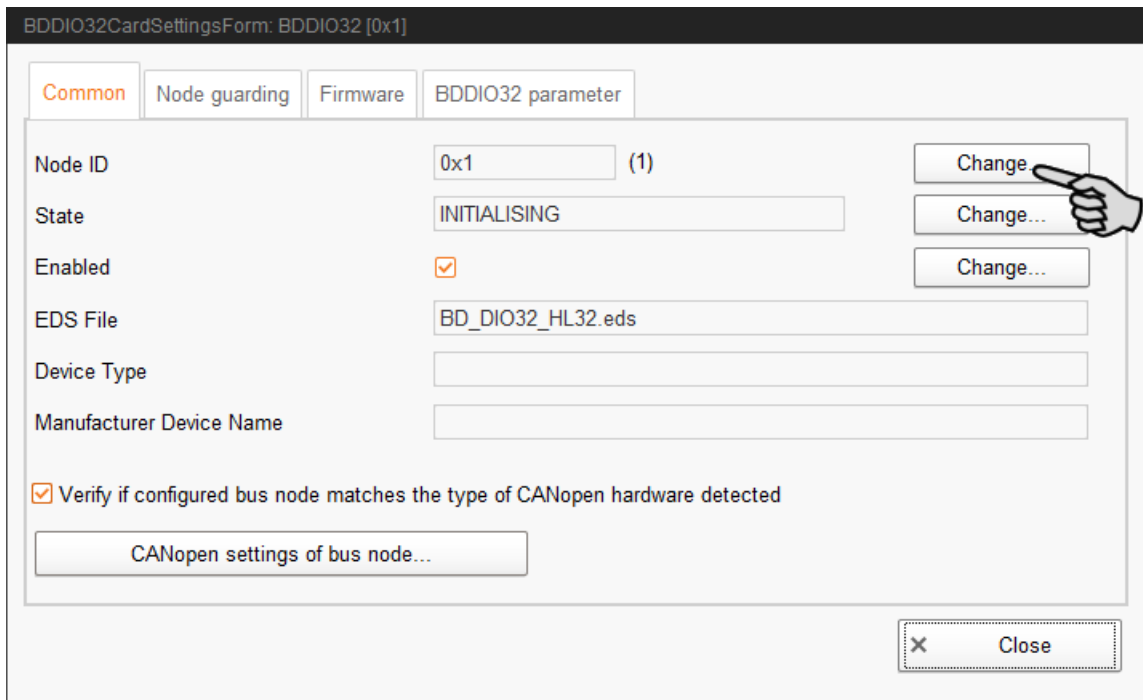


3. Right-click on the IO card whose CAN address you want to change.
4. Click on "Bus node settings" in the context menu.

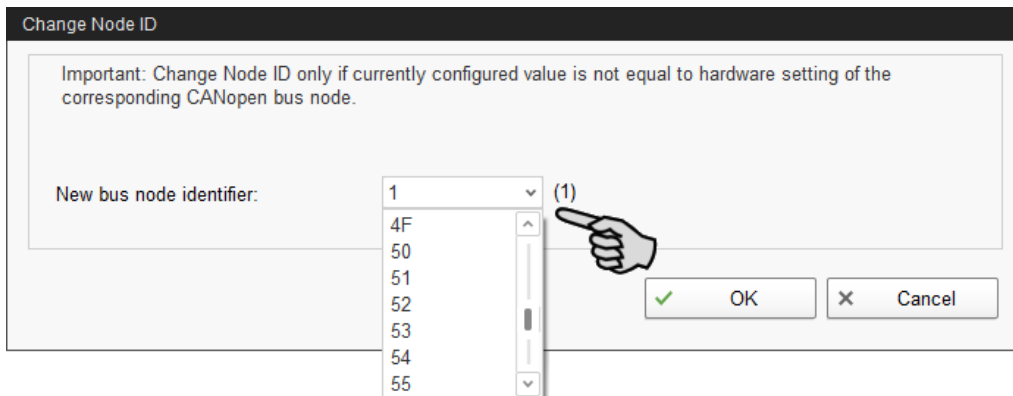
This opens a new dialog window with the settings.



- In the first tab, click on "Change..." next to "Node ID".



- Make sure that ID 61 is selected under "New bus node identifier".



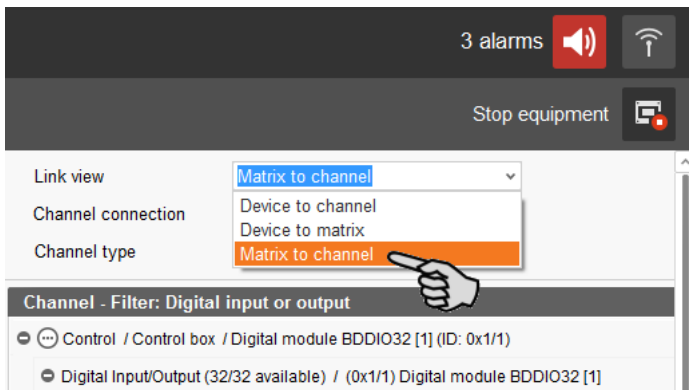
- Click on "OK".
- Confirm these inputs in the next window by clicking on "Yes".
- Close the dialog window for settings by clicking on the button "Close".

2.4.5 Creating a valve matrix

The digital modules BDDIO32 and BDDIO32LC can control the feed valves. In total, 32 channels are available, and the IO Manager can be used to configure each channel as either input or output. The outputs can be switched to either +24 V or to GND, depending on the configuration. This makes it possible to realise a valve matrix for the actuation of the feed valves. A valve matrix can control a maximum of 220 valves per digital module.

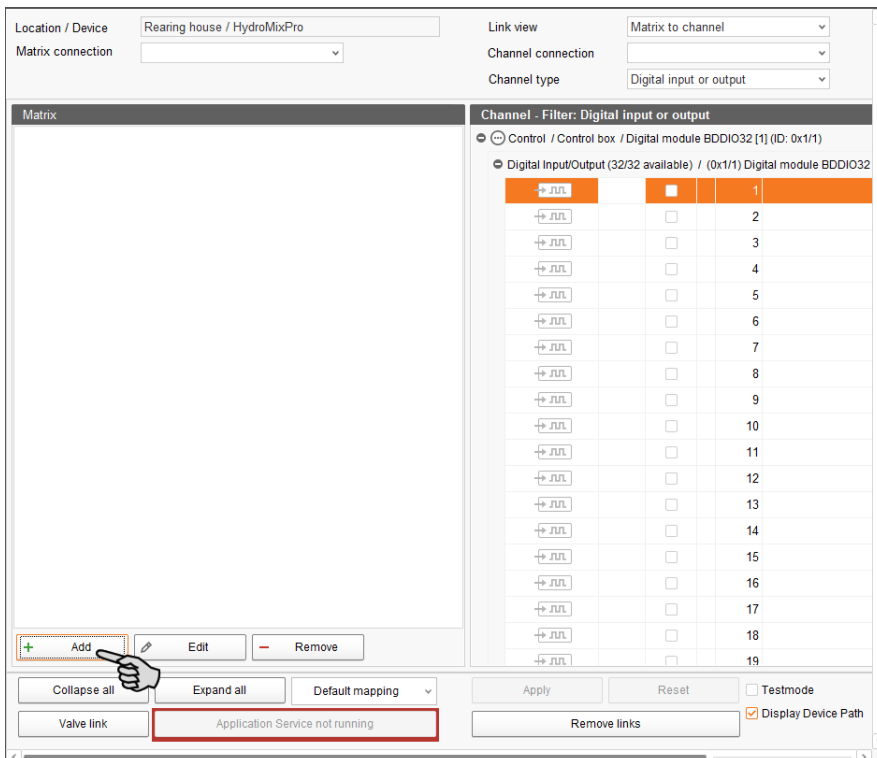
1. In the upper area, select the view "Matrix to channel".

The application window is divided into matrix (on the left) and channel (on the right).



2. In the matrix area, click on "Add".

This opens the dialog window "Matrix".



3. Define the matrix and generate the matrix dimension based on the feed valves to be controlled:
 - "Type": Valve matrix
 - "Name" of the valve matrix: freely selectable
 - "Dimensions" > "Group": 5 (exemplary value)
 - "Dimensions" > "Single": 10 (usually matrices of 10)

The screenshot shows a dialog box titled "Matrix" with the following fields and values:

- Number: 1
- Type: Valve matrix
- Name: 123
- Dimensions:
 - 100 er Group: 0
 - Group: 5
 - Single: 10

Buttons: OK, Cancel

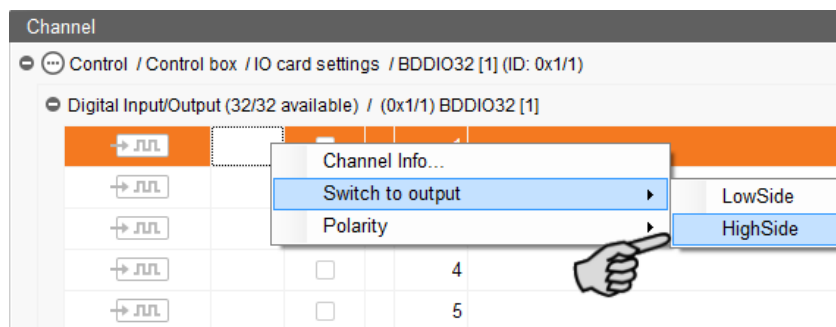
4. Accept these inputs by clicking on "OK".

The group outputs and the single outputs are shown on the left in the area "Matrix".

5. Define the outputs +24 V and GND on the right in the area "Channel". Potentials for the group outputs and single outputs must be opposed.
 - a) Select one input or select multiple inputs by holding the Ctrl key.
Multiple editing is only possible for channels of the same type.
 - b) Right-click into the marked area.
 - c) In the context menu, select "Switch to output" > "HighSide", if the new output should switch to high side (24 V).

OR:

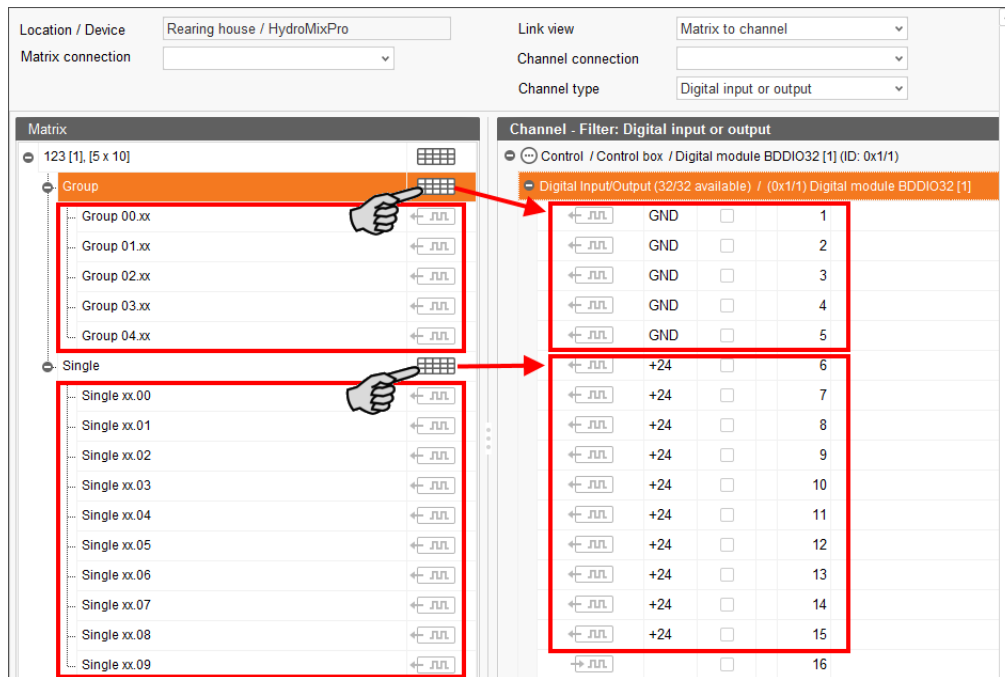
In the context menu, select "Switch to output" > "LowSide", if the new output should switch to low side (ground).



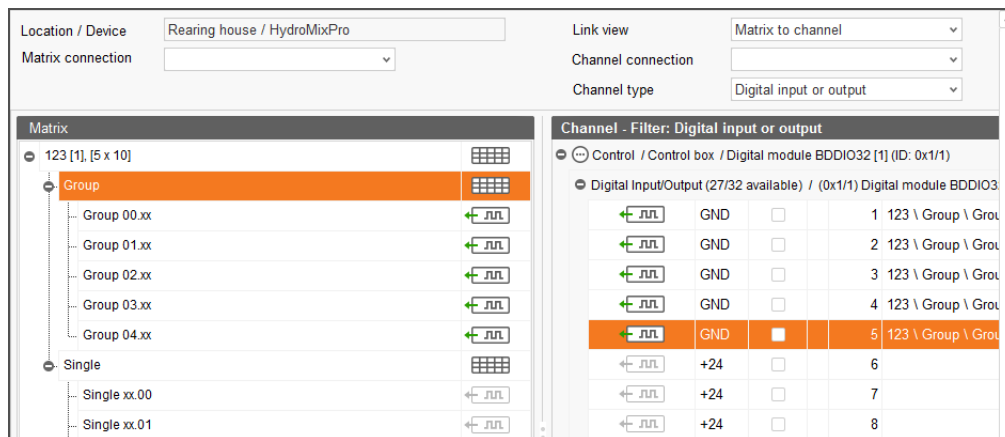
6. Link the group outputs and single outputs in the area "Matrix" with the corresponding outputs in the area "Channel":
 - a) Create each link individually, see point 2, chapter 2.4.2 "Creating links".

OR:

Use multiple linking by clicking on the matrix icon and dragging it to the **first** linking icon of the corresponding output group.



The links are thus created all at once, one after another.

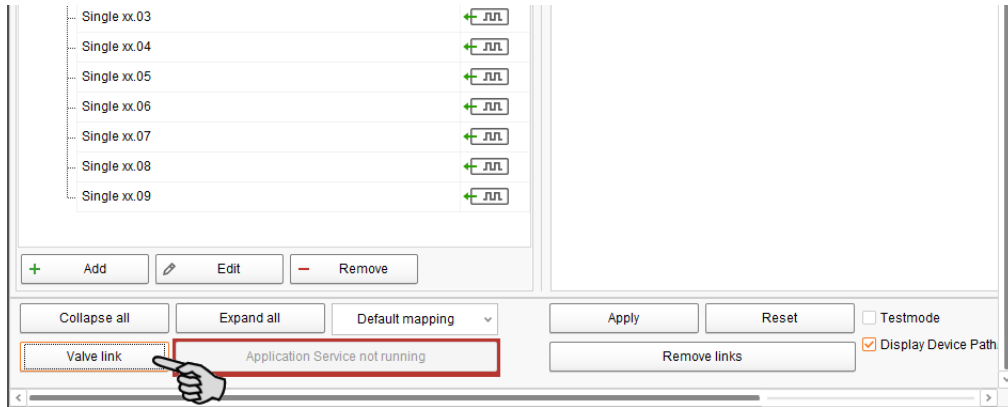


7. Click on "Save" in the lower command bar to save the settings.

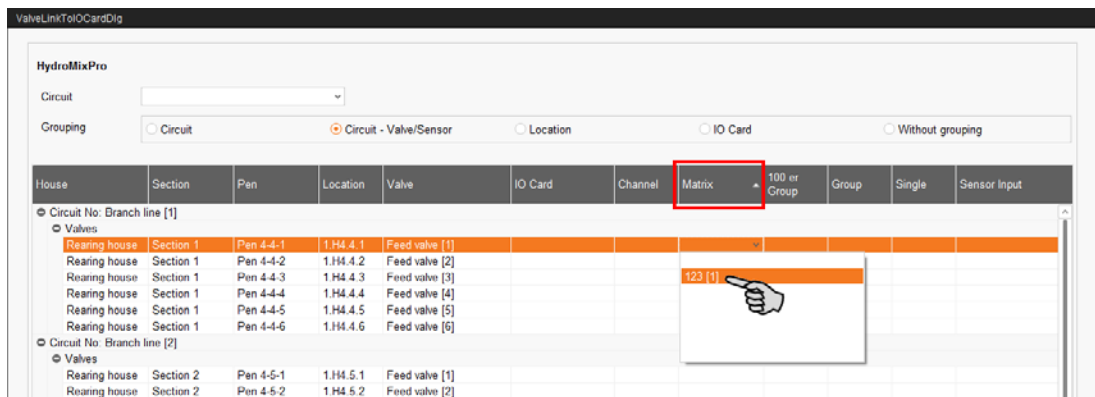
8. Define the valve link:

- a) Click on "Valve link" in the lower command bar.

This opens the dialog window "Valve links".

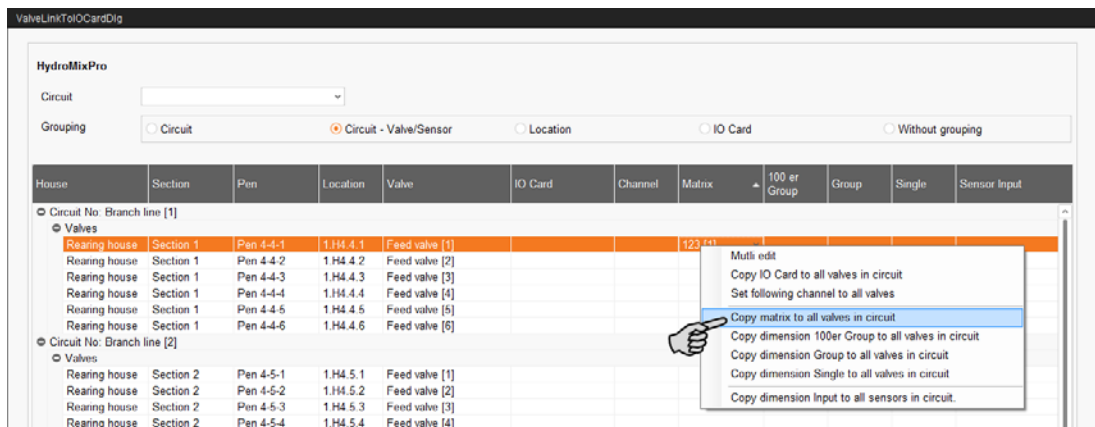


- b) Assign the valves in the column "Matrix" to the created matrix by clicking into the input field and selecting the correct matrix.



- c) As soon as you have assigned the first valve to a matrix, you can multi-edit the other valves:

Right-click on the selected matrix to open the context menu and select "Copy matrix to all valves in circuit".

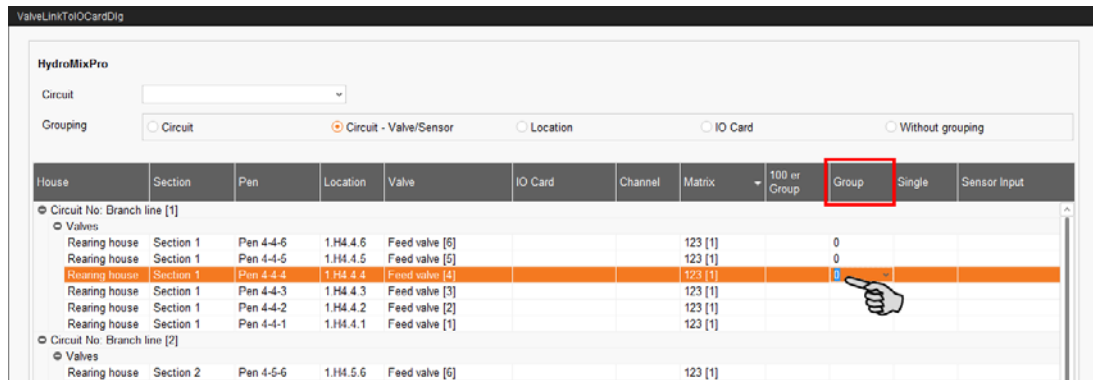


- d) Assign the valves in the column "Group" to one each of the created group outputs:

Click into the input field and enter the number using your keyboard.

OR:

Click on the arrow pointing downwards and select the number from the list.

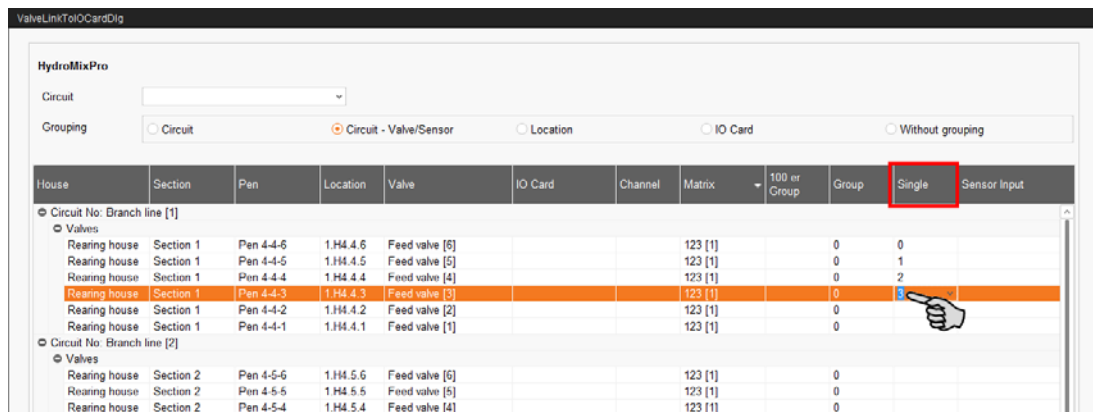


- e) Assign the valves in the column "Single" to one each of the created single outputs:

Click into the input field and enter the number using your keyboard.

OR:

Click on the arrow pointing downwards and select the number from the list.



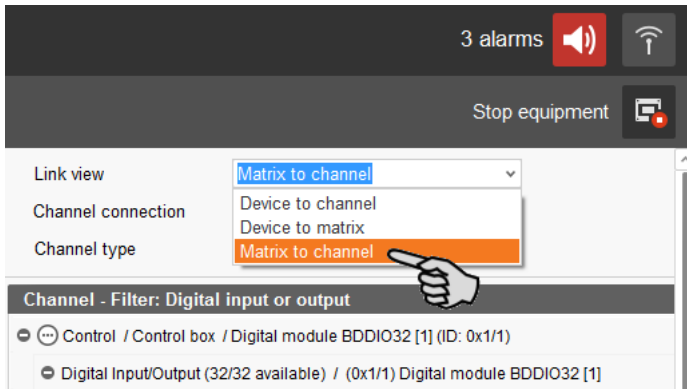
9. Click on "Save" to save all settings.

2.4.6 Creating a sensor matrix

In case of sensor feeding, the sensor installed in the trough reports whether the trough is empty or not empty. You can create a sensor matrix to read the sensor inputs.

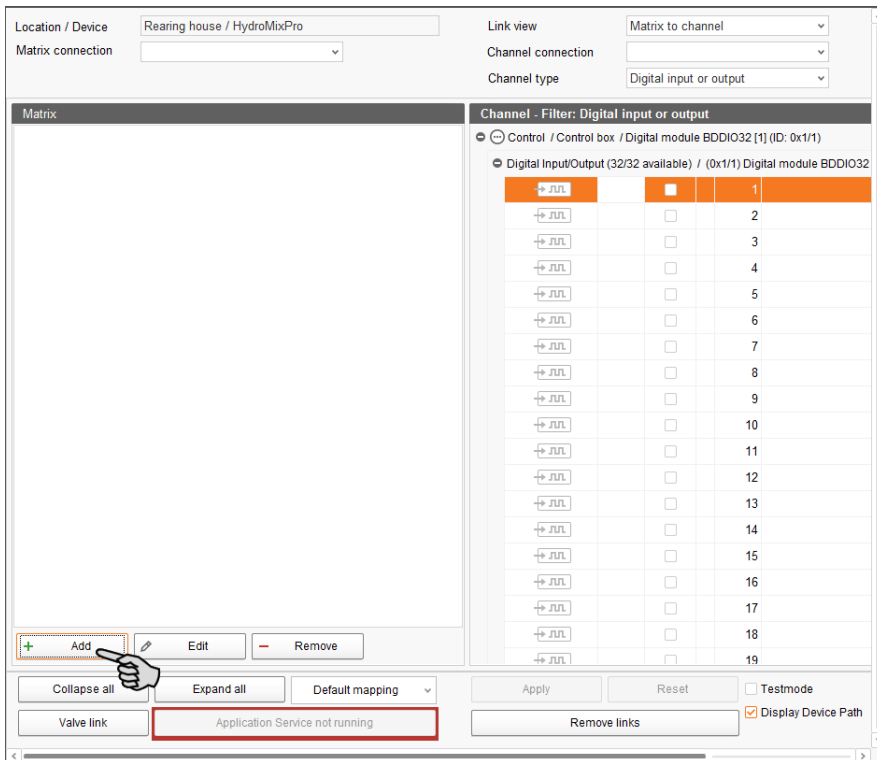
1. In the upper area, select the view "Matrix to channel".

The application window is divided into matrix (on the left) and channel (on the right).



2. In the matrix area, click on "Add".

This opens the dialog window "Matrix".

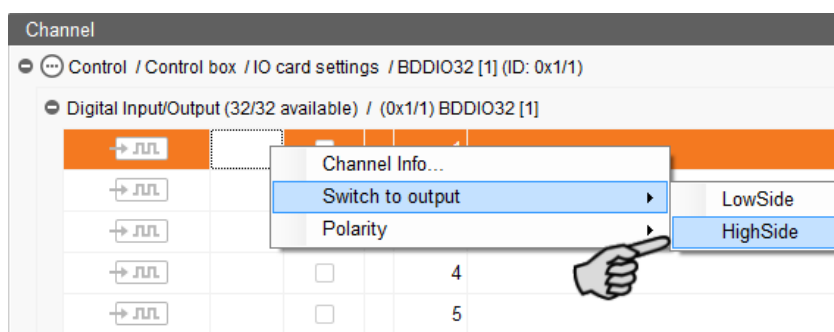


3. Define the matrix and generate the matrix dimension based on the sensor inputs to be read:
 - "Type": Sensor matrix
 - "Name" of the sensor matrix: freely selectable
 - "Dimensions" > "Group": 5 (exemplary value)
 - "Dimensions" > "Input": 10 (usually matrices of 10)

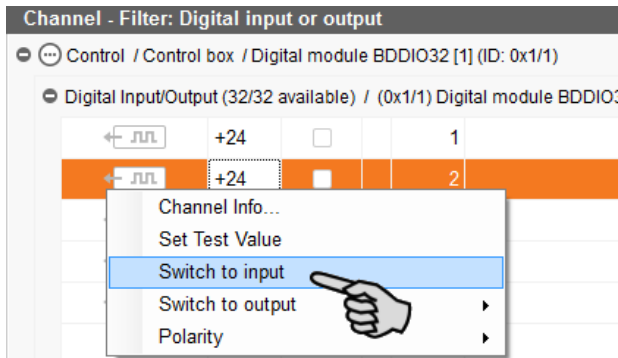
The screenshot shows a dialog box titled "Matrix". It contains the following fields and values:

- Number: 1
- Type: Sensor matrix (dropdown menu)
- Name: 123
- Dimensions section:
 - 100 er Group: 0
 - Group: 5
 - Input: 10
- Buttons: OK (with a green checkmark icon) and Cancel (with a red X icon).

4. Accept these inputs by clicking on "OK".
The group outputs and the sensor inputs are shown on the left in the area "Matrix".
5. Define the outputs +24 V for the groups on the right in the area "Channel".
 - a) Select one input or select multiple inputs by holding the Ctrl key.
Multiple editing is only possible for channels of the same type.
 - b) Right-click into the marked area.
 - c) Select "Switch to output" > "HighSide" (+24 V) in the context menu.



6. Change existing outputs to inputs in the "Channel" area, where necessary.
 - a) Select one output or select multiple outputs by holding the Ctrl key.
Multiple editing is only possible for channels of the same type.
 - b) Right-click into the marked area.
 - c) Select "Switch to input" in the context menu.

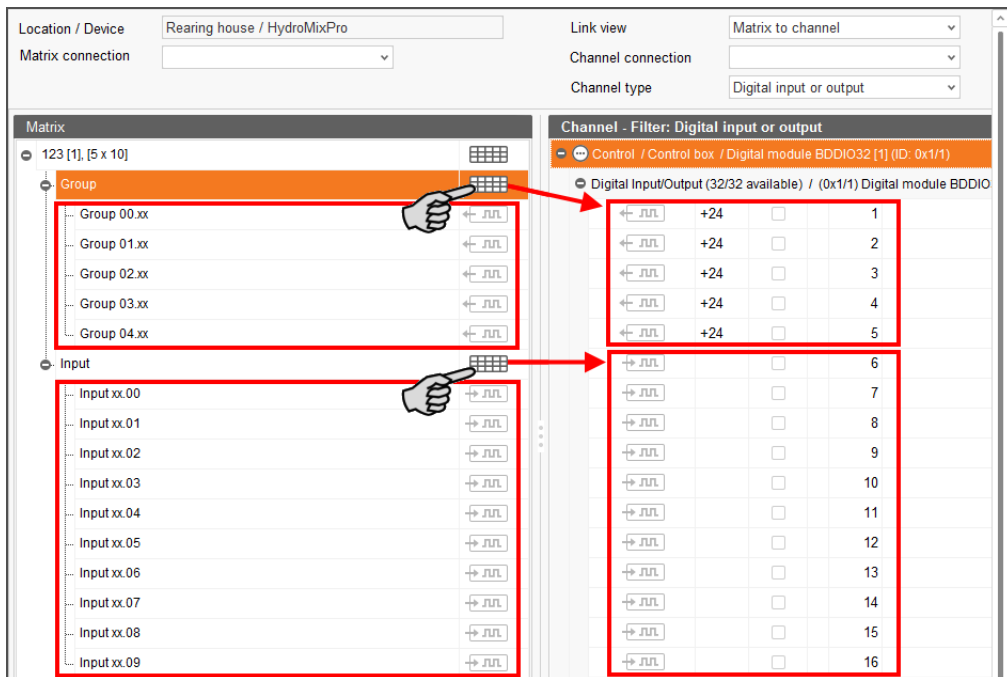


7. Link the group outputs and the sensor inputs with the corresponding channels in the area "Matrix".

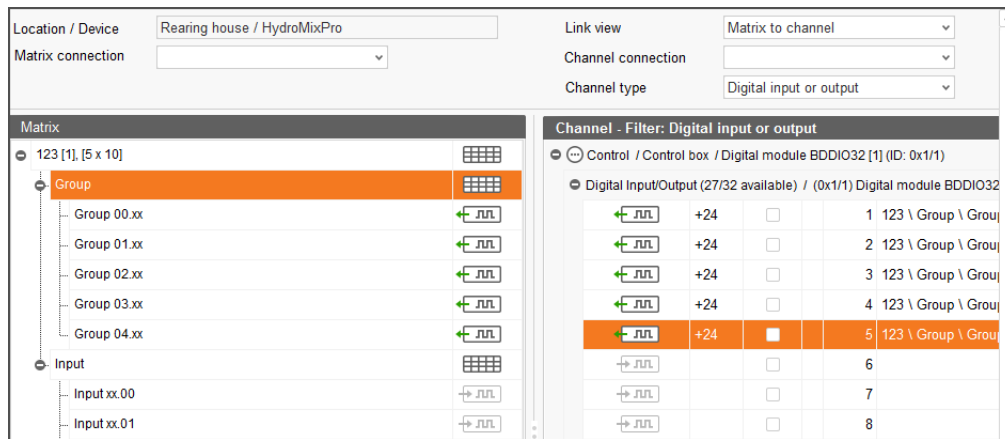
a) Create each link individually, see point 2, chapter 2.4.2 "Creating links".

OR:

Use multiple linking by clicking on the matrix icon and dragging it to the **first** linking icon of the corresponding channel group.



The links are thus created all at once, one after another.

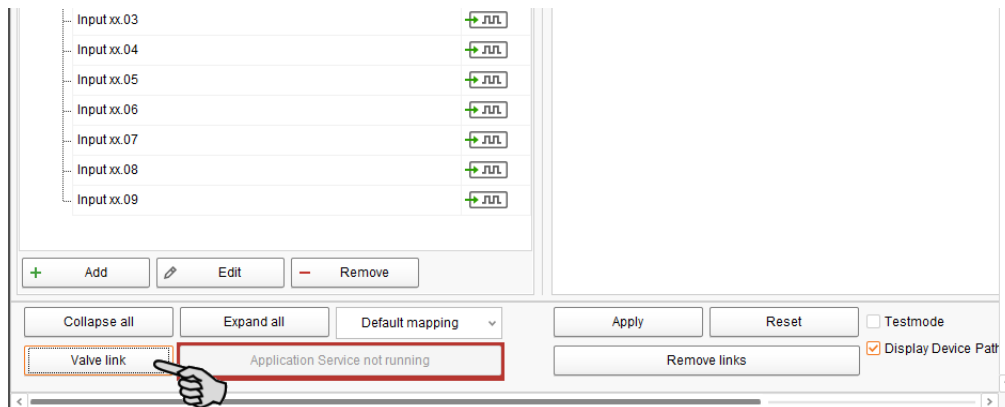


8. Click on "Save" in the lower command bar to save the settings.

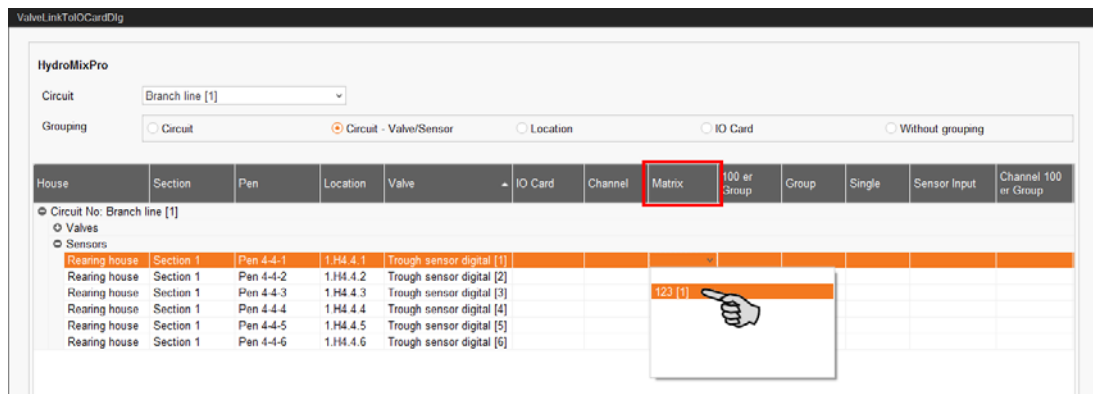
9. Define the valve link:

a) Click on "Valve link" in the lower command bar.

This opens the dialog window "Valve links".

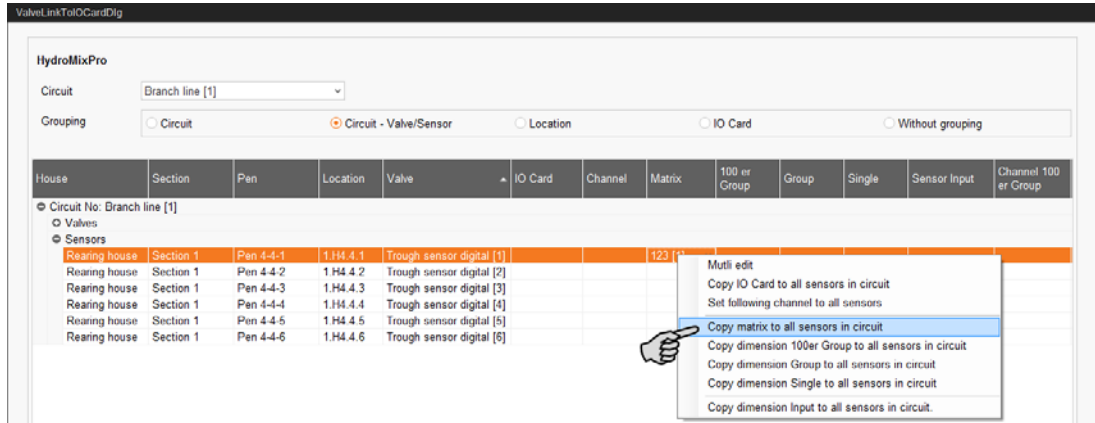


b) Assign the sensors in the column "Matrix" to the created matrix by clicking into the input field and selecting the correct matrix.



- c) As soon as you have assigned the first sensor to a matrix, you can multi-edit the other sensors:

Right-click on the selected matrix to open the context menu and select "Copy matrix to all sensors in circuit".

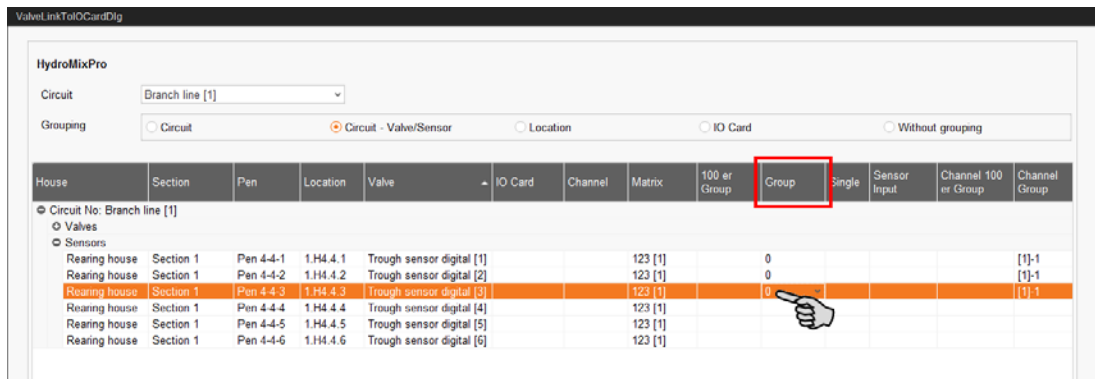


- d) Assign the sensors in the column "Group" to one each of the created group outputs:

Click into the input field and enter the number using your keyboard.

OR:

Click on the arrow pointing downwards and select the number from the list.

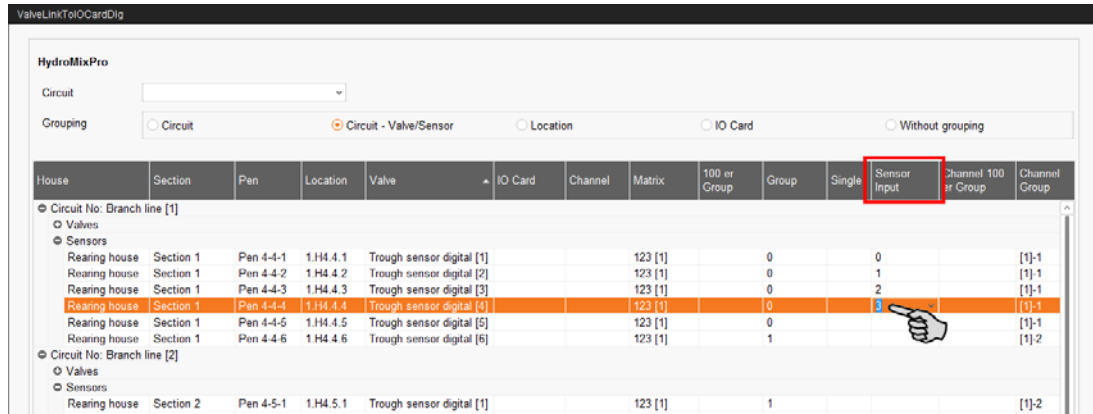


- e) Assign the sensors in the column "Sensor input" to one each of the created sensor inputs:

Click into the input field and enter the number using your keyboard.

OR:

Click on the arrow pointing downwards and select the number from the list.



- 10. Click on "Save" to save all settings.

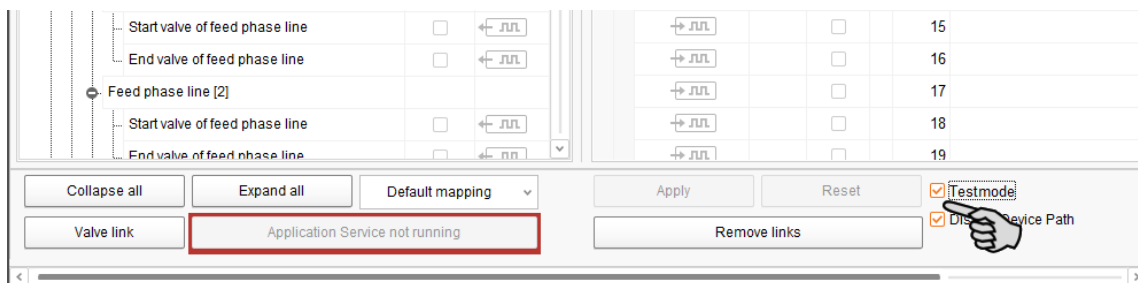
2.4.7 Using the test mode

In the test mode of the IO Manager, all devices can be turned on and off to check the correct setup of the control before starting to operate the system.

Proceed as follows:

Only service technicians may use the test mode. Devices may start in case the system is connected.

- 1. Check the "Test mode" box in the bottom command bar.



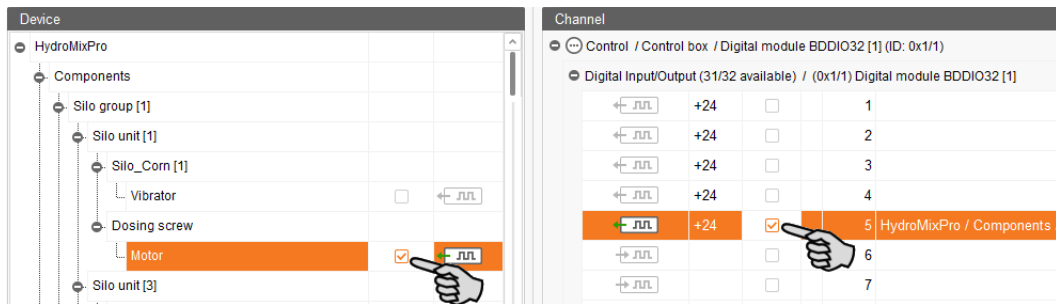
- 2. In the "Device" part of the window, double-click on the linking icon of the device you want to turn on.

This marks the linked channel in the "Channel" part of the window on the right.

- Click on the check boxes of the selected device and respective channel to activate them.

The device is now turned on.

If the device is not linked or if another device turns on instead, correct the link in the IO manager or reset the outputs of the IO card. Always refer to the overview drawing of the IO card attached to the wiring diagram.



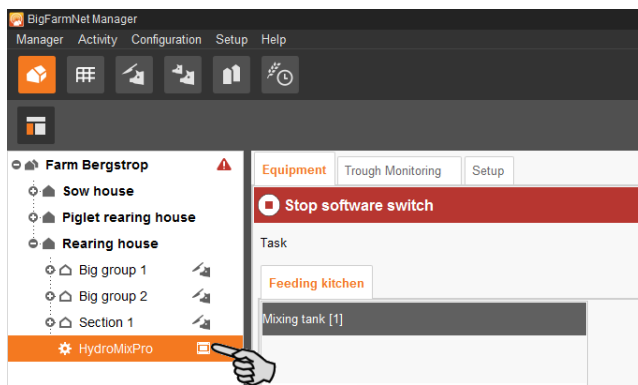
- Turn off the device by deactivating the check box.
- Exit the test mode by deactivating the check box "Test mode" in the bottom command bar.

2.5 Manually controlling the system components

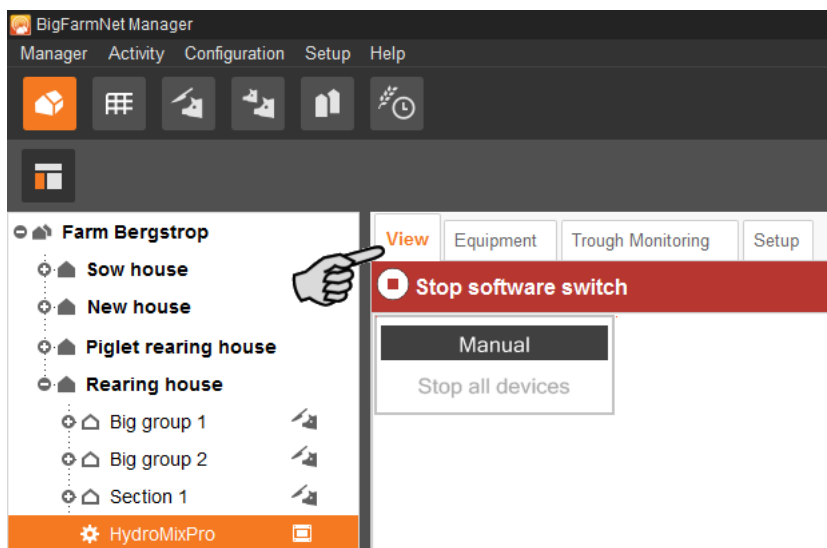
As soon as you have created your system in the FeedMove Editor (chapter 2.3 "Depicting the system in the FeedMove Editor"), the tab "View" is added to the application window.

The system usually runs automatically, based on the configured settings. From the "View" tab, you can operate the system manually with the BigFarmNet Manager. This means that you can manually activate or deactivate individual system components and their elements.

1. In the farm structure, click on the controller icon of the system you want to edit.



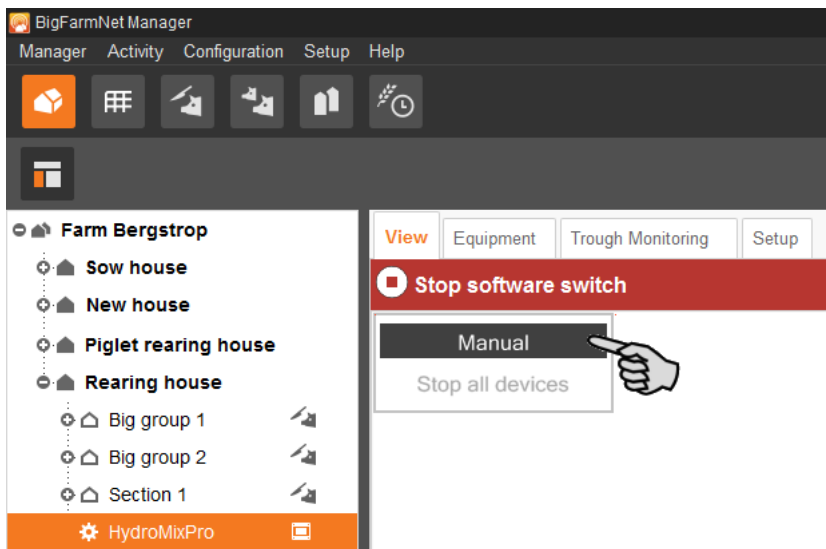
2. Click on the "View" tab.



3. If necessary, adjust the view or retrieve one of your saved views using the camera icons, see chapter 2.3.4 "Adjusting and saving views", page 21.

4. Click on "Manual" in the upper left corner.

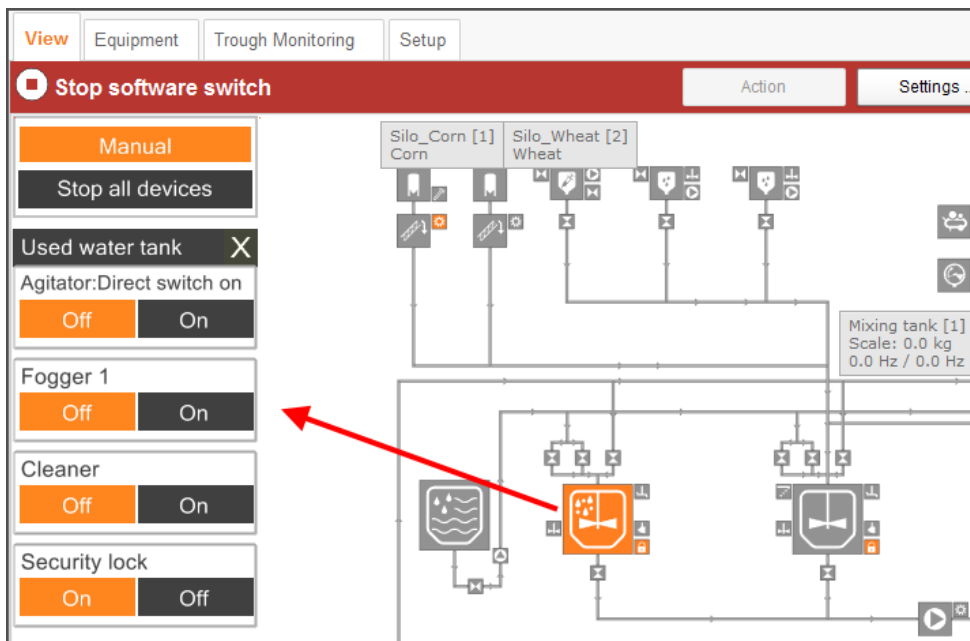
Manual control is now active.



5. You can manually switch on or off functions of the system components as follows:

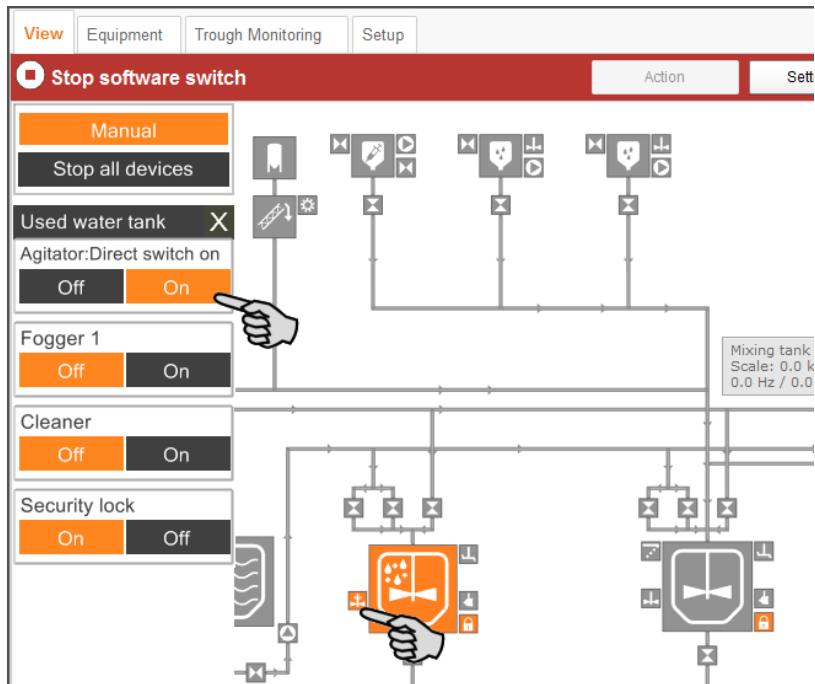
- a) Click on the respective system component.

The colour of the system component changes to orange. The elements belonging to this component are displayed in the window to the left.



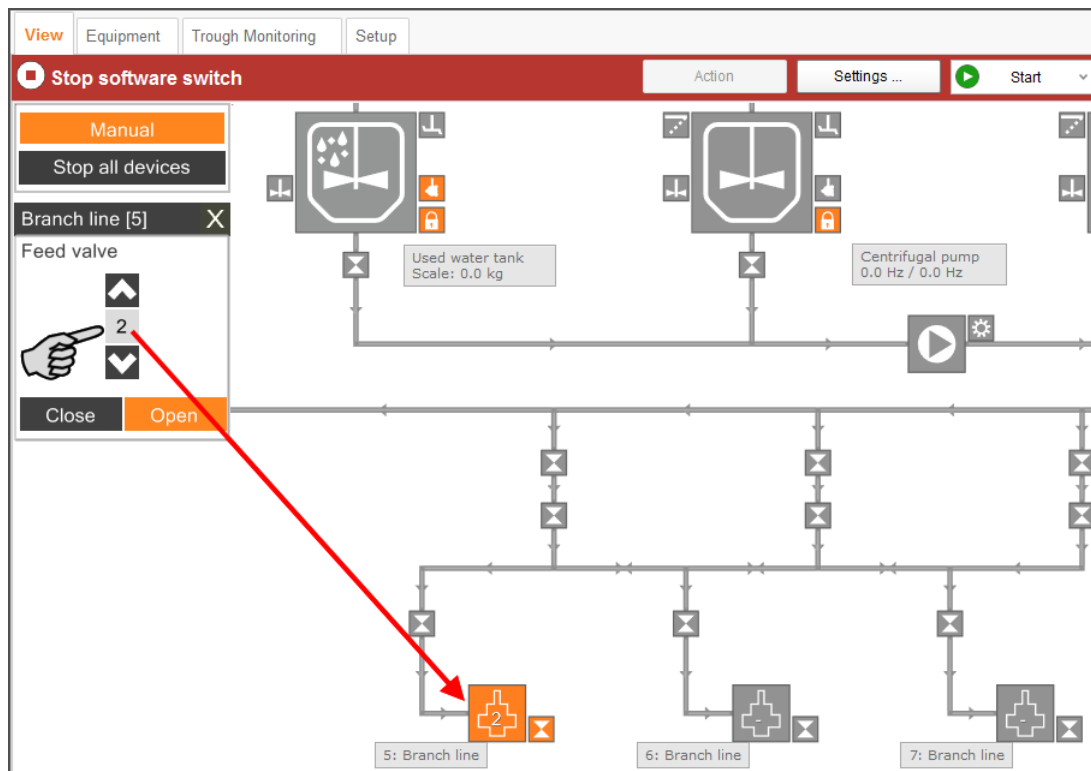
- b) Activate or deactivate the required element in the window to the left or by clicking directly on the element icon in the view.

Active elements are orange. Inactive elements are gray.



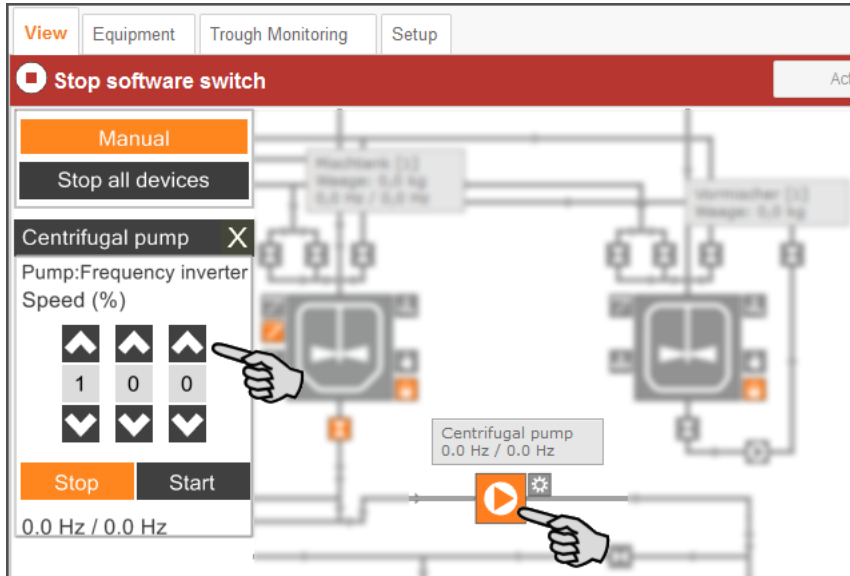
- c) If you want to open or close a specific valve in a circuit, select the respective valve using the arrows pointing up and down.

The selected valve is shown in the selected feed circuit in the view.



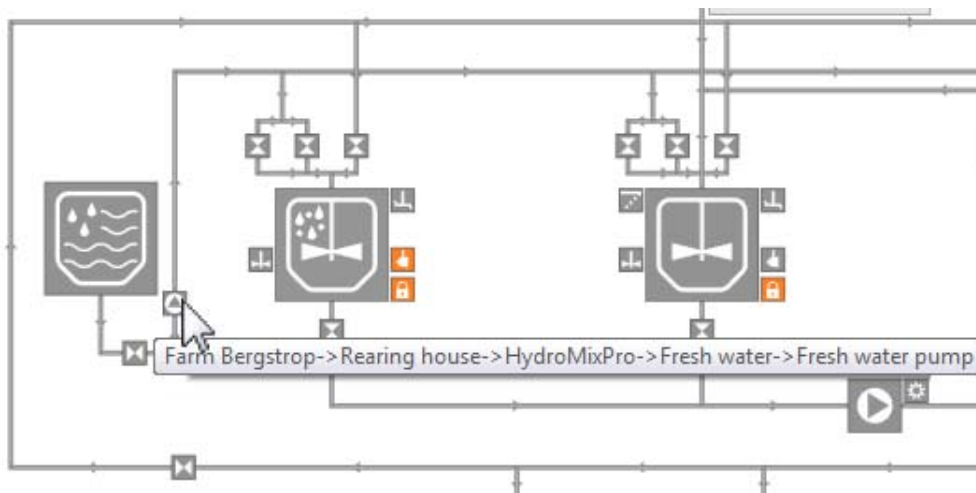
6. Change the frequency of a system component that is controlled by a frequency inverter, e.g. an agitator or a pump, if necessary.

Click on the respective system component and change the frequency using the arrows pointing upwards and downwards.



- d) You may control all elements manually in this manner.

To see the entire name of the function or the system component, move the mouse pointer over the different icons in the view. A tooltip shows the full name.



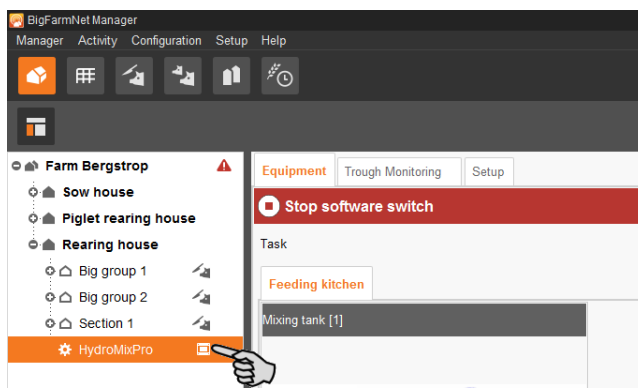
7. Stop manual control by clicking on "Manual" again.

2.6 Manual actions for the feed moves

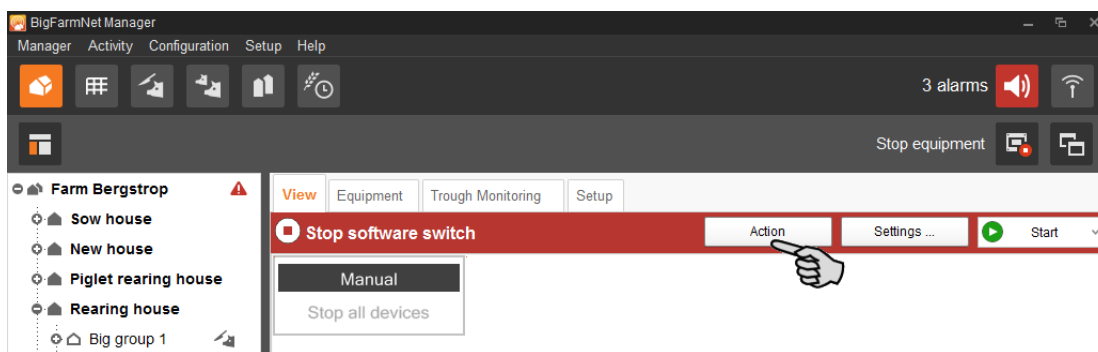
As soon as you have created your system in the FeedMove Editor (chapter 2.3 "Depicting the system in the FeedMove Editor"), the tab "View" is added to the application window.

The system usually runs automatically, based on the configured settings. You may access individual feed moves below the tabs "View" and "Equipment" and carry out manual actions, e.g. pumping fresh water into the mixing tank or moving feed from the mixing tank into a branch line. Manual actions can be defined for multiple feed moves. These actions are then carried out one after another in the desired order.

1. In the farm structure, click on the controller icon of the system you want to edit.



2. Click on the "Action" button in the "Equipment" or "View" tab.
This opens the dialog window "Manual action".



3. In the upper area, enter the "Source" and the "Target" of the respective feed move and select the feed move from the list.

Manual action

Filter

Source: Fresh water tank Target: Mixing tank [1] Passed circuit: Don't care

Feed move

- Fresh water tank - Mixing tank [1] (over Cleaning valve mixing tank)
- Fresh water tank - Mixing tank [1] (over Filling valve mixing tank)

End condition

Weight Volume Sensor is activated Duration

Duration: 0 s

Weight: 0.0 kg

Volume: 0 l

Valve: [dropdown]

Pump speed: 0 % Auto

Until sensor is activated:

Agitator speed

Source bin: [dropdown] Target bin: Fast

Add Remove Remove all

Active feed move:

4. In the central area under "End condition" and "Agitator speed", configure the temporary setting.

Depending on the feed move and the installed system components, the corresponding parameters for the action become active, for example:

- "Sensor is activated" only applies to jet branch lines or if the minimum sensor is installed.
- "Volume" only applies if a flow meter is installed.
- The button "<= Until minimum weight" is the value of the parameter "Minimum amount" for each tank, e.g. mixing tank, pre-mixer, etc. This value is entered in the application settings, see chapter 3 "Configuration of the HydroMixpro application", page 62.

If you click on this button, the system turns off as soon as the minimum weight has been reached.

5. Click on "Start" in the lower command bar to start the action for the selected feed move immediately.

OR:

Click on "Add" in the lower area if you want to add actions for other feed moves.

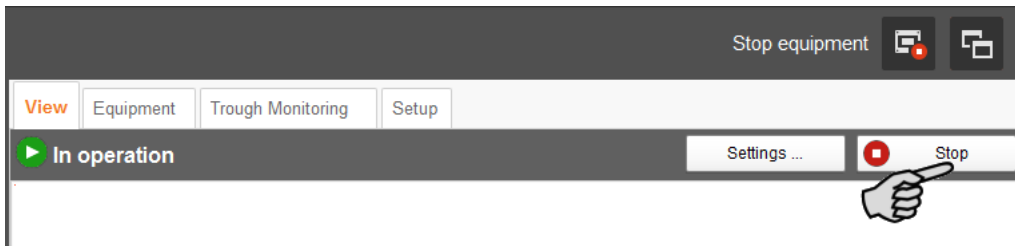
Feed moves with defined actions are listed in the field on the right. Use the arrows pointing upwards and downwards to sort the actions in the correct order for execution.



6. Click on "Close" in the lower command bar to close the dialog window.

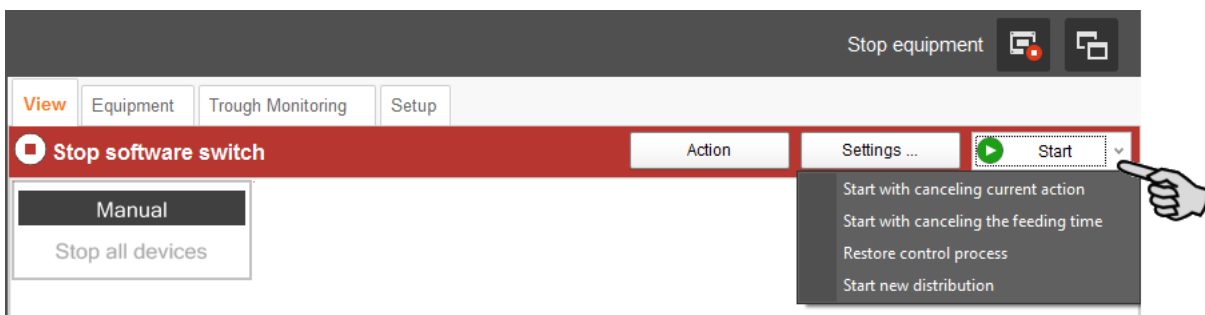
2.7 Stopping the system and canceling an action

You may stop the system during operation by clicking on "Stop" in the right-hand corner of the upper bar in the tab "View" or "Equipment". If you click on "Start" again, the system continues to operate with the current action or task.



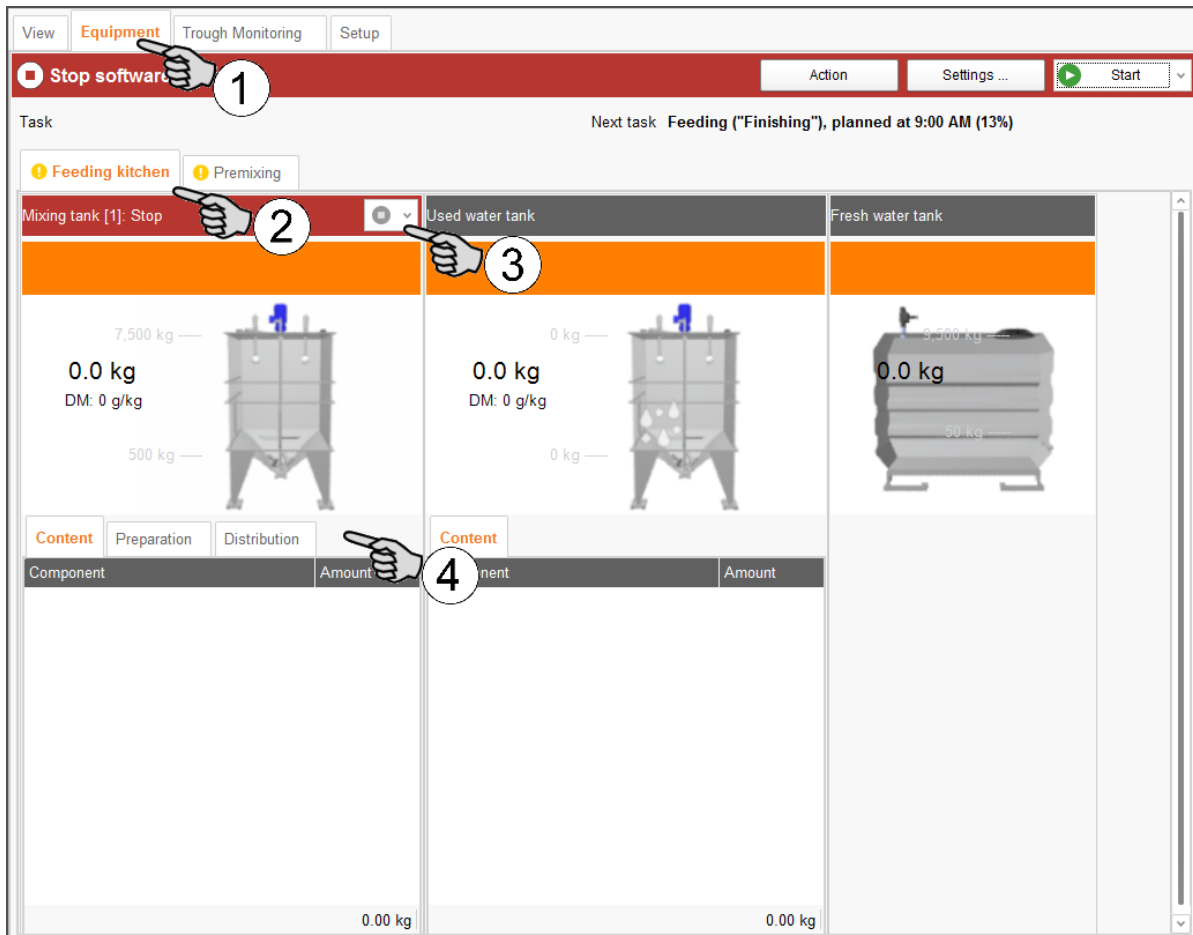
However, if you do not want to continue the current action, start the system again as follows:

1. Click on the arrow pointing downwards next to the "Start" button" and select the correct option from the context menu.
 - **Start with canceling current action:** The system starts, cancels the current action and continues with the next action. For example, the waiting time for a block feeding will be ignored.
 - **Start with canceling the feeding time:** The system starts and cancels the current task, e.g. feeding or cleaning.
 - **Restore control process:** In case of control errors of the BigFarmNet Manager, use this option to restart the entire system including all processes.
 - **Start new distribution:** Select this option if you want the redistribute the currently (manually) mixed feed in the mixing tank. Select the new feed valves in the dialog window that opens next.



2.8 Views in the "Equipment" tab

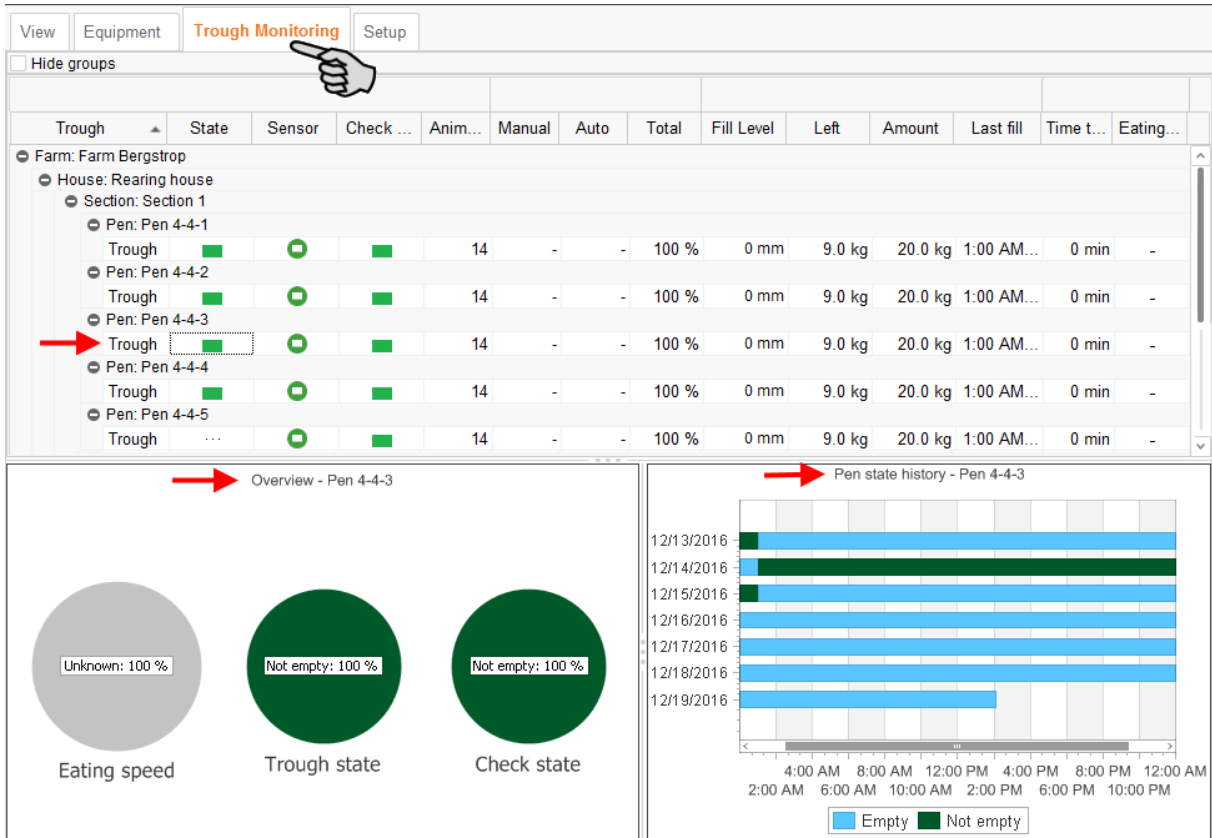
The system components of the feed kitchen and the pre-mixer are displayed in the "Equipment" tab based on the configured system. This is simply a view without any options to configure settings. The only possible action is stopping the mixing tank or the pre-mixer.



1. Click on the "Equipment" tab.
2. Switch the view between "Feeding kitchen" and "Premixing", if available.
3. Stop the mixing tank or the pre-mixer, if necessary.
4. Check the information given under the following tabs:
 - "Content" shows the components in the tank, including the amount.
 - "Preparation" shows the current preparation, including information on the currently available amount and the missing amount of the components.
 - "Distribution" shows for which valves preparation is active, including information on the target amount and the already distributed amount.

2.9 Trough monitoring

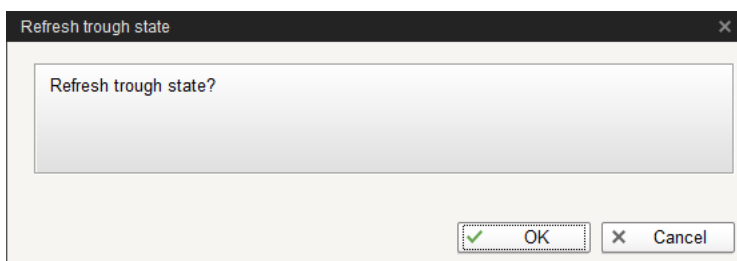
The trough monitoring provides information on the status of the sensor troughs (empty or not empty). This tab also has information on the eating speed, the eating time and the last feeding according to the sensor. The diagram in the lower right corner of the window shows the state history of the current day and the past six days.



Even though the trough status is checked regularly, you can also check the current trough status manually at any time:

1. Click on the state of the respective trough.

This opens the dialog window "Refresh trough state".



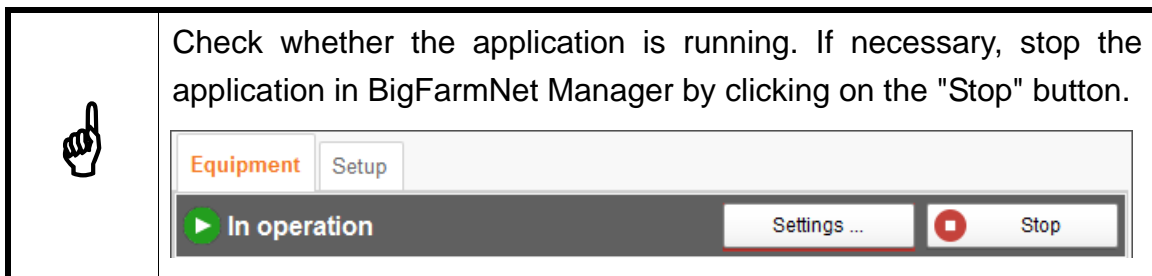
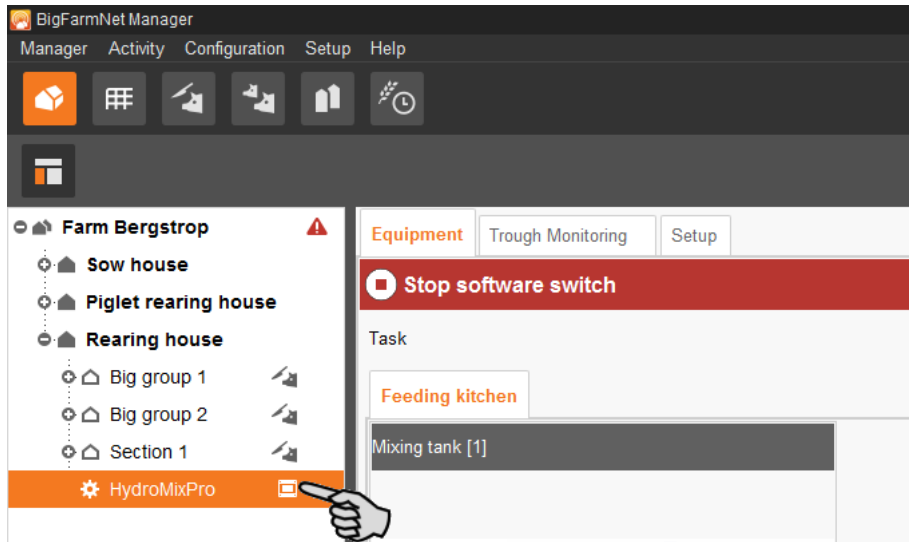
2. Confirm the dialog by clicking on "OK".

3 Configuration of the HydroMixpro application

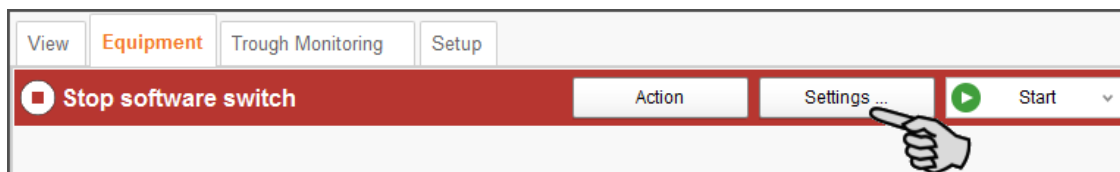
Settings regarding the application are configured under the "Equipment" tab. You may for example define the parameters for feed moves, feed distribution and dosing at the valves here. The setting parameters can be changed as required at any time.

Open the setting parameters as follows:

1. In the farm structure, click on the controller icon of the system you want to edit.



2. In the upper right corner under the "Equipment" tab, click on "Settings...".



The dialog window "Settings" with its multiple categories shows all parameters of the system component you created beforehand in the Composer. These parameters are described in the following chapters. Define the corresponding values for the parameters. Change pre-set values, if required.

3.1 General settings



- **Simulation**

Activate simulation: You need to restart the control process when you activate the simulation. The control process starts when you click on the button "Restart application" in the IO Manager. Mainly the scales, the sensors and the flow meters are simulated. For example, feeding or tank cleaning can be simulated without hardware.

When you deactivate the simulation, you need to restart the control again by clicking on the button "Restart application".

- **Distribution**

Time backlash dosing is the residual flow time for feeding. The system waits with closing the feed valve for this long so the scale can accept the correct value. The difference between the scale value at closing of the feed valve and the scale value after the end of the residual flow time is the residual flow volume. This amount is determined, adjusted and saved for each feed valve. During dosing, the feed valve is closed earlier corresponding to the stored residual flow volume so the desired amount is reached as exactly as possible after the residual flow time.

Time backlash moving is the residual flow time used to push the feed to a specific stop point (feed valve), see also "Time backlash dosing".

Time backlash water is the residual flow time for watering, see also "Time backlash dosing".

Allowable valve dosing error: If the percentage of "non-feed" (pushing component) of the dispensed amount is higher than the allowed dosing error, the system issues a warning.

- **Feed preparation**

Maximum dry matter: If this value is exceeded during filling of the mixing tank, an alarm is generated.

Additional feed: This amount is mixed in addition to the required amount for each feeding.

Agitator slow before off: When a component is conveyed into a mixing tank or a pre-mixer while the agitator is running (a setting for the component), the agitator mixes quickly at first. As soon as the remaining amount that still needs to be dispensed corresponds to the value given here, the agitator switches to a slower mode. If the value given here is greater than the total amount, the agitator mixes slowly from the beginning.

Warn below minimum preparation: If this box is checked, a warning is issued

- when the minimum preparation amount of the feed phases is too low. Feeding does not start.
- when the minimum mixing amount from the mixing tank settings is not reached.

Cleaning amount at end of preparation: If water is used as replacement component, the amount of water given here is dispensed by the cleaning valve after preparation. This requires that the amount is greater than the given minimum amount, see "Minimum cleaning amount at end of preparation".

Minimum cleaning amount at end of preparation: If the calculated percentage "Cleaning amount at end of preparation" is below this value, no water is dispensed by the cleaning valve after preparation.

Fill used water tank if needed: If this box is checked, the content of the mixing tank may be pumped into the used water tank before preparation if the requested dry matter content cannot be reached. The mixing tank is emptied as far as necessary for the mixture to reach the requested dry matter percentage.

- **Trough check**

These settings apply to all digital trough sensors.

Sensor request time: This is the time required to determine the trough state after the sensor is available for use.

Sensor minimum empty time: This is the minimum time for which a sensor must report empty during the "Sensor request time" for the sensor to be recognized as empty.

Sensor initialize time: The system waits for this time after activation of the trough sensor before analysis of the sensor results starts.

- **Pre-feeding trough check**

Use eating time recording: The pre-feeding trough check uses the current state of the eating time recording. If the eating time recording has recognized an empty trough, this trough is considered empty in the pre-feeding trough check. If the eating time recording has not recognized an empty trough, the trough state is checked again.

- **Feed phase**

Default feed phase: If the pigs have not been assigned a feed phase via a feed curve, the standard feed curve is used instead. This feed phase defines all necessary parameters.

- **Small circuit**

Max. recirculation time is the maximum time used to recirculate feed in the small circuit. The actual recirculation time results from the maximum recirculation time and a percentage value of a feeding or recirculation task in the Task Manager.

- **Content**

Content of pipes: Use this button to set the content of all pipes to water. This may be necessary if

- contents have been mixed up (manual action)
- pipes were extended/changed (e.g. adjusted circuit lengths)

Drain mix-up time determines for how long the mixing tank contents are mixed in the following cases:

- before the contents are pumped into the used water tank at the beginning of preparation
- after the "Maximum waiting time" at the end of preparation
- after watering if the remaining amount in the mixing tank is used for watering first

- **Tank cleaning**

Delay fogging: The delay time between two different fogging processes (acid, base).

- **Liquid level check**

Sensor request time: Request time for the analogue trough sensors to measure the fill level.

Trough empty at: The trough is reported as empty from determination of this fill level.

Number of empty measurements: This parameter only applies to the eating time recording and refers to how often a sensor must report empty before the sensor is considered empty.

Use bypass every n'th loop: This parameter only applies for eating time recording and defines the number of measurements required before "blowing off" for the sensors is activated. For pre-feeding trough checks, the trough state is always measured using "blowing off".

Use bypass at fill level: If the measuring determines a value larger than the fill level, "blowing off" is activated for the next measuring by the sensor.

Warn below fill level: If the measuring determines a value lower than the fill level, a warning is issued recommending a calibration check.

Pressure start delay: The analog trough sensors are checked cyclically for each IO card with analog trough sensors. Pressure is built up before each new measuring cycle. This parameter indicates the duration of the pressure build-up.

Sensor type defines the pressure sensor type on the card.

Tare time defines the time for taring after each measuring cycle.

Loop pause time is the time for which the system waits after each measuring cycle.

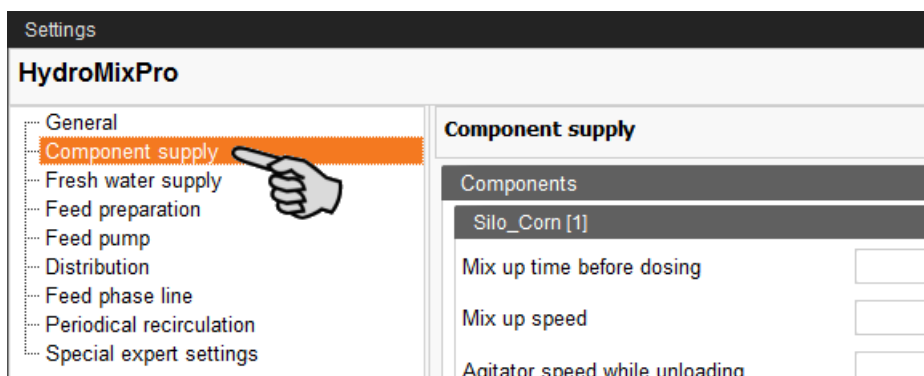
- **Application not operational**

Action after maximum pause time can be set to be either an alarm, a warning or no action at all ("No").

Maximum pause time: If the application does not run for a time longer than set here (pause or error), an alarm or a warning (depending on what is set for "Action after maximum pause time") is issued. If the time is set to 0 minutes, there is no maximum pause time.

Repeat action: When this box is checked, the action (alarm, warning or no action) is repeated every time the maximum pause time expires.

3.2 Component supply



The component supply settings are applicable for the following system components:

- Silo (dry, liquid)
- Mineral dosing unit (dry, liquid)
- MediINJECT, dispensing into the mixing tank
- Pre-mixer

Setting parameters appear depending on the components that are part of your system and that you configured in the Composer. In many cases, the same setting parameters apply to different system components.

3.2.1 Agitators

The agitator settings are applicable for different system components that are also listed in other categories such as "Feed preparation". There are three different agitator types:

- single-stage agitators: direct start, on/off
- double-stage agitators: tapped winding, off/slow/fast
- agitator with frequency inverter

These agitators are used for both weighed and unweighed tanks.

Agitator curves are used for weighed tanks, determining the mixing speed based on the weight. For single-stage agitators, only one agitator curve is created. Slow and fast mixing are identical in this case. For the other agitator types, a slow and a fast agitator curve are created.

Double-stage agitators mix either slow and fast in unweighed tanks. Agitators with frequency inverter mix slowly at minimum frequency and fast at maximum frequency.

Setting parameters

- **Deviation**

This setting only applies to agitators in weighed silos and is necessary if a curve has been created for the agitator. The deviation is the tolerance value ensuring that the agitator is not switched permanently because the weight deviates from the value of the curve point.

- **Error/pause state**

This parameter defines how an agitator behaves if the application or the sub-application is in error or pause mode. The setting is only applicable for agitators in mixing tanks, used water tanks and pre-mixers. However, it is only applicable for mixing tanks and used water tanks if pause or error occur during feeding. The setting is always applicable for pre-mixers if the sub-application is in pause or error mode.

- **Slow curve**

Create a slow curve as follows:

- Click on the "Set slow curve" button.
- Enter the fill amount and the corresponding speed:
 - Tapped winding = off/slow/fast
 - Frequency inverter = direct input in Hz
- Press Enter and continue with your inputs.
- To finish, click on "OK".

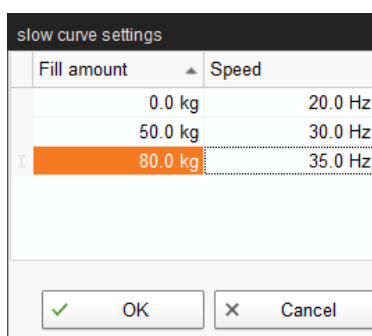


Figure 3-1: Example: Agitator curve for agitator with frequency inverter

- **Fast curve**

Use see chapter 3.2.1 "Agitators", page 67.

Create a fast curve as follows:

- Click on the "Set fast curve" button.

- b) Enter the fill amount and the corresponding speed: Direct start = on / off
Tapped winding = off/slow/fast
Frequency inverter = direct input in Hz
- c) Press Enter and continue with your inputs.
- d) To finish, click on "OK".

fast curve settings	
Fill amount	Speed
0.0 kg	Off
10.0 kg	On
30.0 kg	Off
31.0 kg	On
* 0.0 kg	[EditValue is null]

OK Cancel

The example shows that the agitator mixes from 10 to 30 kg, stops between 30 and 31 kg and continues mixing from 31 kg.

Figure 3-2: Example: Agitator curve for agitator with direct start

- **Maximum speed**

This parameter is only applicable for agitators with frequency inverter. Set the maximum frequency here. If the tank is not weighed, the maximum frequency is used for fast mixing.

- **Minimum speed**

This parameter is only applicable for agitators with frequency inverter. Set the minimum frequency here. If the tank is not weighed, the minimum frequency is used for slow mixing.

3.2.2 Silo dry, silo liquid / liquid add-on

The following setting parameters are applicable for both system components.

- **Mix-up time before dosing**

This setting only applies to silos with agitator. The parameter defines the duration for which the silo contents are mixed before the component is dispensed into the mixing tank or pre-mixer.

- **Mix-up speed**

This setting only applies to silos with agitator. The parameter defines the speed at which the agitator mixes before dosing. For an agitator with direct start, only the option "On" is available. For double-stage agitators with tapped winding or for agitators with frequency inverter, select either the option "Slow" or "Fast".

- **Agitator speed while unloading**

This setting only applies to silos with agitator. The parameter defines the agitator speed during dosing into the mixing tank. The options "on/off" or "fast/slow/off" are available.

- **Recirculation time (only liquid silo)**

This is the duration during which the components are recirculated in the liquid silo before the component is dispensed into the mixing tank. If mixing is also planned for the liquid silo, the contents are recirculated after mixing. This setting only applies for a liquid silo if recirculation is possible in the silo.

3.2.3 Mineral dosing unit dry, mineral dosing unit liquid

The following setting parameters are applicable for both system components.

- **Name**
Name of the system component
- **Ingredient**
Indicates the content of the mineral dosing unit.
- **Amount**
Indicates the current fill level in the mineral dosing unit. The control adjusts this amount when ingredients are removed.
- **Warning amount**
A warning is issued when the content drops below this warning amount.
- **Outlet locked**
No ingredients are removed from the mineral dosing unit as long as this box is checked. Lock the outlet of silos in the Silo Manager, see "Settings" in chapter 5.2 "Silo data", page 124.
- **Mix-up time before dosing**
This setting only applies to mineral dosing units with agitator. The parameter defines the duration for which the contents are mixed before the component is dispensed into the mixing tank or pre-mixer.
- **Mix-up speed**
This setting only applies to silos with agitator. The parameter defines the speed at which the agitator mixes before dosing. For an agitator with direct start, only the option "On" is available. For double-stage agitators with tapped winding or for agitators with frequency inverter, select either the option "Slow" or "Fast".
- **Agitator speed while unloading**
This setting only applies to silos with agitator. The parameter defines the agitator speed during dosing into the mixing tank. The options "on/off" or "fast/slow/off" are available.
- **Fill-in parallel by time**
When this box is checked, a valid dosing speed must be set in the "Feed move settings" or "Feed moves", see chapter "Special expert settings", page 87.

- **Priority**

Priority is a whole number between 0 and 100, with 100 meaning the highest priority. If a component can be removed from multiple tanks during preparation, the tank with the highest number is selected. If the priority is identical, the component is removed from the tank from which it was removed during the last preparation.

3.2.4 MedINJECT – dosing into mixing tank

- **Name**

Name of the system component

- **Ingredient**

Indicates the content of the MediINJECT unit.

- **Amount**

Indicates the current fill level. The control adjusts this amount when ingredients are removed.

- **Warning amount**

A warning is issued when the content drops below this warning amount.

- **Outlet locked**

No components are removed from the pre-mixer as long as this box is checked.

- **Fill-in parallel by time**

When this box is checked, a valid dosing speed must be set in the "Feed move settings" or "Feed moves", see chapter "Special expert settings", page 87.

- **Priority**

Priority is a whole number between 0 and 100, with 100 meaning the highest priority. If a component can be removed from multiple tanks during preparation, the tank with the highest number is selected. If the priority is identical, the component is removed from the tank from which it was removed during the last preparation.

3.2.5 Pre-mixer

- **Name**
Name of the system component
- **Capacity**
Capacity of the pre-mixer. An alarm is generated when the amount filled into the mixer exceeds this value.
- **Maximum amount**
The control fills the pre-mixer up to this level.
- **Minimum amount**
This amount should always be available in the pre-mixer.
- **Agitator off amount**
The agitator is switched off if the amount in the tank is below this value during distribution.
- **Type**
For display purposes in the "Equipment" tab only.
- **Minimum mix amount**
The minimum amount required for mixing.
- **Minimum clean amount**
The minimum amount required for cleaning. This amount is used for cleaning after fogging.
- **Mix-up time before dosing**
This setting only applies to silos with agitator. The parameter defines the duration for which the silo contents are mixed before the component is dispensed into the mixing tank or pre-mixer.
- **Mix-up speed**
This setting only applies to silos with agitator. The parameter defines the speed at which the agitator mixes before dosing. For an agitator with direct start, only the option "On" is available. For double-stage agitators with tapped winding or for agitators with frequency inverter, select either the option "Slow" or "Fast".

- **Agitator speed while unloading**

This setting only applies to silos with agitator. The parameter defines the agitator speed during dosing into the mixing tank. The options "on/off" or "fast/slow/off" are available.

- **Recirculation time**

This is the duration for which the components are recirculated in the pre-mixer before dosing into the mixing tank. If mixing is also planned for the pre-mixer, the contents are recirculated after mixing. This setting only applies to pre-mixers if recirculation is possible in the pre-mixer.

- **Tank content**

Define the tank content manually using this button. This may be necessary if the calculated tank content does not match the actual tank content for any reason.

- **Activate sub-application**

Pre-mixer and feeding process can be started, stopped and activated separately as sub-applications. Activate or deactivate the pre-mixer sub-application here. Deactivation is only possible if the sub-application is not running.

- **Action after maximum pause time**

Can be set to be either an alarm, a warning or no action at all ("No").

- **Maximum pause time**

If the sub-application does not run for a time longer than set here (pause or error), an alarm or a warning (depending on what is set for "Action after maximum pause time") is issued. If the time is set to 0 minutes, there is no maximum pause time.

- **Repeat action**

When this box is checked, the action (alarm, warning or no action) is repeated every time the "maximum pause time" expires.

- **Premix recipe**

Indicates the premix recipe the pre-mixer should prepare. Please find instructions on how to create pre-mix recipes in the following manuals:

- BigFarmNet Manager – Sow Manager (code no. 99-97-2836)
 - BigFarmNet Manager – Finishing Manager (code no. 99-97-0263)

- **Outlet locked**

No components are removed from the pre-mixer as long as this box is checked.

- **Maximum waiting time of premixing**

This parameter is only relevant if the box "Force pre-mixer via circuit" is checked and if the component may be taken from at least one circuit. If the value is greater than 0, the system searches for alternative options after this time.

- **Force pre-mixer via circuit**

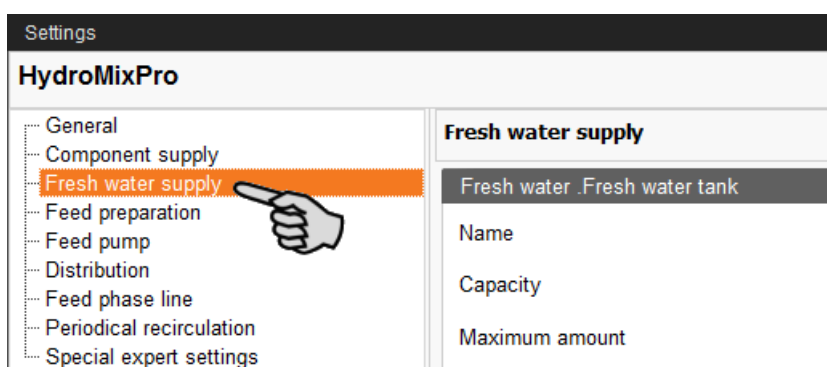
If this box is checked, all components that may be taken from circuits are actually taken from circuits. If one of the circuits is used by other processes, the system waits until all circuits from which the component may be taken are available, see parameter "Maximum waiting time of premixing".

If the box is not checked, the system immediately searches for other options in case a circuit from which the component may be taken is not available. The available and permitted options of taking components from a circuit are used first in this case.

- **Priority**

Priority is a whole number between 0 and 100, with 100 meaning the highest priority. If a component can be removed from multiple tanks during preparation, the tank with the highest number is selected. If the priority is identical, the component is removed from the tank from which it was removed during the last preparation.

3.3 Fresh water supply



Fresh water supply must be defined for a weighed fresh water tank. The parameters remain inactive (grayed out) if the fresh water tank is not weighed.

Setting parameters

- **Fresh water tank**

Name of the tank

Capacity of the tank

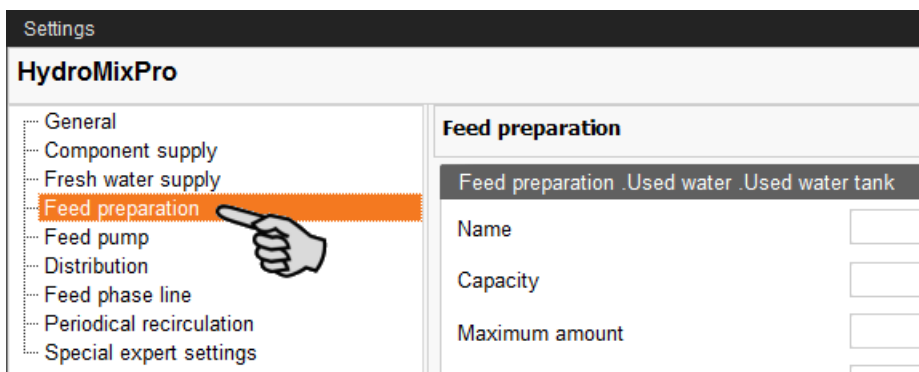
Maximum amount: The tank is only filled up to this maximum amount.

Minimum amount: The tank is not emptied below this amount.

- **Fresh water pump**

If the fresh water pump is controlled by a frequency inverter, configure the corresponding settings here, see settings for pumps, chapter 3.5 "Feed pump" page 79.

3.4 Feed preparation



Configure settings for the mixing tank and the used water tank (if available) in the category "Feed preparation".

3.4.1 Mixing tank, used water tank

The following setting parameters are usually applicable for both system components.

- **Name**

Name of the system component

- **Capacity**

Capacity of the system component

If the amount in the tank is greater than this value, the system goes into error mode.

- **Maximum amount**

The maximum fill level for the tank.

The system works with this value and the control fills the tank up to this value. The maximum amount should be slightly lower than the capacity due to the residual flow volume. The system goes into error mode when the capacity is exceeded.

- **Minimum amount**

This minimum amount should always be in the tank to prevent e.g. too much air from entering the tank or the pump from running dry. The control will empty the tank down to this amount.

- **Agitator off amount**

The agitator is switched off if the amount in the tank is below this value during distribution.

- **Type**

For display purposes in the "Equipment" tab only.

- **Minimum mix amount (only mixing tank)**

The minimum amount required for mixing.

- **Minimum clean amount**

The minimum amount of water required for tank cleaning.

The minimum cleaning amount is used even if the amount for tank cleaning is smaller than set, see chapter 4.1.3 "Tank cleaning", page 108. After fogging, the tank is rinsed with the minimum amount. If fogging is cancelled during fogging, the tank is still rinsed with this amount before the safety switch is released.

- **Mix-up time before dosing (only used water tank)**

This is the duration for which the content of the used water tank is mixed before the used water is removed for preparation in the mixing tank or pre-mixer.

- **Mix-up speed (only used water tank)**

This is the mixing speed before dosing.

Single-stage agitators only have the option "on", all other agitators the option "slow/fast".

- **Agitator speed while unloading (only used water tank)**

When filling the mixing tank or the pre-mixer from the used water tank, this speed is used for mixing in the used water tank ("on/off" or "off/slow/fast").

- **Tank content**

Define the tank content manually using this button. This may be necessary if the calculated tank content does not match the actual tank content for any reason. No feeding would take place.

- **Activate sub-application (only mixing tank)**

Pre-mixer and feeding process can be started, stopped and activated separately as sub-applications. Activate or deactivate the pre-mixer sub-application here. Deactivation is only possible if the sub-application is not running.

- **Action after maximum pause time**

Can be set to be either an alarm, a warning or no action at all ("No").

- **Maximum pause time**

If the sub-application does not run for a time longer than set here (pause or error), an alarm or a warning (depending on what is set for "Action after maximum pause time") is issued. If the time is set to 0 minutes, there is no maximum pause time.

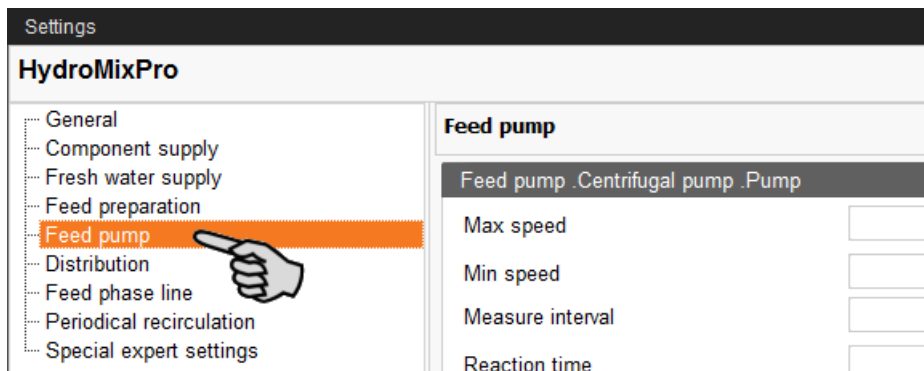
- **Repeat action**

When this box is checked, the action (alarm, warning or no action) is repeated every time the "maximum pause time" expires.



For the setting parameters for agitators, see chapter 3.2.1 "Agitators", page 67.

3.5 Feed pump



3.5.1 Pump types

There are three different pump types. The type of each pump is defined in the Composer.

- Pump with direct switch-on
- Pump with frequency inverter
- Pump with shared frequency inverter

No settings must be configured for pumps with direct switch-on. In the case of pumps with shared frequency inverter, multiple pumps share one frequency inverter. This is only possible if pumps never operate at the same time for process reasons.

3.5.2 Speed control for pumps with frequency inverter

For all feed moves carried out with a pump with frequency inverter, set the following parameters under "Special expert settings" > "Feed move settings" in a specific case.

- standard speed
- slow speed (speed for fine dosing)

This is the case where the control can determine a speed, i.e. source and target differ and at least one of the two tanks is weighed or the feed move has a flow meter.

If no speeds are available, i.e. the speeds are 0, the components are pumped at maximum frequency for "standard speed" and at minimum frequency for "slow speed" (speed for fine dosing). The control memorizes the best frequency it was able to determine for standard and low speeds for each feed move and for each feed valve where feed is dispensed after a feed move. The control uses this memorized value for the next feed move.

3.5.3 Eccentric pump, centrifugal pump

The following parameters are applicable for both pumps.

- **Maximum speed:** The maximum frequency of the pump's frequency inverter is set here.
- **Minimum speed:** The minimum frequency of the pump's frequency inverter is set here.
- The **measure interval** is set to control the speed.
- **Reaction time** or waiting time is the duration for which the system waits after adjusting the speed before the next speed measurement starts with the set measuring interval.
- **Maximal deviation** from the target speed. If the measured speed deviates from the target speed by more than this value, a new frequency is set so the measured speed meets the target speed more closely.
- **Maximum adjustment per step:** This parameter is used to keep the control from changing the frequency too much at each adjustment. This may specifically make sense for centrifugal pumps.
- **Shared frequency inverter:** The frequency inverter that controls the pump is adjusted here. This parameter only exists if the pump is controlled by a shared frequency inverter.
- **Flow meter**

Volume per pulse: This value must match the set value of the flow meter.

Flow meter locked: The flow meter will not be used when this box is checked.

3.6 Distribution



The settings in the category "Distribution" are applicable for the following system components:

- MediINJECT for dosing into branch (stub) lines or valves
- main circuit
- simple circuit
- branch line, i.e. stub line
- branch line with jet

Setting parameters appear depending on the components that are part of your system and that you configured in the Composer. In many cases, the same setting parameters apply to different system components.

3.6.1 MediINJECT – dosing into branch lines or valves

- **Name**
Name of the system component
- **Ingredient**
Content (medication) of the MediINJECT

3.6.2 Main circuit, simple circuit

- **Residue-free**
Defines whether feeding in this circuit should be residue-free or not.

Main circuit: This setting defines for all subcircuits of the main circuit whether feeding is residue-free or not. In the subcircuit settings, this distinction is no longer possible.
- **Maximum recirculation time**
This is the maximum time for recirculation in the respective circuit. This setting only applies to non-residue-free feeding.

The actual recirculation time results from the maximum recirculation time and a percentage value in a feeding task in the Task Manager.
- **Mixing zone weight**
The mixing zone that must be available so feed can be pushed through the line. This amount is prepared additionally.

Branch line with jet: This weight is distributed to the segments for branch dosing.

- **Switch circuit delay**

If dosing switches from circuit to circuit, the system waits for this time to close the start valve of the previous circuit. The goal of this setting is preventing banging in the pipes.

- **Pressure duration**

Build-up of pressure in the closed circuit.

- **Delay PSI**

After opening the feed valves, the system waits for this time before starting to work with the PSI counter pressure.

- **PSI station**

Selection of the PSI station used for this circuit.

- **Pushing component**

Selection of the component used for pushing. If no component is selected, the system pushes with water.

- **Additional pushing comp. amount**

This amount of the pushing component is taken in addition to the calculated amount. The setting is to prevent that small amounts must be taken in later on.

- **Force feed preparation via circuit**

If this box is checked, the control waits until all required feed move routes are available to take a component from the circuits during feed preparation. If this is not possible, the system immediately searches for alternative feed moves. For a component to be taken from the circuit during preparation, the component must be configured accordingly and the content of the circuit must allow dosing. Components are not even dosed via circuits for possible later mixing.

3.6.3 Branch line, branch line with jet

- **Mixing zone weight (only branch lines with jet)**

The mixing zone that must be available so feed can be pushed through the line. This amount is prepared additionally.

Branch line with jet: This weight is distributed to the segments for branch dosing.

- **Switch circuit delay**

If dosing switches from circuit to circuit, the system waits for this time to close the start valve of the previous circuit. The goal of this setting is preventing banging in the pipes.

- **Pressure duration**

Build-up of pressure in the closed circuit.

- **Delay PSI**

After opening the feed valves, the system waits for this time before starting to work with the PSI counter pressure.

- **PSI station**

Selection of the PSI station used for this circuit.

- **Jet blockage waiting time (only branch lines with jet)**

The system waits for this time before it builds up pressure so jet blockages can be removed during emptying.

- **Jet start station size (only branch lines with jet)**

This parameter is only applicable for branch lines with jet. The parameter indicates how large the start station of the branch line with jet is. Additionally, the parameter differentiates whether the lines were blocked during emptying or whether the remaining amount in the branch line is due to inaccuracies.

Example: The scale does not show any weight changes while the branch line with jet is emptied. This can have two causes:

- a blockage;
- the sensor in the start station was not triggered because it is defective or because the jet was too fast.

The parameters helps distinguishing the two cases. If the content of the branch line is located in the start station, the sensor was probably not triggered. If this is not true, a blockage is probably the cause.

- **Jet end station size (only branch lines with jet)**

This parameter indicates how large the end station of the branch line with jet is. The parameter differentiates whether the jet actually reached the end after receipt of the jet end signal or whether the jet cannot be at the end based on the calculated content.

- **Content warning (only branch lines with jet)**

During filling of a branch line with jet, the end sensor of the branch line may rarely be triggered too early so the branch line with jet is not filled entirely according to the calculations of the control software. If the calculated fill level of the branch line lies within the set tolerances, the calculated fill level is adjusted so the control software believes the branch line to be completely full. A warning is issued in addition to the adjustment.

Deactivate this warning by unchecking this box.

- **Maximum attempts (only branch lines with jet)**

This parameter defines the maximum number of attempts carried out to remove a blockage in a branch line with jet. If this number is exceeded with the blockage not removed, an alarm is generated and the system goes into error mode.

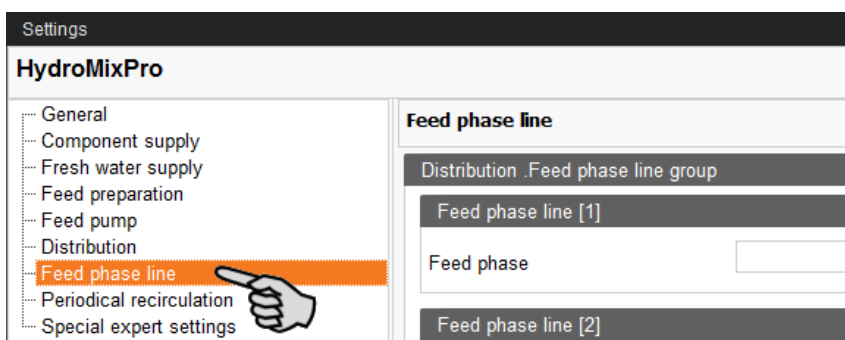
- **Pushing component**

Selection of the component used for pushing. If no component is selected, the system pushes with water.

- **Additional pushing comp. amount**

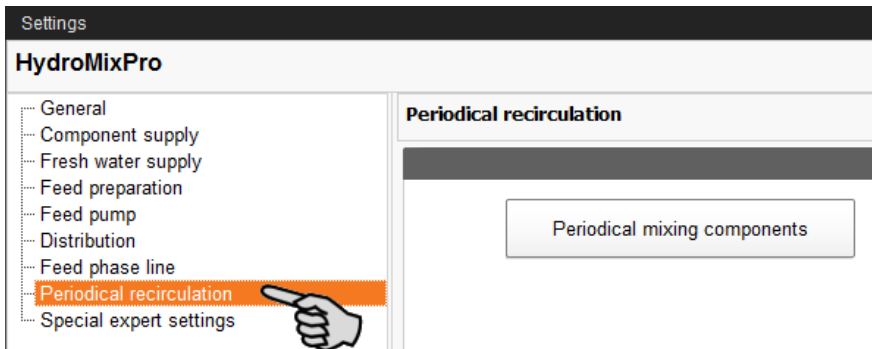
This amount of the pushing component is taken in addition to the calculated amount. The setting is to prevent that small amounts must be taken in later on.

3.7 Feed phase line



Assign one or multiple feed phases to each feed phase line here. Create the feed phases available for selection in the menu "Configuration" > "General" > "Feed phase" beforehand. All animals are assigned a feed phase for each day via the feed curve. The animals are fed by the feed phase line which is assigned to the corresponding feed phase.

3.8 Periodical recirculation



Define time periods in which components in the tanks are mixed and recirculated in specific intervals in the category "Periodical recirculation", Mixing and recirculation in different silos always starts with a one-minute delay to prevent overloading of the power grid.

1. Click on "Add" to define a new time period.

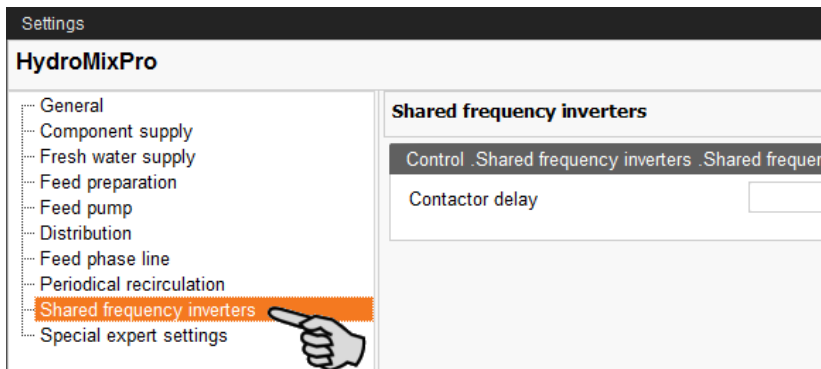


2. Configure settings for the following parameters:
 - **Tank:** Selection of the tank or silo. Only silos with agitator or a line for recirculation appear in the list.
 - **Start:** The start time from which the configuration is valid.
All entries must have different start times to ensure that not too many pumps start at the same time, as this could lead to problems with the power grid.
 - **End:** The end time until which the configuration is valid.
If the start time is later than the end time, the configuration remains valid until the next day.
 - **Interval time span:** Time intervals in which recirculation starts in the silo. Recirculation can be delayed. This depends on whether another silo was also started in the past minute.
 - **Mixing time**

- **Agitator state:** fast / slow, on / off
- **Recirculation time**
- **Recirculation slow mixing:** Use this option to select whether the agitator runs slowly or not at all during recirculation.

3. Click on "Save" to save the configuration.

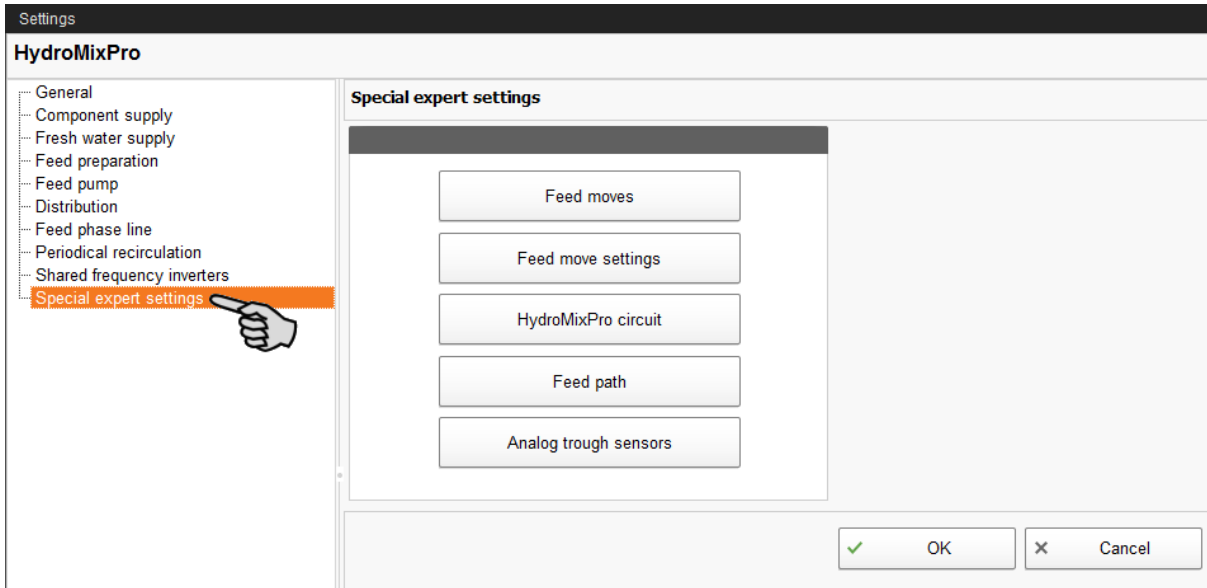
3.9 Shared frequency inverters



Use this setting to define the delay after switching on and before switching off the contactor for each shared frequency inverter.

Define the **Contactor delay** between switching of the pump's contactor and controlling the frequency inverter.

3.10 Special expert settings



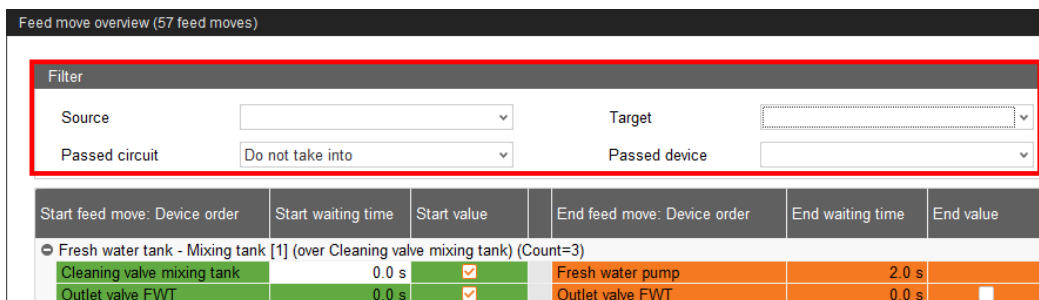
Use the category "Special expert settings" to configure exact settings for each feed move individually.

3.10.1 Feed moves

Define switch times and the switch order for feed moves in the dialog window "Feed move overview".

These settings should only be configured by a service technician.

1. Click on the button "Feed moves" under "Special expert settings".
This opens the dialog window "Feed move overview".
2. If necessary, filter the feed moves you want to edit:
 - a) Select the start (source) and/or target, the circuit or the device for the feed move from the corresponding drop-down menus under "Filter".



- b) Use the buttons "Collapse" and "Expand" in the lower command bar to show or hide the devices included in the feed move.
3. Define new switch times by entering the times directly into the input fields of the columns "Start waiting time" and "End waiting time".

The values in the area marked green on the left refer to the start of the feed moves. The values in the area marked orange on the right refer to the end of the feed moves. The system moves from the first to the last device while starting and ending feed moves. After a device has been switched, the system waits for the waiting time before switching the next device.

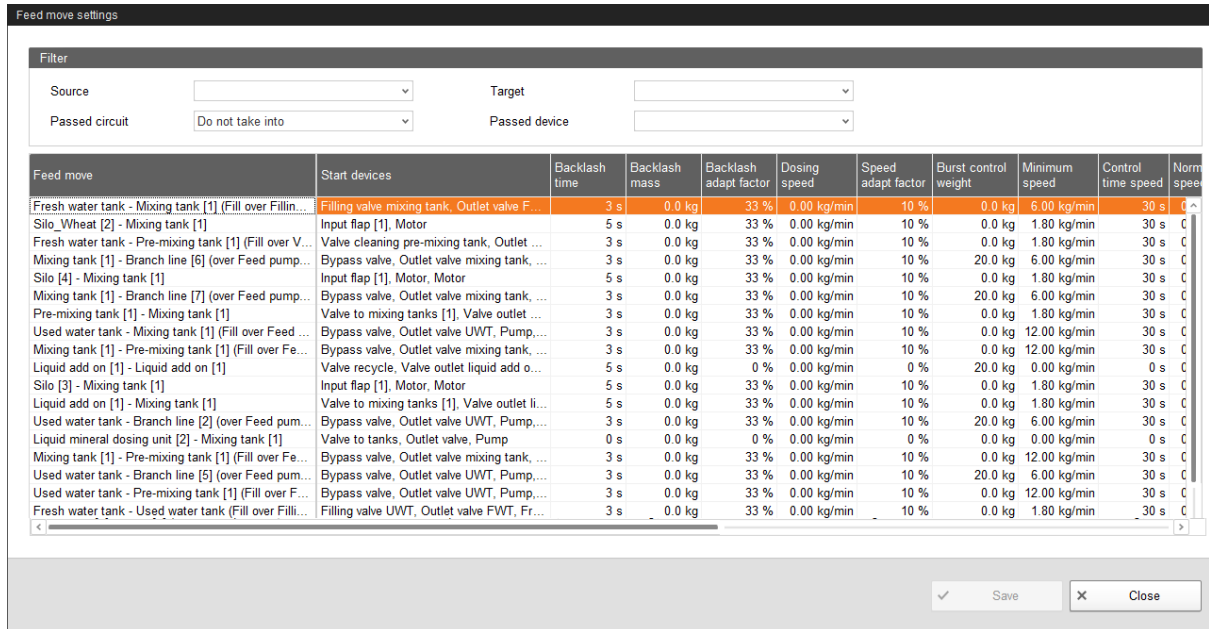
4. Define partial stops for the switch from one feed move to the next:
 - a) Check the box in the column "End partial stop" for the corresponding devices. A partial stop is carried out when the system switches directly from one feed move to another. First, all devices of the old feed move for which "End partial stop" has been activated are switched. In case both feed moves use the same feed pump, all devices of the new feed move are switched all the way to the feed pump in the next step. This is to prevent the pump from running dry. Next, all devices of the old feed move for which "End partial stop" has not been activated and which are not part of the new feed move are switched. All as of yet unswitched devices of the new feed move are switched as the last step.
5. If necessary, define a new switch order for the devices.
 - a) Right-click on the corresponding device.
 - b) Change the position of the device using the options "Device up" or "Device down".
6. Define the stop time to indicate how long the stopped system should maximally wait for an end of the feed moves:
 - a) Click on the "Max. stop time" button in the bottom command bar.
 - b) In the next dialog window, change the time displayed for "Additional stop time", if necessary.
 - c) Click on "Save".

The maximum stop time results from the sum of all feed move waiting times plus the residual flow time for the feed move. The stop time is currently determined automatically. The additional stop time is added to the automatically calculated stop time, resulting in the maximum stop time.

7. Click on "Save" to save all settings.

3.10.2 Feed move settings

In the dialog window "Feed move settings", define different parameters for the feed moves as described in the following.



1. Click on the button "Feed move settings" under "Special expert settings".
2. If necessary, filter individual feed moves you want to edit:
 - a) Select the start (source) and/or target, the circuit or the device for the feed move from the corresponding drop-down menus under "Filter".
 - b) Drag the horizontal scroll bar at the bottom all the way to the right to see any hidden parameters.
3. If you want to define the same setting (value) for multiple feed moves, use one of the following options for multi-editing:
 - a) Select multiple feed moves:

Hold the Shift key and click on the first and last position to select all positions inbetween.

Hold the Ctrl key and click on the individual positions to select multiple positions.
 - b) Right-click into the marked area.
 - c) Click on "Multi edit".

This opens a dialog you can use to change the values.
4. Change the values either in the multi-edit dialog or directly in the respective input field when editing individual values.
5. Click on "Save" to save all settings.

Parameter definition

- Individual feed moves and the corresponding devices to be started and stopped are displayed under **Feed move** and **Start devices**.

- **Backlash time** to measure the residual flow.

This time does not apply to feed moves for feeding or watering at a valve or to push to a valve. The corresponding times of the general settings are used for this purpose.

- **Backlash mass:** The residual flow volume determined by the control.

The residual flow volume for feed moves for feeding or watering at a valve and to push to a valve are not saved here, but in the valve settings under "Special expert settings – HydroMixpro circuit".

- **Backlash adapt factor:** Weighting of the new value to calculate the residual flow.
- **Dosing speed:** The dosing speed is determined and set automatically for dosing based on weight. Calculate and enter the dosing speed if the system doses based on time.
- The **speed adapt factor** is the weighting of the new factor to calculate the dosing speed.
- **Burst control weight:** This setting is only important for feed moves
 - from one weighed tank to another weighed tank;
 - from one weighed tank to itself (recirculation);
 - through a flow meter whose source or target tanks are weighed;
 - from a weighed tank that fills a branch line with jet.

If a weight deviation larger than the value set here is determined while these feed moves are carried out, the alarm "Unexpected weight loss" is generated.

Make sure to enter a value larger than the amount that can fit into a branch line for feed moves that fill a branch line with jet.

- **Minimum speed:** If this speed is not reached, an alarm is generated, e.g. empty silo, clogging.
- **Control time speed** are time intervals in which the minimum speed is checked.
- **Normal speed*:** The target speed of the feed move.
- **Slow speed*:** The target speed of the feed move in case of fine dosing.
- **Fine dosing amount*:** If the remaining amount to be dispensed is smaller than this amount, the system switches to fine dosing.

- **Minimum mass fast dosing***: This is the minimum amount to be dispensed at normal speed. If the entire amount to be dispensed is smaller than the sum of "Fine dosing amount" and "Minimum mass fast dosing", the entire amount is dispensed with fine dosing.
- **Normal frequency** indicates the frequency inverter's frequency for normal speed. The normal speed is adjusted by the control. For feed moves to a feed valve, the frequency is saved in the valve settings under "Special expert settings – HydroMixPro circuit".
- **Slow frequency**: This setting indicates the frequency inverter's frequency for fine dosing speed. The fine dosing speed is adjusted by the control. For feed moves to a feed valve, the frequency is saved in the valve settings under "Special expert settings – HydroMixPro circuit".
- **Maximum jet drain speed deviation**: This percentage refers to the target speed for jet emptying ("normal speed" and "slow speed"). Compressed air for the jet is switched on when the measured speed is below the target speed by this percentage. Compressed air for the jet is switched off as soon as the speed is above the target speed by this percentage.

*The parameters **normal speed**, **slow speed**, **fine dosing amount** and **minimum mass fast dosing** are only relevant for the following feed moves:

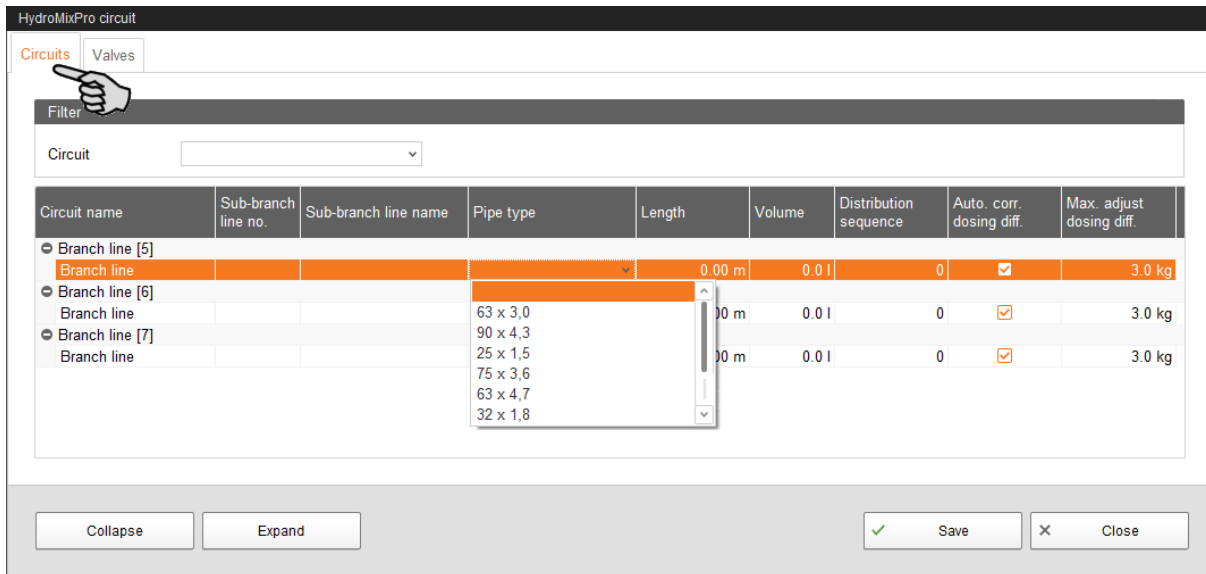
- feed moves with a pump controlled by a frequency inverter which have a weighed source or target tank or which include a flow meter;
- feed moves to empty a branch line with jet into a weighed tank, see also the parameter "Maximum jet drain speed deviation".

3.10.3 HydroMixPro circuit

Configure settings for the circuits and the valves in this dialog.

"Circuits" tab

Configure circuits, branch lines and sub-branch lines under the "Circuits" tab. This includes the definition of pipe types and pipe lengths. Additionally, you may define specific parameters for each circuit.



1. Click on the button "HydroMixPro circuit" under "Special expert settings".
The first tab of the dialog window is called "Circuits".
2. If necessary, filter the circuit you want to edit:
 - a) Under "Filter", select the correct circuit from the drop-down menu.
 - b) Use the buttons "Collapse" and "Expand" in the lower command bar to show or hide branch lines.
3. Change the parameters' values directly in the corresponding input field.
4. Click on "Save" to save all settings.

Parameter definition

- **Pipe type:** Selection via drop-down menu
- The **length** is required to define the pipe volume in case of residue-free feeding.
- The **volume** is calculated automatically as soon as a value is entered for the parameter "Length".
- **Distribution sequence** defines the sequence of the distribution. Dosing starts with the smallest number.

- **Automatic correction dosing difference:** The dispensed amount is adjusted during active dosing when this box is checked. If there is too much or too little feed, the amount to be dispensed by the remaining valves is adjusted.
- **Maximum adjust dosing difference:** This parameter defines the maximum adjustment. If too much or too little feed was dispensed at one valve, the amount for this valve is adjusted for the next feeding.

"Valves" tab

Define different parameters for the valves in the "Valves" tab.

House	Section	Pen	Valve	Distance in [m]	+ / - in [m]	Pipe type	Volume	Distribution sequence	Dosing difference	Backlash feeding	Backlash movement	Backlash watering	Stop point
Branch line [5]													
Rearing house	Big group 1	Group pen	Feed valve [1]	0.00	0.00		0.0 l	0	0.0 kg	0.000 kg	0.000 kg	0.000 kg	<input checked="" type="checkbox"/>
Rearing house	Big group 1	Left	Feed valve [2]	0.00	0.00		0.0 l	0	0.0 kg	0.000 kg	0.000 kg	0.000 kg	<input type="checkbox"/>
Rearing house	Big group 1	Right	Feed valve [3]	0.00	0.00		0.0 l	0	0.0 kg	0.000 kg	0.000 kg	0.000 kg	<input type="checkbox"/>
Branch line [6]													
Rearing house	Big group 1	Group pen	Feed valve [1]	0.00	0.00		0.0 l	0	0.0 kg	0.000 kg	0.000 kg	0.000 kg	<input type="checkbox"/>
Rearing house	Big group 1	Left	Feed valve [2]	0.00	0.00		0.0 l	0	0.0 kg	0.000 kg	0.000 kg	0.000 kg	<input type="checkbox"/>
Rearing house	Big group 1	Right	Feed valve [3]	0.00	0.00		0.0 l	0	0.0 kg	0.000 kg	0.000 kg	0.000 kg	<input type="checkbox"/>
Branch line [7]													
Rearing house	Big group 1	Group pen	Feed valve [1]	0.00	0.00		0.0 l	0	0.0 kg	0.000 kg	0.000 kg	0.000 kg	<input type="checkbox"/>
Rearing house	Big group 1	Left	Feed valve [2]	0.00	0.00		0.0 l	0	0.0 kg	0.000 kg	0.000 kg	0.000 kg	<input type="checkbox"/>
Rearing house	Big group 1	Right	Feed valve [3]	0.00	0.00		0.0 l	0	0.0 kg	0.000 kg	0.000 kg	0.000 kg	<input type="checkbox"/>

1. Click on the button "HydroMixPro circuit" under "Special expert settings".
2. Click on the "Valves" tab in the dialog window.
3. If necessary, filter the circuit and the sub-branch line you want to edit:
 - a) Under "Filter", select the correct circuit and sub-branch line from the drop-down menu.
 - b) The valves can be grouped according to location or circuit by selecting the corresponding option next to "Grouping".
 - c) Use the buttons "Collapse" and "Expand" in the lower command bar to show or hide valves.
 - d) Drag the horizontal scroll bar at the bottom all the way to the right to see any hidden parameters.
4. If you want to define the same setting (value) for multiple valves, use one of the following options for multi-editing:

a) Select multiple valves:

Hold the Shift key and click on the first and last position to select all positions inbetween.

Hold the Ctrl key and click on the individual positions to select multiple positions.

b) Right-click into the marked area.

c) Click on "Multi edit".

This opens a dialog you can use to change the values.

5. Change the parameters' values directly in the corresponding input field.

6. Click on "Save" to save all settings.

Parameter definition

- Individual feed moves and the corresponding devices to be started and stopped are displayed under **Feed move** and **Start devices**.
- **Valve:** The name of the valve can be changed here.
- **Distance in [m]:** Fixed distance of the valve, usually to the circuit's start valve.
- **+/- in [m]:** Additional option for adjusting the valve distance. This option allows moving multiple valves by a specific distance at the same time without having to change all valves individually.
 - a) Enter the required (positive or negative) change value into the input field of the valve.
 - b) Click on "+/- => Distance" in the bottom command bar.

All subordinate valves are adjusted automatically, based on the change value.
- **Pipe type:** Selection via drop-down menu.
- The **volume** is calculated based on the pipe type and length.
- **Distribution sequence** defines the sequence of the valves. This parameter is only used for systems without residue-free feeding and if the setting "Manual control" was configured in the Task Manager below the parameter **Trough sequence**, see chapter 4.1.1 "Feeding: restrictive liquid", page 102.
- **Dosing difference:** For each valve, the difference between the actually dispensed amount of feed and the originally planned amount are added up. This dosing difference is used to adjust the amount of feed for the next feeding.
- **Backlash feeding** is the measured residual flow for feed dosing. The valve is closed earlier, depending on the residual flow.

- **Backlash movement** is the measured residual flow used for pushing to the stop point. The valve is closed earlier, depending on the residual flow.
- **Backlash watering** is the measured residual flow for watering. The valve is closed earlier, depending on the residual flow.
- **Stop point:** Check this box to select valves or sub-branch lines as additional, manual stop points. These stop points are used for residue-free dispensing in the circuit, in addition to the stop points calculated by the software.
- **Maximum feed amount** that is dispensed at this valve for one feeding.
- **Disable sensor use:** The trough sensor at this valve is disabled and no longer used for pre-feeding trough checks or eating time recording.
- **Normal frequency:** Pump frequency for normal dosing.
- **Slow frequency:** Pump frequency for fine dosing.
- **IO card:** Link between the valve and the selected IO card.
- **Channel:** Link between the valve and the selected channel's IO card.
- **Trough type** defines the trough geometry for use with the analog trough sensors.
- **Trough length** defines the trough length for use with the analog trough sensors.
- **Sensor height** is the distance between the analog trough sensor and the trough bottom.
- **Sensor offset:** This value is determined during calibration of the analog trough sensors with an empty trough. The sensor offset is required to determine the trough's fill level during normal measuring operation.
- **Sensor pressure:** This value is determined during calibration of the analog trough sensors with an empty trough. The sensor pressure is required to determine the trough's fill level during normal measuring operation.

3.10.4 Analog trough sensors

Use this dialog to test and calibrate the analog trough sensors.

The screenshot shows the 'LLC trough sensor calibration' dialog box. It features a title bar and several functional areas. At the top, there's a 'Junction boxes' dropdown menu currently set to '[EditValue is null]', accompanied by 'Reserve access' and 'Release access' buttons. Below this is a 'Current pressure' input field. The main area is divided into two panels: 'Sensor test' and 'Calibration'. The 'Sensor test' panel includes a 'Sensor' dropdown menu (also showing '[EditValue is null]'), three checkboxes for 'use bypass', 'bleeding', and 'main valve', and a 'set Tara' button. The 'Calibration' panel has a 'Duration' input field, a 'use bypass' checkbox, and a 'Calibrate' button. At the bottom of the dialog is a table with columns for 'Pen', 'Sensor name', 'Old offset', and 'Old pressure'. The table is currently empty. The footer contains 'Save' and 'Close' buttons.

1. Click on the button "Analog trough sensors" under "Special expert settings".
2. The following setting options are available:
 - **Junction box:** Selection of the card with the analog trough sensors via drop-down menu.
The table lists the connected sensors.
 - The button "**Reserve access**" reserves access for the card selected under "Junction boxes".
A reserved card cannot be used for level checks by the control. Any active eating time recording for sensors on this card is therefore cancelled.
 - The button "**Release access**" releases access to the card selected under "Junction boxes".
The control can then use the box for level checks again. The card is also released if the dialog or BigFarmNet Manager is closed.
 - **Current pressure** indicates the currently measured pressure.

- **"Sensor test" area**

The sensor test checks the pressure values measured by the sensors.

Sensor: Selection of a sensor that is linked with the card.

Use bypass: The signal for the bypass is switched on the sensor card.

Bleeding: The bleeding signal is switched on the sensor card.

Main valve: The signal for the main valve is switched on the sensor card.

Button "Set Tara": The SDO for taring the sensor is sent to the card. The control works without taring. This means that the calibration process and the following use of the sensor will lead to **incorrect** results after clicking on this button. Please proceed with caution when using the "Set Tara" function!

- **"Calibration" area**

All connected sensors are calibrated in this area. A measured pressure and an offset for correction of later measurements are determined for each sensor. After successful calibration, the table view is extended to show the newly determined offset (new offset) and pressure (new pressure) values.

Duration shows the estimated time remaining for the current calibration.

Use bypass defines whether calibration is carried out with active "blowing off".

The **button "Calibrate"** starts the calibration process for the sensors.

- **Table view**

Pen

Sensor name

Old offset is the previously determined offset used to calibrate the measured sensor values.

Old pressure is the previously determined measured pressure used to calibrate the measured sensor values.

New offset is the newly determined offset after calibration.

New pressure is the newly determined measured pressure after calibration.

Check box "Save": After successful calibration, the new calibration values are listed in the table below. An additional column "Save" appears. Check the box to determine for which sensors the new calibration should be used.

3. Click on "Save" to save these settings.

All selected new calibration values are saved for the control. Non-selected calibration values are discarded.

3.11 Data backup

We recommend data backups in regular intervals. In case of a data loss, the backup can then be used to retrieve saved data. As storage location for the backup, we recommend using an external hard or flash drive.

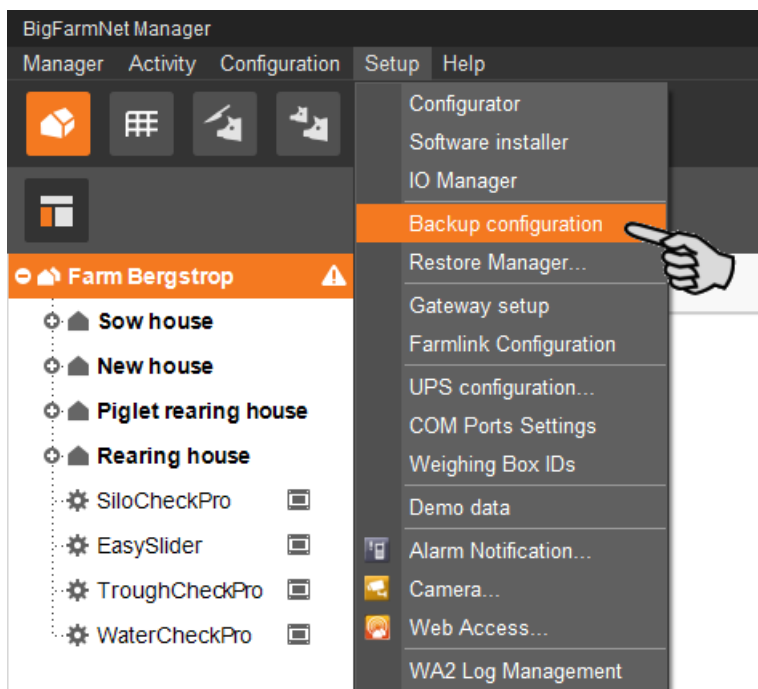
Remember that you can only retrieve the last data backup. Everything you have created or changed since then is not included in this backup. This means that the backup period should be determined depending on the amount of data you produce. You should find the ideal compromise between acceptable data loss and frequency of backups based on your individual needs.

The BigFarmNet Manager provides the following options for data backups:

- Manual backup, which you may carry out at any time when necessary.
- Automatic backup, for which you define a fixed backup period. The data is then backed up automatically according to the settings.

Open the settings dialog as follows:

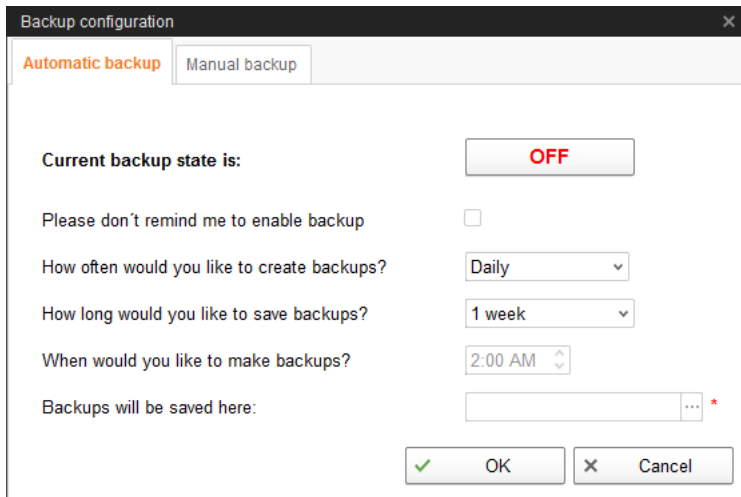
1. Click on "Data backup" in the "Setup" menu.



2. In the window "Backup configuration", select the desired process using one of the two tabs:

Automatic backup

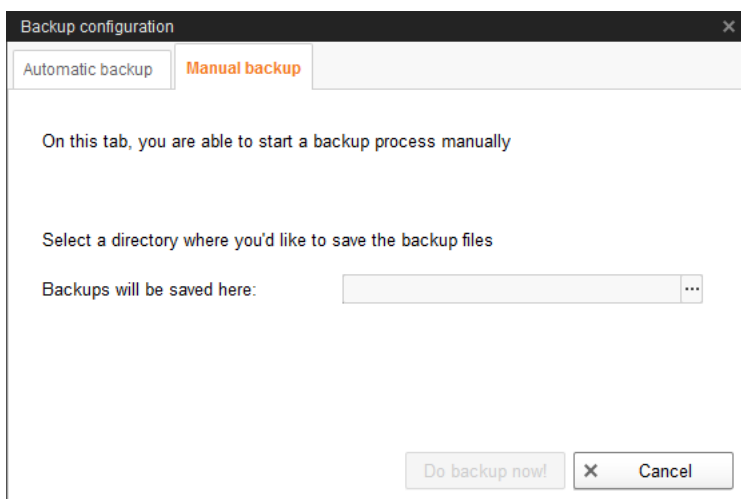
The automatic backup is pre-set to "OFF".



- a) Click on "OFF" to turn off the deactivation.
The button then switches to "ON".
- b) Determine the backup period.
- c) Select an external storage location.
- d) Click on "OK" to accept these settings.

Or:

Manual backup



- a) Select an external storage location.
- b) Click on the now active button "Create backup now!"

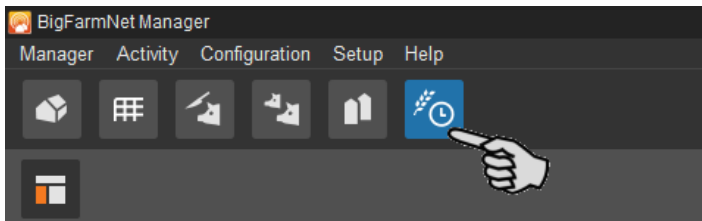
4 Task Manager

The task manager allows you to save feeding and cleaning tasks for your specific feeding system.

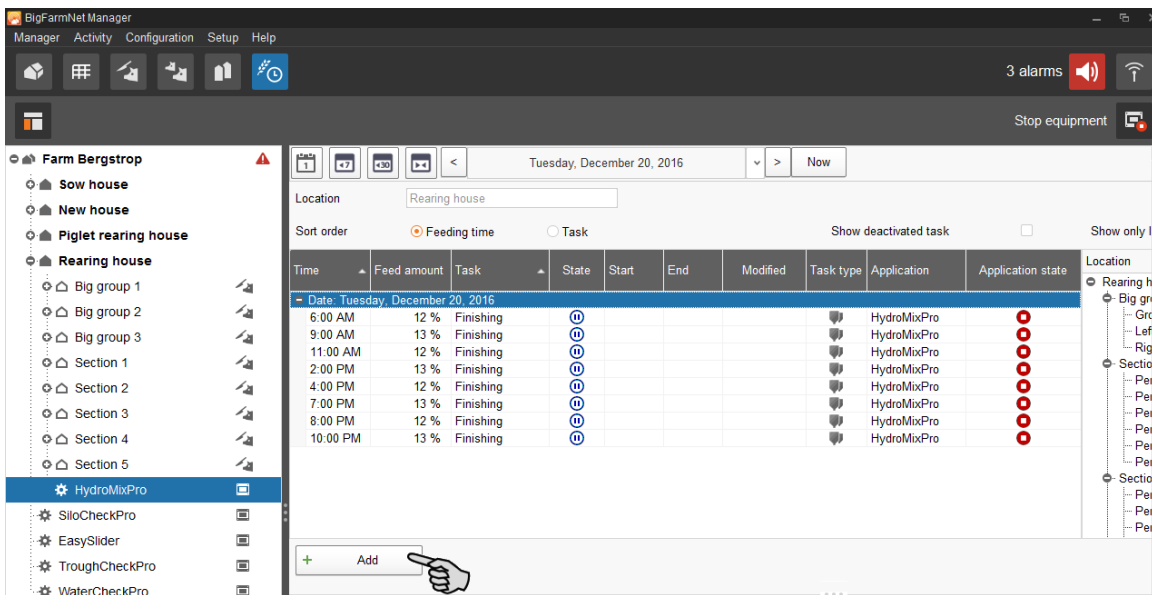
4.1 Defining a task

Depending on the "strategy", you can define times and technical settings for feeding and cleaning in the "Feeding task" dialog.

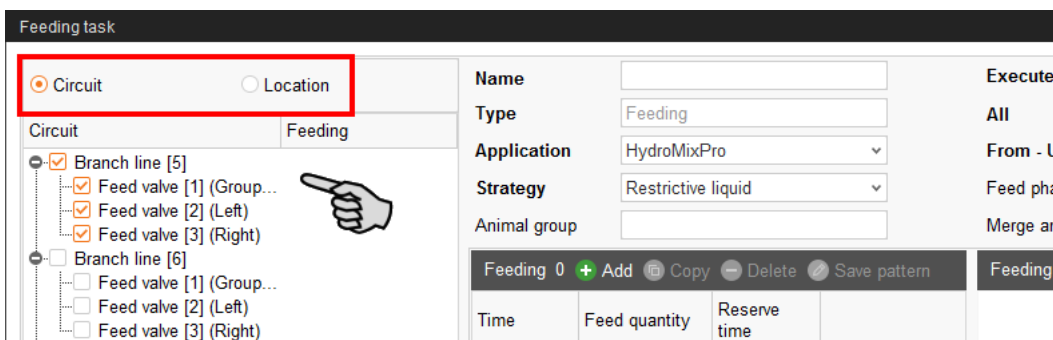
1. Click on "Task Manager" in the management area.



2. In the application window, click on "Add".



3. In the left-hand part of the "Feeding task" dialog window, select the correct location or circuit by checking the corresponding box.



4. Define information for the task at the top.

Fields with bold text are mandatory.

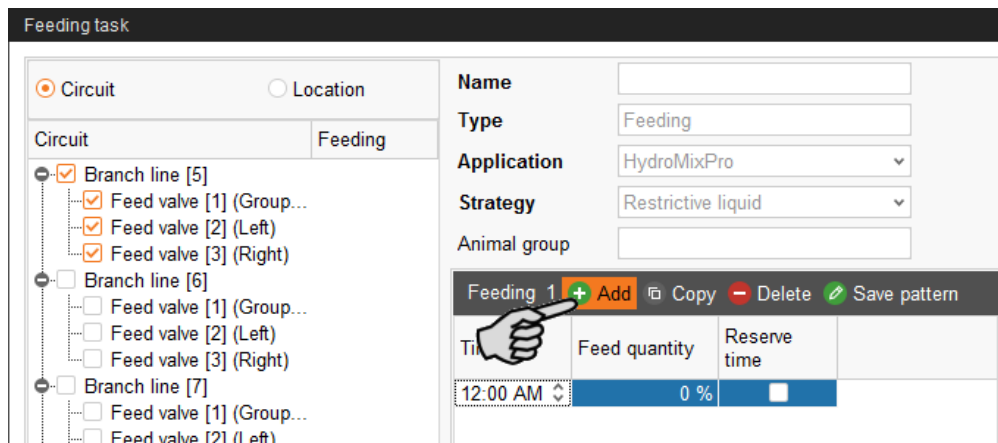
- **Name** of the task
- **Type** is pre-set to "Feeding".
- **Application**
- **Strategy** is the subject of the task: feeding, cleaning or recirculation.
The different strategies will be explained in the following chapters.
- **Animal group**: You can select individual animal groups from the selected location or circuit. The different group numbers of the animal groups are separated by commas. The animal groups then receive feed in the stated order (grouping e.g. for animal groups of the same age).
If no information is provided, all available animal groups of the selected location or circuit receive feed.
- **Execute**: every day or once per week
- **All ... days**: The task should be executed every nth day.
- **From – Until**: Time period for this task. The task will not be started outside of this time period.
- **Feed phase**: Select one or more feeding phases, if necessary, and click on "OK". Only the animal groups included in this feeding phase will receive feed.
- **Merge animal groups**: If multiple animal groups are fed together, animal groups can be merged, provided they receive the exact same feed.

All other settings depend on the selected "strategy". These settings are described in the following chapters.

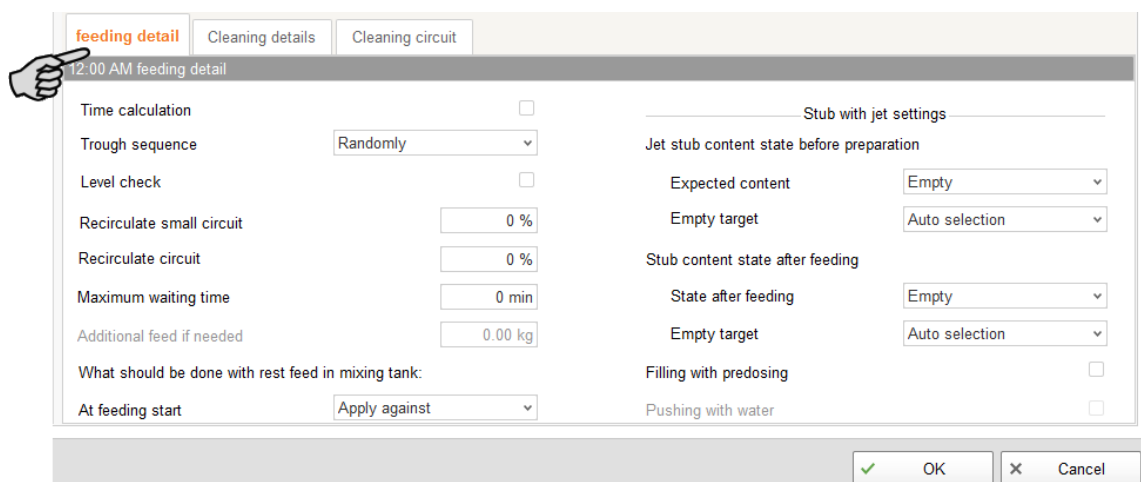
4.1.1 Feeding: restrictive liquid

When feeding is restrictive (strategy "restrictive liquid"), feed is mixed for the selected animals and then dispensed in a dosing process. Cleaning of the tank can be configured after feeding, see chapter 4.1.3 "Tank cleaning", page 108.

1. Carry out all introductory instructions in 4.1 "Defining a task".
2. Click on "Add" and provide the following information:



- **Time:** Start time of the feeding
 - **Feed amount:** Percentage of the daily demand; the shares must add up to a total of 100 %.
 - The box **Reserve time** (optional) should be checked if the remaining daily demand is to be fed during this feeding time.
3. To add another feeding time, click on "Add" again.
 4. Configure the settings in the lower part of the window under the "Feeding detail" tab:



- **Time calculation:** Check this box to determine the eating time after dosing.

- **Trough sequence:** This parameter determines the distribution sequence for the valves of a feed line. Available options for the distribution sequence are "Randomly", "Run of pipe" and "Manual" (sequence set manually).
- **Level check:** The fill level of the troughs is checked before feeding if this box is checked. Feed is only dispensed into empty troughs.
- **Recirculate small circuit:** This parameter determines if and for how long feed is recirculated in the small circuit before distribution. Enter the value in percent of the maximum recirculation time of the small circuit. Feed is recirculated once before distribution.
Feed is not recirculated if the value is 0 %.
- **Recirculate circuit:** This parameter is only applicable for circuits without residue-free feeding. The parameter determines if and for how long feed is recirculated in the circuit before distribution. Enter the value in percent of the maximum recirculation time.
Feed is not recirculated if the value is 0 %.
- **Maximum waiting time:** Maximum waiting time after preparation before distribution starts.
- **Additional feed, if needed:** This parameter is only applicable for systems without used water tank. This is the maximum amount of feed that may be mixed to reach the desired dry matter percentage.
- **What should be done with rest feed in mixing tank – At feeding start:**
 - "Apply against": The dry matter percentage is considered and the current mixture is adjusted.
 - "No consideration": The mixture is prepared according to the settings.
 - "Clear container": The contents are pumped into the used water tank before mixing starts.

The following setting parameters are applicable for branch lines (stubs) with jet:

- **Jet stub content state before preparation**
Expected content: This parameter determines the state of the branch lines with jet before feeding: "Empty" or "Feed". The current state of the branch line with jet is taken over from the expected state of the previous feeding.
 - "Empty": Before preparation, the branch lines with jet to be filled are emptied according to the settings under "Empty target".
 - "Feed" and branch line is empty: The additional feed is dispensed into the jet after mixing.

- "Feed" and branch line is filled with water: The branch line is emptied before mixing and then filled with feed.

Empty target: This parameter defines how the branch line with jet is emptied. The contents of the branch line are either emptied into the mixing tank, into the used water tank or automatically divided between the mixing tank and used water tank.

- **Stub content state after feeding**

State after feeding: This parameter determines the state of the branch lines with jet after feeding. The following options are available:

- "Empty": Branch lines with jet are emptied after feeding.
- "Feed": Branch lines with jet remain filled with feed after feeding.
- "Water": Branch lines with jet remain filled with used water after feeding (only for residue-free feeding).

Empty target: The target is the final branch line with jet. This parameter defines how the branch line with jet is emptied. The contents of the branch line are either emptied into the mixing tank, into the used water tank or automatically divided between the mixing tank and used water tank.

- **Filling with predosing:** This parameter is only applicable for branch lines with jet and for systems with used water tank. If this parameter is active, feed is pre-dosed in the branch line with jet, between the final physical valve and the end of the branch line. This applies to the following two configurations:

- The parameter "State after feeding" has been set to "Feed".
- The parameter "State after feeding" has been set to "Empty" and feed is dispensed at other feed lines during feeding, i.e. the feed intended for the other feed lines can be used to push the feed in the branch line with jet.

This parameter is not applicable (grayed out) for:

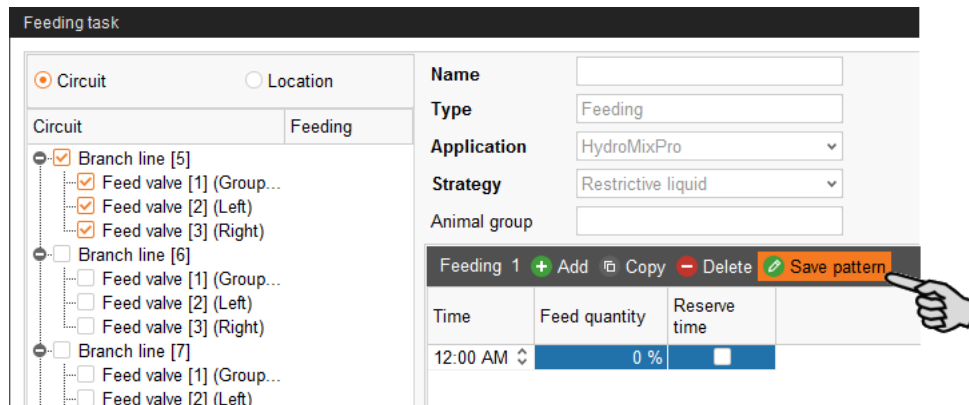
- systems without used water tank and
- systems with used water tank if the parameter "State after feeding" has been set to "Water".

- **Pushing with water:** This parameter is only applicable for branch lines with jet in systems without used water tank. If this parameter is active, feed in the final branch line with jet is pushed with water (during feeding). Feed is pushed with water if the water in use can be processed again for preparation.

This parameter is not applicable (grayed out) for systems without used water tank if the parameter "State after feeding" has been set to "Feed".

5. Save the created task as template, if necessary:

- a) Click on "Save pattern".



- b) Define a code and a description in the window "Save pattern".

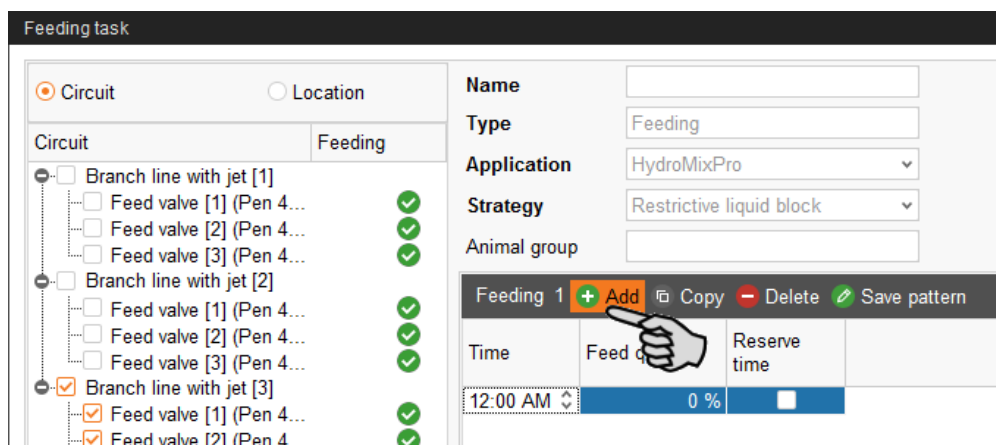
- c) Click on "OK" in the "Save pattern" window.

6. Click on "OK" after you have configured all settings.

4.1.2 Block feeding

In case of block feeding, feed is mixed and then dispensed for the animals in multiple "blocks" (rations). Block feeding differs from restrictive liquid feeding because multiple blocks are defined. The total amount of feed of all blocks must add up to 100 %. Between blocks, pause times may be defined.

1. Carry out all introductory instructions in 4.1 "Defining a task".
2. Click on "Add" and provide the following information:



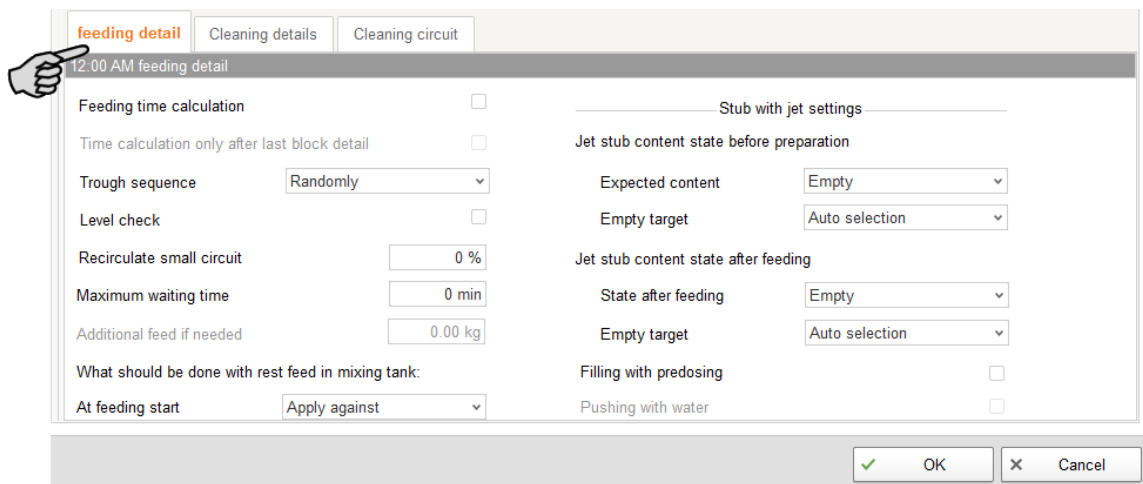
- **Time:** Start time of the feeding
- **Feed amount:** Percentage of the daily demand; the shares must add up to a total of 100 %.
- The box **Reserve time** (optional) should be checked if the remaining daily demand is to be fed during this feeding time.

3. Configure the settings for the individual blocks of the feeding time in the right-hand part of the window:

By default, three blocks are available for each feeding time. You can remove blocks or add further blocks.

The screenshot displays the configuration window for a feeding task. The top part includes fields for Name, Type (Feeding), Application (HydroMixPro), Strategy (Restrictive liquid block), and Animal group. Execution settings include a frequency of Daily, 1 day, and a date range from 12/20/2016 to 12/31/2099. Below these are controls for adding, deleting, and saving patterns. The main area is divided into a table of feeding blocks and a detailed view of the selected block. The table shows two blocks at 12:00 AM with feed quantities of 30% and 70%. The detailed view shows parameters for two blocks, such as 0% feed quantity, 0 min waiting time, 'Without mixing' state, and 'Slow' speed. A red box highlights the '+ Add' and '- Delete' buttons in the 'Feeding block details' header, and a hand icon points to the bottom of the details section.

- **Feed amount:** Percentage of the amount of feed to be fed in this block.
 - **Waiting time** until the next block starts.
 - **Mix state** includes the following options:
 - "Without mixing"
 - "Non-stop mixing"
 - "Interval mixing" – The parameters "Interval mix time" and "Interval pause time" become active with selection of this option.
 - **Speed** for mixing
 - **Interval mix time**
 - **Interval pause time**
 - **Mix time after pause:** If the mix time after pause has been set, the feed in the mixing tank is mixed up quickly before the next block.
 - **Recirculate circuit:** Applicable for circuits without residue-free feeding.
4. Configure additional settings in the lower part of the window under the "Feeding detail" tab:



feeding detail | Cleaning details | Cleaning circuit

12:00 AM feeding detail

Feeding time calculation

Time calculation only after last block detail

Trough sequence Randomly

Level check

Recirculate small circuit 0 %

Maximum waiting time 0 min

Additional feed if needed 0.00 kg

What should be done with rest feed in mixing tank:

At feeding start Apply against

Stub with jet settings

Jet stub content state before preparation

Expected content Empty

Empty target Auto selection

Jet stub content state after feeding

State after feeding Empty

Empty target Auto selection

Filling with pre-dosing

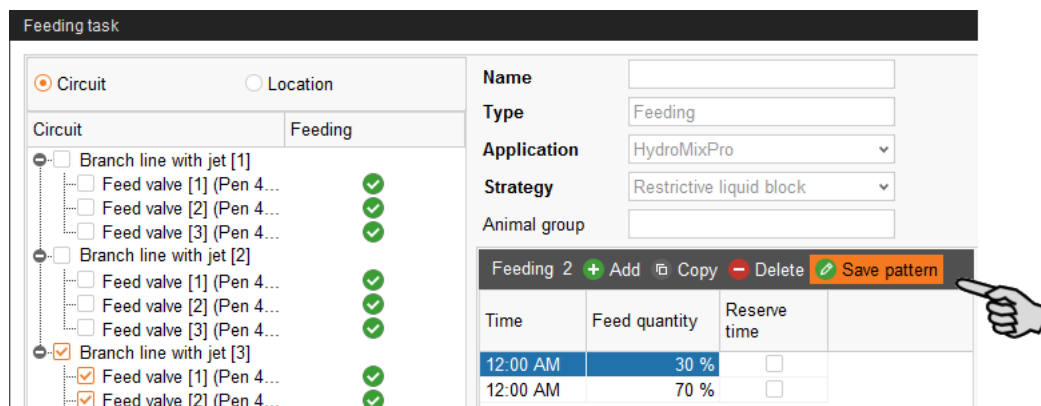
Pushing with water

OK Cancel

- **Feeding time calculation active > Time calculation only after last block detail:** The feeding time is only calculated after the last feeding block.

For all other parameter definitions, see chapter 4.1.1 "Feeding: restrictive liquid", page 102.

5. Define additional feeding times as described above, if necessary.
6. Save the created task as template, if necessary:
 - a) Click on "Save pattern".



Feeding task

Circuit Location

Circuit	Feeding
[-] Branch line with jet [1]	
[-] Feed valve [1] (Pen 4...)	✓
[-] Feed valve [2] (Pen 4...)	✓
[-] Feed valve [3] (Pen 4...)	✓
[-] Branch line with jet [2]	
[-] Feed valve [1] (Pen 4...)	✓
[-] Feed valve [2] (Pen 4...)	✓
[-] Feed valve [3] (Pen 4...)	✓
[+] Branch line with jet [3]	
[+] Feed valve [1] (Pen 4...)	✓
[+] Feed valve [2] (Pen 4...)	✓

Name

Type Feeding

Application HydroMixPro

Strategy Restrictive liquid block

Animal group

Feeding 2 + Add Copy Delete Save pattern

Time	Feed quantity	Reserve time
12:00 AM	30 %	<input type="checkbox"/>
12:00 AM	70 %	<input type="checkbox"/>

- b) Define a code and a description in the window "Save pattern".
 - c) Click on "OK" in the "Save pattern" window.
7. Click on "OK" after you have configured all settings.

4.1.3 Tank cleaning

The goal of this task is the cleaning of the tanks. Cleaning is configured in individual blocks. Each block stands for exactly one tank that must be cleaned. The tanks are cleaned continuously during the entered time. If no recirculation has been configured, the tanks are cleaned at the same time, if possible.

1. Carry out all introductory instructions in 4.1 "Defining a task".
2. Click on "Add" and enter the time for cleaning.

3. Create the cleaning block in the lower part of the window under "Cleaning details" using the "Add" button.

The number of blocks depends on how many tanks should be cleaned at the same time.

4. Configure the following settings for the block:
 - **Tank:** Selection of the tank to be cleaned.
 - **Emptying:** Information on if and when the tank should be emptied for cleaning. The tank contents are mixed up quickly before emptying based on the agitator curve.
 - **Emptying target:** Selection of the tank to be emptied.

- **Cleaning** refers to the selection of cleaning with water.
 - The **cleaning amount** of water should be greater than "Minimum clean amount", see chapter 3.4 "Feed preparation", page 76.
 - **Cleaning time** (parameter currently not in use)
 - **Fogger 1**: Should the first fogger be used for fogging of the tank?
 - **Fogger 2**: Should the second fogger be used for fogging of the tank?
 - **Fog time**: Duration of the fogging process. The foggers are started with a delay if fogging is carried out in another tank beforehand.
 - **Waiting time** after fogging. The tank to be cleaned is always rinsed with water ("Minimum clean amount") after the waiting time after fogging has elapsed.
5. Click on "OK" after you have configured all settings.

4.1.4 Circuit cleaning

This task defines circuit cleaning.

1. Carry out all introductory instructions in 4.1 "Defining a task".
2. Click on "Add" and enter the time for cleaning.

The screenshot shows a configuration window for a task. The 'Name' field is empty. The 'Type' is set to 'Feeding', 'Application' to 'HydroMixPro', and 'Strategy' to 'Cleaning circuit'. The 'Execute' dropdown is set to 'Daily'. The 'All' field is '1' and 'Days' is selected. The 'From - Until' dates are '12/20/2016' to '12/31/2099'. Below these fields is a table with a header row: 'Cleaning 2', '+ Add', 'Copy', and '- Delete'. A hand icon points to the '+ Add' button. Below the header is a 'Time' column with a dropdown menu showing '8:00 AM' and '10:00 PM'.

3. Create the circuit in the lower part of the window under "Circuit cleaning" using the "Add" button.

The screenshot shows a table titled 'Cleaning circuit' with a header row: '8:00 AM Cleaning circuit', '+ Add', and '- Delete'. A hand icon points to the '+ Add' button. Below the header is a table with the following columns: No., Circuit, Mixing tank, Agitator state, Target tank, Agitator state, Component, Clean amount, Dry matter below, and Min. content.

No.	Circuit	Mixing tank	Agitator state	Target tank	Agitator state	Component	Clean amount	Dry matter below	Min. content
1	Simple circuit [9]	Mixing tank [1]	Off	Mixing tank [1]	Off	Water	0.0 kg	50.0 g/kg	50 %

4. Configure the following settings for the circuit:
 - **Circuit**
 - **Mixing tank:** Source tank providing the component for cleaning.
 - **Agitator state:** Switching the source tank's agitator for cleaning.
 - **Target tank**
 - **Agitator state:** Switching the target tank's agitator for cleaning.
 - **Component** used for cleaning.
 - **Clean amount**
 - **Dry matter below:** This is the dry matter amount that may not be exceeded after filling the mixing tank if the mixing tank is used for cleaning. If the value is exceeded, the system does not move any cleaning components into the mixing tank, i.e. the circuit is not cleaned. A warning indicating that the dry matter percentage in the mixing tank is too high for circuit cleaning is issued instead.
 - **Minimum content:** This is the percentage of the cleaning component that should be in the mixing tank after filling if the mixing tank is used for cleaning. If this value is not reached, the system does not move any cleaning components into the mixing tank, i.e. the circuit is not cleaned. A warning indicating that the minimum percentage of cleaning component could not be reached is issued instead.
5. Click on "OK" after you have configured all settings.

4.1.5 Watering

This task defines watering of the animals.

1. Carry out all introductory instructions in 4.1 "Defining a task".
2. Click on "Add" and enter the time for watering.

Name	<input type="text"/>	Execute	Daily <input type="text"/>
Type	Feeding	All	1 <input type="text"/> Days
Application	HydroMixPro	From - Until	12/20/2016 - 12/31/2099
Strategy	Watering	Feed phase	<input type="text"/>
Animal group	<input type="text"/>		
Feeding 1 <input type="button" value="+ Add"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>			
Time	<input type="text" value="12:00 AM"/>		

- Configure the settings for watering in the lower part of the window under "Feeding detail".

- **Component** used for watering
 - **Fixed amount** defines the amount of liquid each animal receives for drinking.
- For all other parameter definitions, see chapter 4.1.1 "Feeding: restrictive liquid", page 102.

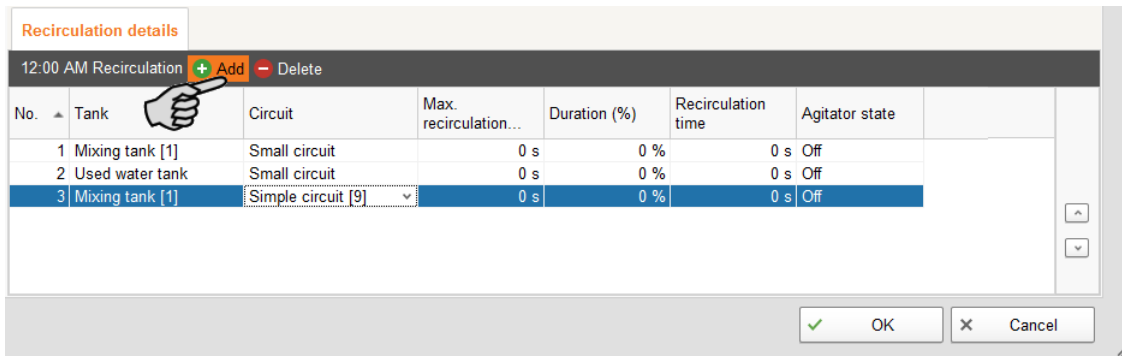
- If necessary, add more times for watering as described above.
- Click on "OK" after you have configured all settings.

4.1.6 Recirculation

This task defines recirculation of the used water and mixing tank's contents.

- Carry out all introductory instructions in 4.1 "Defining a task".
- Click on "Add" and enter the time for recirculation.

3. Create a recirculation process in the lower part of the window under "Recirculation details" using the "Add" button.

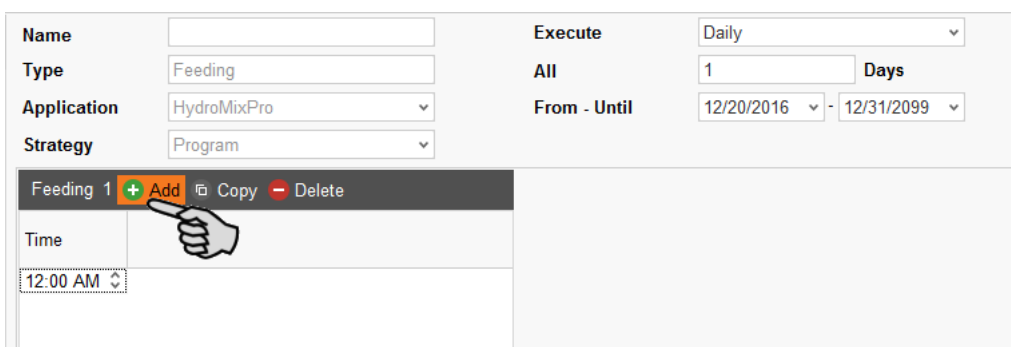


4. Define the tanks and configure the corresponding settings.
 - **No.:** Consecutive number
 - **Tank:** Selection of the tank for recirculation.
 - **Circuit** used for recirculation.
 - **Max. recirculation time:** Indicates the maximum recirculation time.
 - **Duration:** Share of the maximum recirculation time with recirculation.
 - **Recirculation time:** The resulting duration for recirculation.
 - **Agitator state:** Switching the agitator for recirculation.
5. If necessary, add more times for recirculation as described above.
6. Click on "OK" after you have configured all settings.

4.1.7 PLC program

The "Program" strategy is used to start PLC programs. Starting with a start sensor (manual start) is currently not supported. Specific parameters are therefore inactive (grayed out).

1. Carry out all introductory instructions in 4.1 "Defining a task".
2. Click on "Add" and enter the time for the program.



- Configure the settings for the program in the lower part of the window under "Program detail".

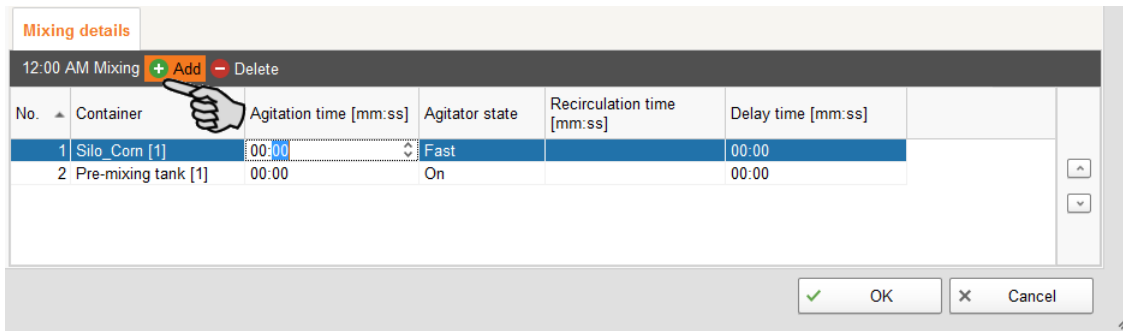
- **Program** defines the PLC program that is to be started.
 - **Start device** defines the output that must be set to start the PLC program.
 - **Cancel device** defines the input that must be set to end the PLC program.
- If necessary, add more feeding times for the program as described above.
 - Click on "OK" after you have configured all settings.

4.1.8 Mixing components

This task defines the mixing of components in silos and other containers. A separate mixing process can be defined for each silo or container. The processes are carried out at the given time consecutively, starting with the first process.

- Carry out all introductory instructions in 4.1 "Defining a task".
- Click on "Add" and enter the time for mixing.

3. Create a mixing process for a container in the lower part of the window under "Mixing details" using the "Add" button.

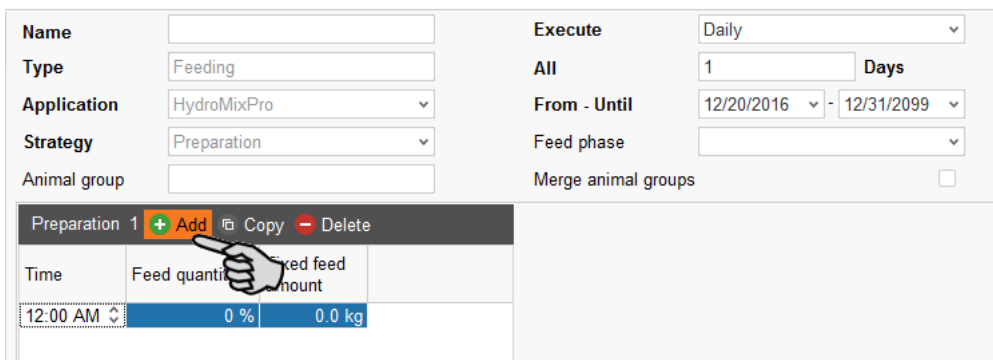


4. Define the silos and configure the corresponding settings.
 - **No.:** Consecutive number
 - **Container:** Selection of the container for mixing.
 - **Agitation time [mm:ss]**
 - **Agitator state:** Switching the agitator for mixing.
 - **Recirculation time [mm:ss]**
 - **Delay time [mm:ss]** Waiting time before the next consecutive process starts.
5. If necessary, add more processes for additional silos as described above.
6. Click on "OK" after you have configured all settings.

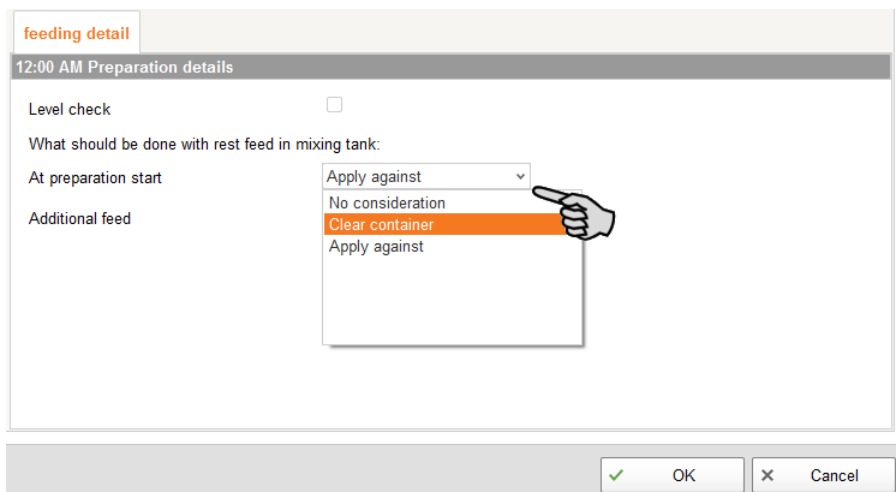
4.1.9 Preparation

The goal of this task is mixing a specific amount of feed in the mixing tank. However, this feed is not dispensed for the animals. The amount to be mixed results either from the animals' feed demand or is set as "Fixed feed amount". The feed composition is based on the selected animals. If the feed amount cannot be mixed, the task ends with an error message.

1. Carry out all introductory instructions in 4.1 "Defining a task".
2. Click on "Add" and provide the following information:



- **Time:** Start time of the preparation
 - **Feed amount:** Percentage of the daily demand; the shares must add up to a total of 100 %.
 - **Fixed feed amount:** This amount of feed is prepared.
3. Configure the settings for preparation in the lower part of the window under "Feeding detail".



- **Level check:** This request determines the valves for which mixing is actually necessary.
 - **What should be done with rest feed in mixing tank: At preparation start:**
 - "No consideration": The preparation amount is mixed as defined.
 - "Apply against": The dry matter percentage is considered and the current preparation amount is adjusted.
 - "Clear container": The contents are pumped into the used water tank before preparation starts.
 - **Additional feed** indicates the maximum amount that may be mixed additionally to reach the desired dry matter percentage.
4. If necessary, add more times for preparation as described above.
5. Click on "OK" after you have configured all settings.

4.1.10 Distribution

This task distributes the mixing tank content to the selected valves.

1. Carry out all introductory instructions in 4.1 "Defining a task".
2. Click on "Add" and enter the time and the feed amount for distribution.

Time	Feed quantity
12:00 AM	100 %

- **Feed amount** refers to the current content of the mixing tank. If the value is below 100 %, only this percentage of the content is dispensed.

3. Configure the settings for distribution in the lower part of the window under "Feeding detail".

For all parameter definitions, see chapter 4.1.1 "Feeding: restrictive liquid", page 102.

4. Click on "OK" after you have configured all settings.

4.1.11 Pre-mixing

This task defines fixed times for filling of a pre-mixer. The task "Pre-mixing" is carried out at the same time as other tasks, including other tasks with the "Pre-mixing" strategy.

1. Carry out all introductory instructions in 4.1 "Defining a task".

- Click on "Add" and enter the time for pre-mixing.

The screenshot shows the 'Task Manager' interface. On the left, there are several input fields: 'Name' (empty), 'Type' (Feeding), 'Application' (HydroMixPro), 'Strategy' (Premixing), and 'Animal group' (empty). On the right, there are more settings: 'Execute' (Daily), 'All' (1 Days), 'From - Until' (12/20/2016 - 12/31/2099), 'Feed phase' (empty), and 'Merge animal groups' (checkbox). Below these fields is a table with one row labeled 'Premixing 1'. The table has columns for 'Time' and 'Amount'. The 'Time' column contains '12:00 AM'. Above the table, there are buttons for '+ Add', 'Copy', and '- Delete'. A hand icon is pointing to the '+ Add' button.

- Configure the settings for pre-mixing in the lower part of the window under "Pre-mixing details".

The screenshot shows the 'Premixing details' dialog box. The title bar says 'Premixing details'. Below the title bar, there is a section for '12:00 AM Premixing'. The dialog contains several settings: 'Premixer' (dropdown), 'Amount specification' (Fixed amount), 'Fixed fill amount' (0.0 kg), 'Extra daily demand' (0.0 kg), 'Premix recipe' (dropdown), 'Adjust pre manual' (80.0 %), and 'Additional amount' (0.0 kg). At the bottom right, there are 'OK' and 'Cancel' buttons.

- **Premixer** defines the pre-mixer to be filled.
- **Amount specification:** The fill amount can be set as follows:
 - "Fixed amount": The pre-mixer is filled up to this amount.
 - "Full": The pre-mixer is filled to its maximum capacity.
 - "Daily demand": The remaining daily demand is calculated for the animals from the selected locations and for the selected animal groups. The pre-mixer is filled with this amount.
- **Fixed fill amount** defines the target amount for the specification "Fixed amount".
- **Extra daily demand** defines an amount to be mixed additionally for the specification "Daily demand".
- **Pre-mix recipe** defines the "pre-mix recipe" to be used for the pre-mixer. If no setting is made for this parameter, the recipe entered for the pre-mixer is used, see chapter 3.4 "Feed preparation", page 76.

- **Adjust (percentage of feed) pre manual (components):** Percentage of replacement components that are dispensed before the manual components. This allows reaching the desired dry matter percentage after manual components have been dispensed by adding the remaining replacement amount afterwards.
- **Additional amount** defines the additional mixing amount that is allowed as maximum to reach the dry matter percentage. If the contents are very aqueous, the desired dry matter percentage can be reached by adding the additional amount.

4. Click on "OK" after you have configured all settings.

4.1.12 Pre-mixing auto start

This strategy can only be executed once a day for each pre-mixer. The strategy has the same parameters as the "Pre-mixing" strategy. Additionally, this strategy defines whether the pre-mixer is filled when its weight falls below a certain value, or whether the pre-mixer is filled after pressing a start button.

1. Carry out all introductory instructions in 4.1 "Defining a task".
2. Click on "Add" and enter the time for pre-mixing auto start.

Name	<input type="text"/>	Execute	Daily
Type	Feeding	All	1 Days
Application	HydroMixPro	From - Until	12/20/2016 - 12/31/2099
Strategy	Premixing auto start	Feed phase	
Animal group	<input type="text"/>	Merge animal groups	<input type="checkbox"/>

Premixing 1	
Time	12:00 AM

3. Configure the settings for pre-mixing auto start in the lower part of the window under "Pre-mixing details".

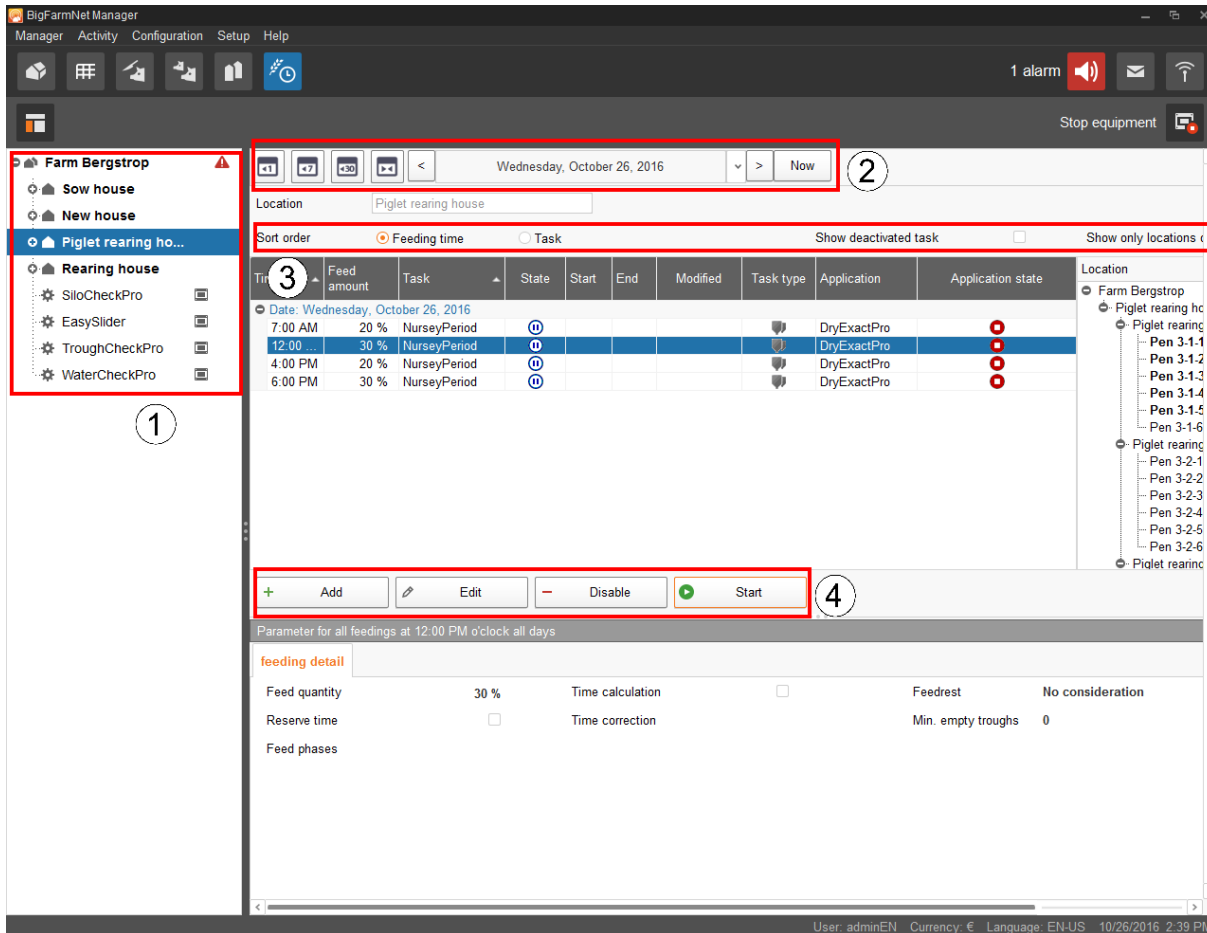
For all other parameter definitions, see chapter 4.1.11 "Pre-mixing", page 116. There are only three additional parameters.

Premixing details	
Premixer	<input type="text"/>
Amount specification	Fixed amount
Fixed fill amount	0.0 kg
Extra daily demand	0.0 kg
Premix recipe	<input type="text"/>
Adjust pre manual	80.0 %
Additional amount	0.0 kg
Start by amount	<input checked="" type="checkbox"/>
Amount for start	150.0 kg
Start manual	<input checked="" type="checkbox"/>

- **Start by amount:** If this box is checked, the pre-mixer is filled again automatically when the weight falls below the value given for "Amount for start". If the box is not checked, this process can only be started manually using a start button at the pre-mixer (hardware), see the parameter "Start manual".
 - **Amount for start** defines the weight from which the pre-mixer is filled again, provided that the box "Start by amount" is checked.
 - **Start manual** defines whether the pre-mixer is filled after the start button at the pre-mixer is actuated. The input "Start button" of the pre-mixer must be connected with the IO card in the IO Manager.
4. Click on "OK" after you have configured all settings.

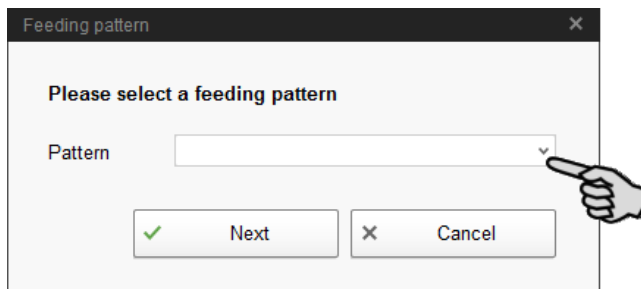
4.2 Editing a task

Feeding tasks are shown with their respective feeding details in the application window as soon as they have been created. The following functions are available:

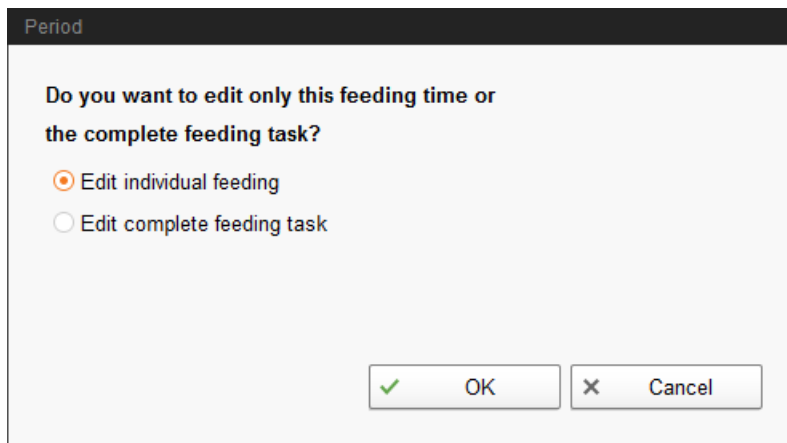


1. If necessary, filter the tasks according to location using the farm structure. Click either on the respective location or directly on the system.
On the farm level, all tasks of all systems are displayed.
2. Select a time period, if necessary.
 - Tasks of a specific day, week or month, respectively, can be shown.
 - You may also select individual days or a specific time period, as desired.
 - Click on "Now" to get back to the current day.
3. Modify the task view as required.
 - Sort the task view according to "Feeding time" or according to "Task".
 - Activate the function "Show deactivated task", if required.

- Activate the function "Show only locations of this feeding time", if required. Drag the horizontal scroll bar at the bottom all the way to the right to see the hidden part of the window.
4. Use the following functions to edit individual feeding times. First, select the correct feeding time by clicking on it.
- "Add": Add new tasks with this function.
- If you have created a template (pattern) at some point, you will be asked for a pattern. Select the correct pattern from the drop down menu, if applicable, or select "[Edit value is Null]" to create a new task. Click on "Next".

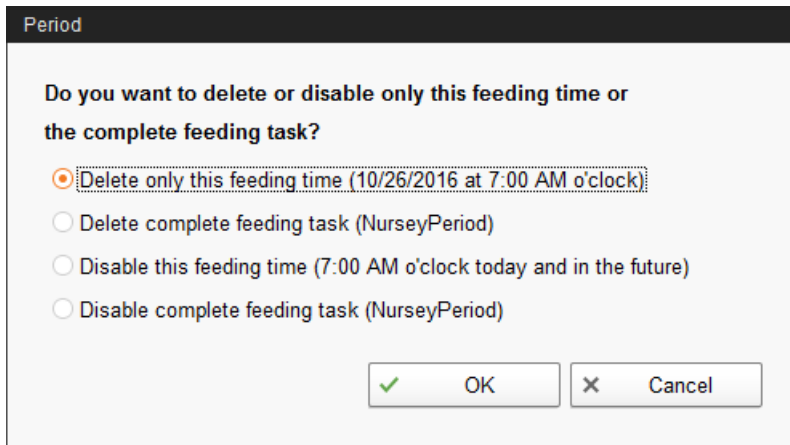


- "Edit": Use this function to either edit the selected feeding time or the entire task it belongs to.
- Select the correct option and click on "OK".



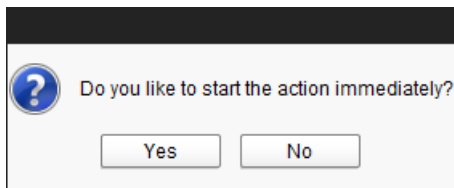
- "Disable": Use this function to disable or delete the selected feeding time or the entire task it belongs to.

Select the correct option and click on "OK".



- "Start": Use this function to start feeding immediately, even if a different feeding time has been saved for the task.

Confirm immediate start by clicking on "Yes".



5 Silo Manager

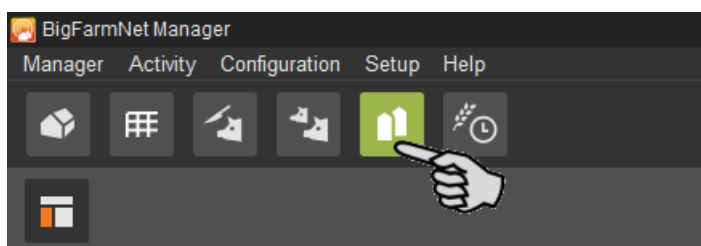
5.1 Overview

With the Silo Manager, you can monitor and manage the data of all your silos.

The Silo Manager offers the following functions:

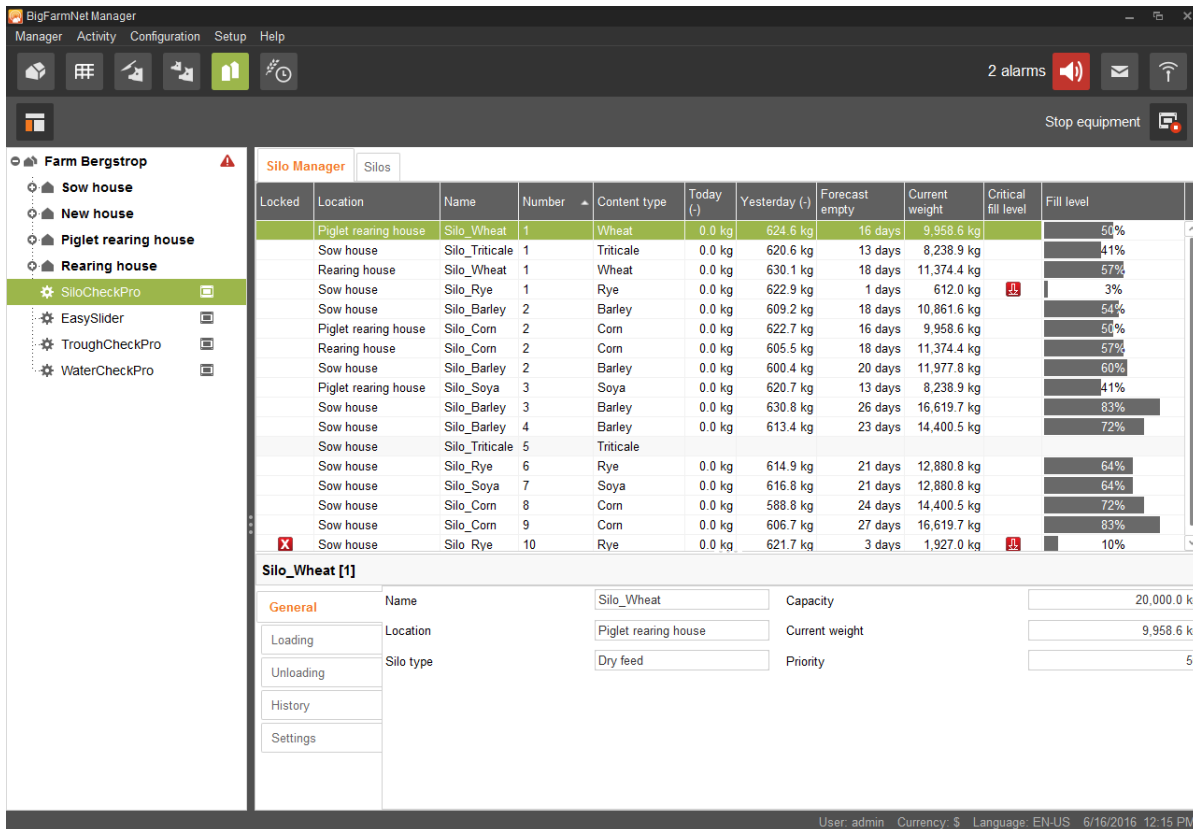
- register the amounts of feed unloaded from the silos
- calculate the expected storage duration of the silo contents
- receive a warning when a silo requires filling
- manage suppliers and prices for each feed component
 - BigFarmNet automatically calculates the total delivery amounts and your feed costs based on this information.

Open the Silo Manager by selecting the management area.



The tab "Silo Manager" opens in the application window. The table shows the current data for your silos:

- location and name of the silo
- the feed component contained in the silo
- the amounts of feed removed on the current day "Today" and the previous day "Yesterday"
- the time of the next expected silo filling under "Forecast empty"
- the current weight
- information on the fill level as a graph and as a percentage



You may change the order of the silos based on the table's parameters. If you click on "Forecast empty", for example, the silos are sorted in ascending order according to the time of the expected next loading, starting with the lowest number of days.

The silo locations were defined during configuration of the system. If you click on a house in the farm structure, you will only see the silos of this house.

5.2 Silo data

Additional silo data is displayed in the lower part of the application window based on the following categories:

- General
- Loading (delivery)
- Unloading (consumption)
- History
- Settings

In the categories "Loading" and "Settings", it is possible to edit the data of the individual silos.

General

The "General" category shows general information on the selected silo.

Silo_Corn [1]				
General	Name	Silo_Corn	Capacity	20,000.0 kg
Loading	Location	Sow house	Current weight	16,619.7 kg
Unloading	Silo type	Dry feed		
History				
Settings				

Loading (delivery)

The category "Loading" shows the previous deliveries for the selected silos.

You may add, edit or delete deliveries here. You can also export the data as .csv or .xlsx file for further use if you click on the "Export" button.

Silo_Corn [1]							
General	Date	Content type	Supplier	Delivery number	Price	Total cost	Amount
Loading	5/9/2016 2:00 AM	Corn	East Pig Food	10120	0.33EUR/kg	3,044.08 EUR	9,147.0 kg
	4/30/2016 2:00 AM	Corn	East Pig Food	10121	0.40EUR/kg	3,681.04 EUR	9,133.0 kg

Proceed as follows to add a delivery:

1. In the table, click on the silo you want to edit.
2. Under the category "Loading", click on "Add".
3. Complete the information in the next window:
 - Supplier (mandatory)
 - Delivery number
 - Delivery date
 - Amount and component (mandatory)
 - Dry matter percentage
 - Price

- Total cost (calculated automatically if information on the price and amount is entered)

4. Click on "OK" to accept these settings.

Unloading (consumption)

The "Unloading" category shows all quantities of feed removed from the selected silo up to now.

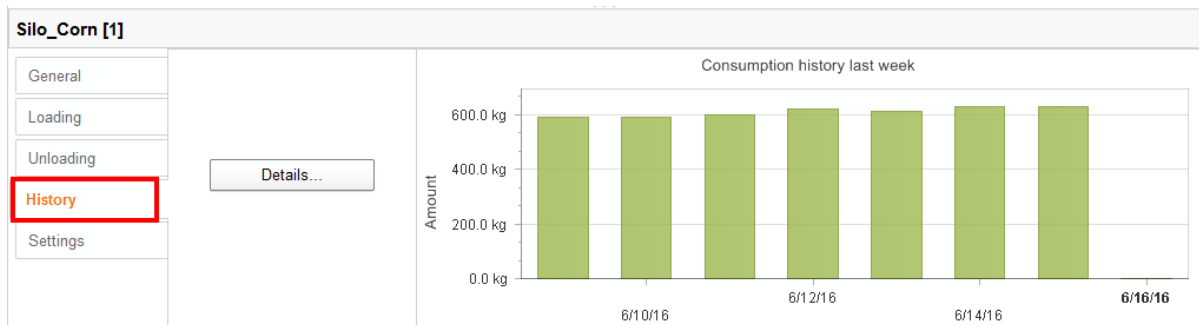
You may export the data as .csv or .xlsx file for further use if you click on the "Export" button.

Silo_Corn [1]				
General	Date	Location	Content	Amount
	6/15/2016 11:26 PM	Sow house	Corn	313.8 kg
Loading	6/15/2016 1:14 PM	Sow house	Corn	313.8 kg
	6/14/2016 11:20 PM	Sow house	Corn	315.1 kg
Unloading	6/14/2016 12:15 PM	Sow house	Corn	315.1 kg
	6/13/2016 9:25 PM	Sow house	Corn	203.8 kg
History	6/13/2016 5:27 PM	Sow house	Corn	203.8 kg
	6/13/2016 12:49 PM	Sow house	Corn	203.8 kg
Settings	6/12/2016 10:11 PM	Sow house	Corn	310.1 kg
	6/12/2016 1:10 PM	Sow house	Corn	310.1 kg

Export

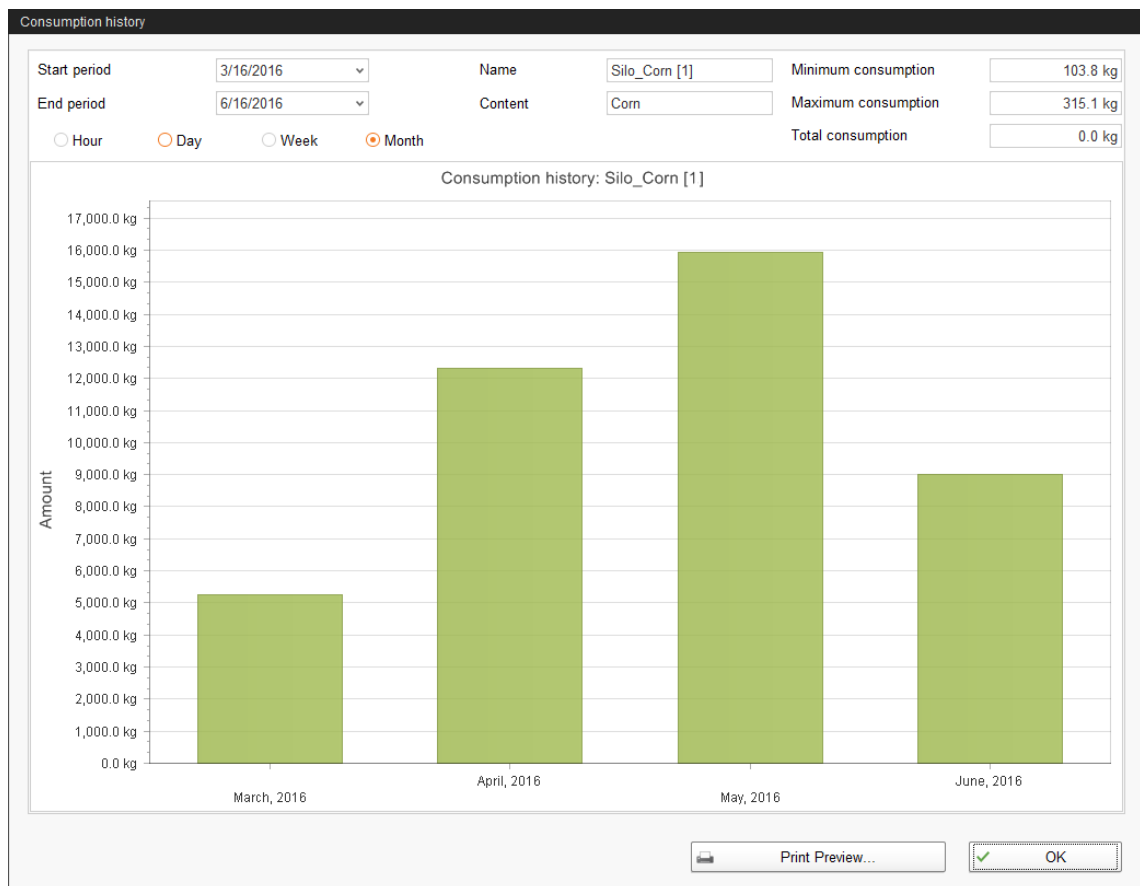
History

All feed removed from the selected silo in the past seven days is displayed in the "History" category as a bar chart.



Clicking on the "Details" button opens the "Consumption history" window. You may select the time period for the consumption history freely and with more details in this window.

1. Under "Start time" and "End time", enter the desired dates.
2. Select a time period: Hour, day, week or month.
3. Clicking on the "Print Preview" button opens a print preview to print out the data.



Settings

The "Settings" category show the basic data of the selected silo.

Proceed as follows to change the settings:

1. In the table, click on the silo you want to edit.
2. Under the category "Settings", click on "Edit".
3. Change the following settings, if necessary:
 - Name of the silo
 - Components or recipes mean the content of the silo
 - Capacity of the silo
 - Warning amount (relative) or warning amount (absolute): If you enter one of these values, the other one is calculated automatically.
The relative warning amount refers to the silo's capacity.
 - If the silo weight falls below the (absolute) warning amount, an alarm for a critical fill level is generated.
 - Priority: Use this function to prioritize the silos. The higher the value, the earlier the system uses components from this silo.
 - "Tara" is used to set the weighing system of the silo to zero. This is only possible if the silo is completely empty.

Silo settings: Silo_Soya [2]

Name	Silo_Soya	Capacity	20,000.0 kg
Components	Soya	Warning amount (relative)	10.0 %
Recipes		Warning amount (total)	2,000.0 kg
Weighed	<input type="checkbox"/>	Priority	50
Lock outlet	<input type="checkbox"/>	Tara	Tare
Unlock outlet automatically	<input type="checkbox"/>	Last tara date	1/1/1970

OK Cancel



BigFarmNet automatically blocks a silo whose content has been completely used up.

After each delivery, check whether the box next to "Block outlet" has been checked by BigFarmNet and if necessary remove the check.

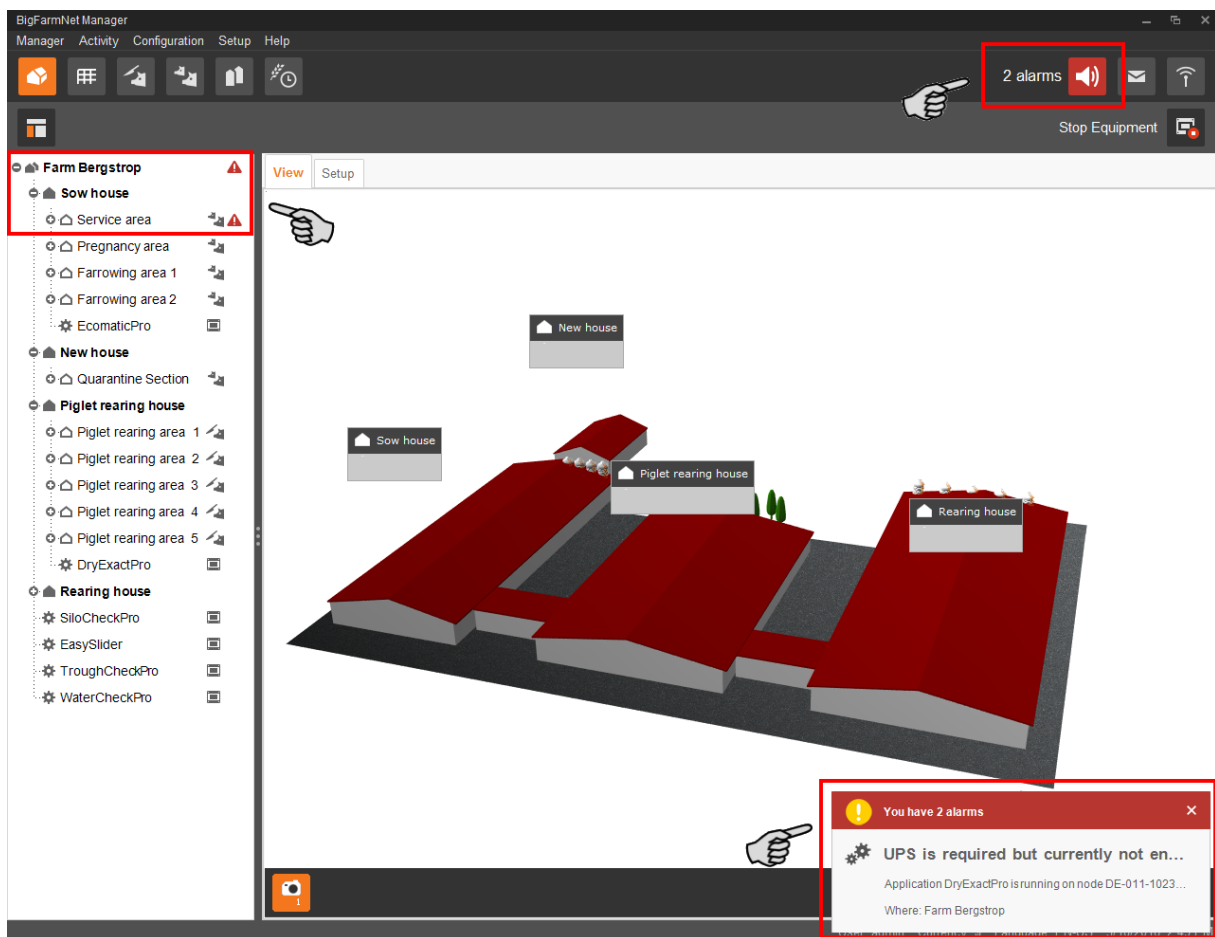
4. Click on "OK" to accept these settings.

6 Alarms

An alarm is triggered when the set values are not met during operation or when there are malfunctions. Warnings are also counted as alarms. Alarms are first registered by the control computer. The control computer then sends the alarm message to the BigFarmNet Manager.

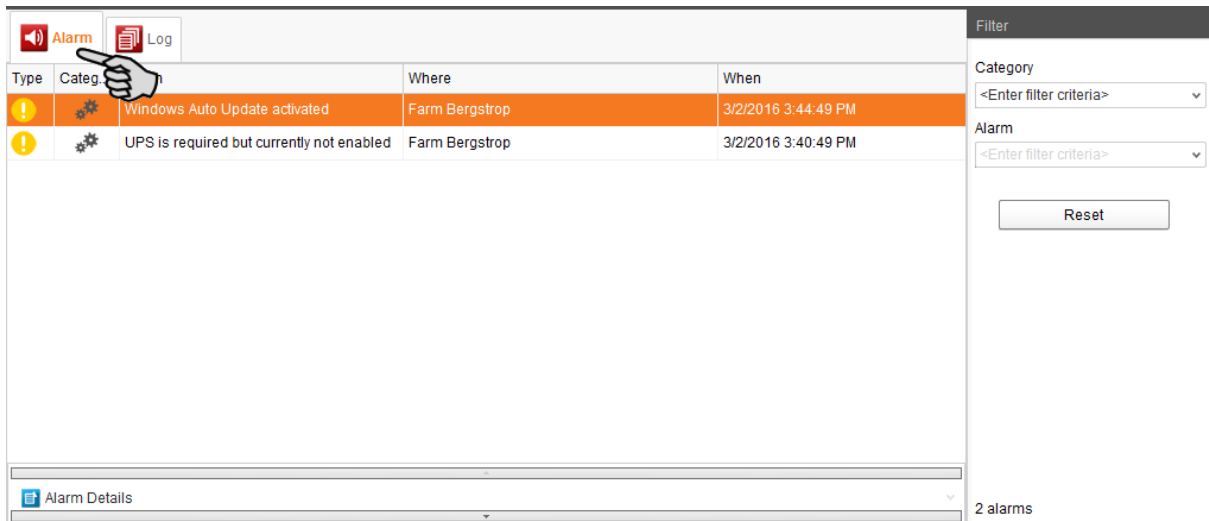
The BigFarmNet Manager indicates alarms as follows:

- Pop-up window: The window appears as soon as an alarm is registered, irrespective of the application the user is currently working in.
- Farm structure: Locations with a current problem are marked with a triangle in case of an alarm and with a circle in case of a warning.
- Tool bar: The number of alarms is shown next to the alarm icon.



Click on the pop-up window or the alarm icon in the tool bar to open the "Alarm" tab in the application window. The "Alarm" tab lists all active alarms and warnings.

If you click on a location with alarm or warning icon in the farm structure, the "Alarm" tab only shows problems active in the respective location.










The different alarms and warnings are shown in a list and ordered depending on when they occurred. The table columns contain the following information:


- Type: Alarm type
- Category: Alarm category
- Alarm: Alarm cause
- Where: Location of the alarm
- When: Time of occurrence

Alarm types

Icon	Status	Description
	Active alarm	Not acknowledged: Cause still exists.
	Inactive alarm	Not acknowledged: Cause no longer exists.
	Deactivated alarm	Acknowledged: Cause still exists.
	Ended alarm	Acknowledged: Cause no longer exists.
	Active warning	Not acknowledged: Cause still exists.
	Ended warning	Acknowledged: Cause no longer exists.
	Info	Information about an incident that has occurred.

Alarm categories

Icon	Category
	Climate: temperature, humidity
	Control, IO connection or test (system-specific)
	BigFarmNet system or CAN bus
	Dry feeding
	Liquid feeding
	SiloCheck system
	WaterCheck system

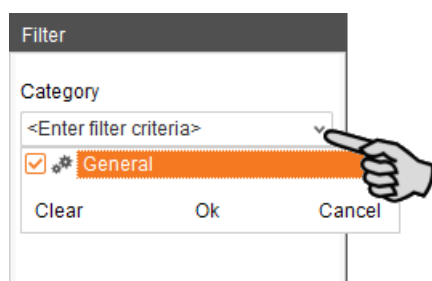
	Always eliminate causes for alarms in the "Climate" category first.
---	---

6.1 Filtering alarms

Alarms can be filtered according to category as well as cause.

1. In the right-hand part of the window under "Filter", open the drop-down menu listing categories.

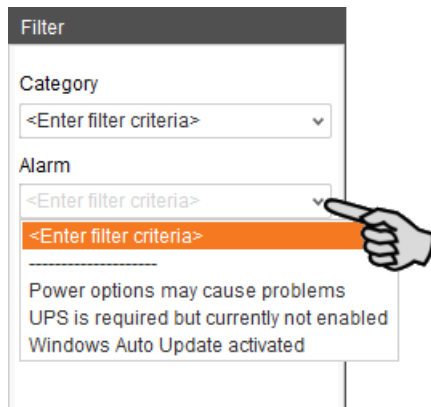
By default, all categories are selected.



2. Click on "Clear" to delete all check marks.
3. Check the boxes of the correct categories.
4. Click on "OK" to accept this selection.

- Under "Alarm", select the desired alarm cause from the drop-down menu.

The table then shows the desired alarms.



- To deselect the alarms, click on "Reset".

The table now lists all alarms.

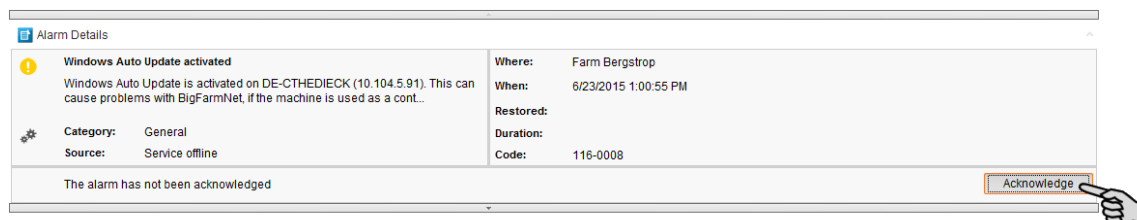
6.2 Acknowledging an alarm

Alarms can be acknowledged their cause has been eliminated. The alarm is marked with the corresponding icon (see alarm types) in the table and the system no longer requires action from the user.

- Click on the alarm you want to acknowledge to mark it.
- Click on "Alarm details" in the bottom part of the application window.



- Click on "Acknowledge".

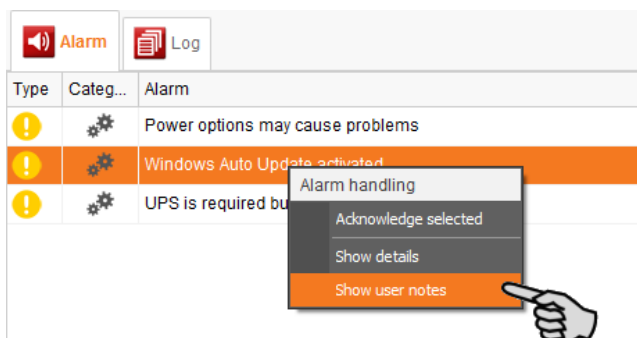


- Click on "Acknowledge" again in the next window.
- If necessary, leave a note on the alarm.

This note may be helpful to later eliminate similar alarms.

- a) Click on the alarm for which you want to leave a note to mark it.
- b) Right-click to open the context menu and click on "Show user notes".

The window "User notes" opens in the lower part of the application window.




- c) Enter your note into the field "Feedback" or "Corrective action".



- d) Click on "Save".

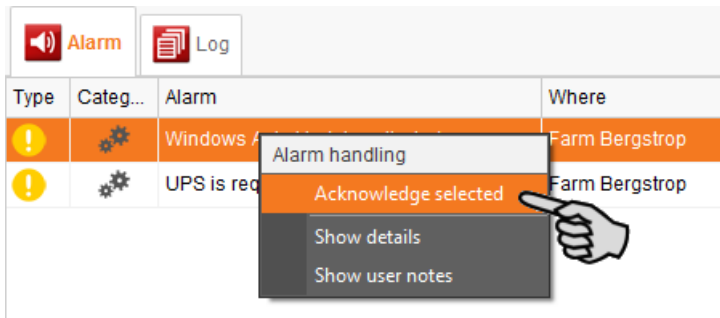
Or:



You can also acknowledge multiple alarms at the same time. Use the following key combination to select the respective alarms:

- To select a group of consecutive alarms: Click on the first alarm, press and hold the Shift key and then click on the last alarm you want to select.
- To select multiple alarms individually: Press and hold Ctrl and click on each alarm you want to select.
- To select all alarms: Press and hold Ctrl and then press A.

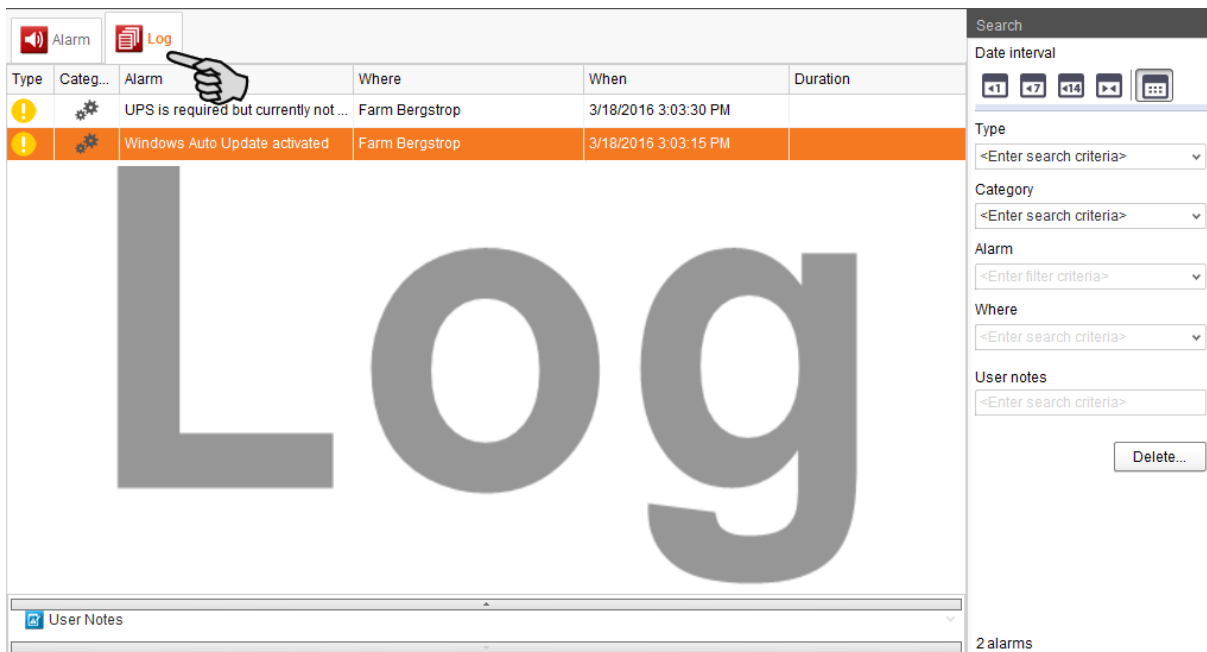
1. Select one or more alarms.
2. Right-click to open the context menu and click on "Acknowledge selected".



3. Click on "Acknowledge" in the next window.

6.3 Alarm log

The "Log" tab shows all alarms which have occurred since initial operation of the BigFarmNet Manager on your farm.

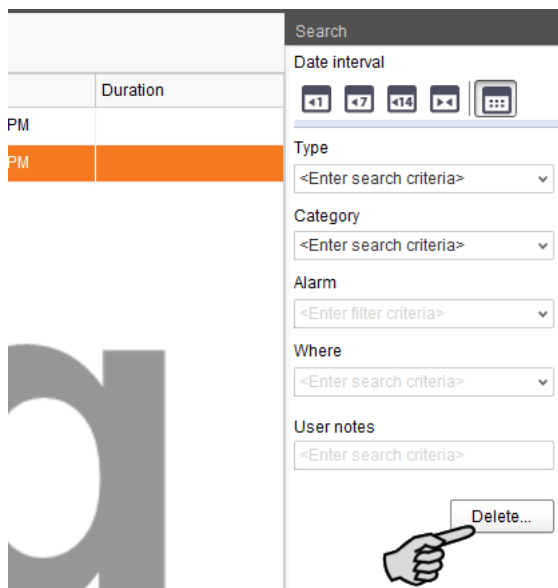


Use the search function to view selected alarms in this tab. The following search options are available in the right-hand part of the window under "Search":

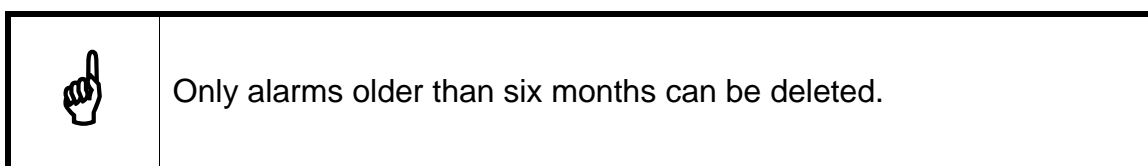
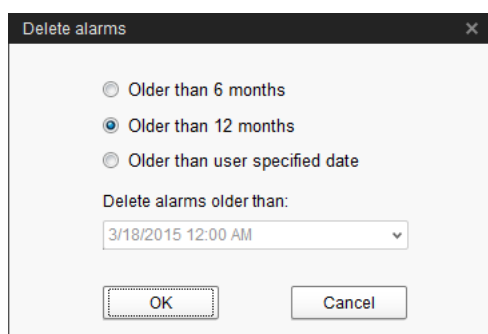
- Date interval: Time periods during which alarms may have occurred
- Type: Alarm type
- Category: Alarm category
- Alarm: Alarm cause
- Where: Location of the alarm
- User notes: provided user notes have been left

Deleting alarms

1. Click on "Delete..." in the right-hand part of the "Log" tab.



2. Click on the desired time period or enter a date.



3. Click on "OK".

All alarms of the selected time period are deleted, irrespective of whether specific alarms are currently selected via the search function.

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