

SAFETY AND CONTROL SYSTEMS

The intensification of fish farms results in higher stocking densities. The new systems that have been developed make this possible.

Where life support systems such as aerators are necessary, problems result from power cuts or other accidental interruptions.

In order to keep safe the fish stock and the investment from the interruption of life support, it makes sense to install a monitoring system. Commonly, simple alarm

systems are installed which are triggered by power cuts, and linked to emergency power generators. Unfortunately, these systems alone cannot guarantee the safety and well being of the fish stock. For example, if an oxygen supply pipe is broken, this will not register with the alarm.

So, despite a functioning supply system, dissolved oxygen can fall to dangerous levels, stressing the fish. This could result in disease problems later. In the worst case, this could lead to a complete loss

of fish stock. Complete, and permanent control of the dissolved oxygen levels of ponds, using in-pond oxygen probes, offers much more security.

With this concept in mind, LINN Germany has developed a comprehensive monitoring and control system. LINN Aqua-Control now works at more than 200 fish farms in Europe!



Handy instruments

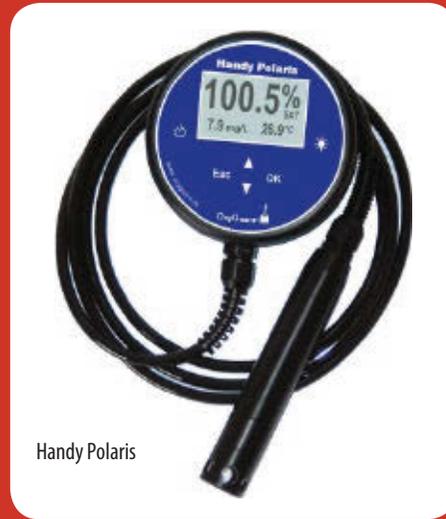
Handy Polaris

Portable instrument for measuring dissolved oxygen. Works with a probe with membrane and electrolyte (Clark Sensor) and microprocessor controlled electronics.

Handy Polaris has a large display, you can choose which parameter should be shown in large figures.

Handy Polaris has also automatic calibration, an automatic probe check and a choice of language!

It is the easiest Handy to use, and is supplied with a carrying wallet, maintenance kit and instructions.



Handy Polaris

Handy Polaris 2 is designed as an advanced solution for dissolved oxygen and temperature measurements with data logging. Based on Polaris functionality, Polaris 2 includes a datalogger with up to 99 memory blocks and 3000 memory cells and data can be transferred to a PC using a USB link which is purchased separately.



Handy HI 9147

The **Handy HI 9147** is made by the Hanna company, and is an inexpensive oxygen meter. The instrument has a waterproof casing and a galvanic oxygen probe (complete with 4 m cable). The oxygen measurements are expressed as percentage saturation or mg/l. This instrument also measures temperature and has automatic temperature compensation. The display can also be illuminated, for use in low light conditions.

The **HI 9147** comes complete with replacement membranes, O-rings, electrolyte and a transport case.



pH checker

pH checker

This pocket instrument makes measuring pH easy! It is calibrated automatically with standard buffers, and is then ready for use. No calibration fluid is necessary.

The pH-value (0-14) is indicated, and is readable to one decimal place. In addition to the pH-value, temperature is also measured (automatic temperature compensation) and indicated simultaneously on the display.

The device is waterproof and only weighs 85 g. An inexpensive spare electrode can be supplied, and is easy to replace.

This pH checker offers the capability for fish farmers and hobbyists to determine the pH-value of their ponds quickly and reliably.



Handy HI 9147

Aqua-Control One

Compact monitoring system for single stationary oxygen measurement



Dryden oxygen probe



230 V - Version with Dryden probe



optical oxygen probe

The Linn company has manufactured effective oxygen monitoring and control systems with 4 or more probes for many years. During this time, our customers have often asked us to produce a reliable, but cheap device to measure dissolved oxygen in a single pond.

This new system, the Aqua Control One, is the answer!

It is delivered complete and ready for use. At the heart of the system is the control unit, which is enclosed in a splash-proof enclosure. This can easily be hung in the desired position. All that is necessary is to connect to the power supply (230 V 1 ph or 400 V 3 ph), and suspend the oxygen probe in the pond or water to be monitored. The display will show the current dissolved oxygen level, in percentage saturation, continuously. Aqua-Control One is now available with two different oxygen probes. In addition to the already well-known probe (Clark sensor with membrane and electrolyte), a version with optical oxygen probe is now available.

All probes are equipped with 5m cable and plug and can be quickly and easily connected to the system.



Once the probe has been calibrated in air (which only takes a few minutes) it is then submerged in the water to be monitored, and instantly gives a reading.

The electronics of Aqua-Control One contains two potential-free relay contacts which can be used to connect to an alarm

system and to control/switch a machine (e.g. water aerator or pump). A switched socket (230 V 1 ph) or CEE socket (400 V 3 ph) is already integrated - a device can be plugged in here, which is then controlled according to your wishes and the oxygen level in the pond.

400 V - Version with Dryden probe



**available in
4 versions**

Linn's Aqua Control One offers an inexpensive, ready-to-use, durable solution for the monitoring of dissolved oxygen and control of equipment in ponds. Also suitable and affordable for Hobby – and koi pond owners, with the reassurance that it has been field- tested by expert fish farmers.

Aqua Control One is compact and portable and therefore flexible. It can be moved around to where it is most needed at the time, if it is not possible to monitor every pond.

230 V-Version with optical probe



**NEW! Aqua Control
One with optical
oxygen probe**



Aqua-Control – Monitoring and Surveillance System

... Total control and increased safety in your fish farm
... life insurance for your fish

Aqua-Control

LINN Aqua-Control has developed to provide the complete monitoring/control/regulation of your fish farm - combined with complete software for all necessary data and readouts. The software is individually created by us for your farm from a variety of modules (e.g. module pond book or manual feeding). All changes in your farm are automatically recorded or can be easily and simply implemented with a mouse click!

The heart of the system is a programmable logic controller (PLC) from the industrial sector. The combination of different inputs from a modular system makes it possible to achieve almost any desired function. Each system is a bespoke solution created according to specific customer requirements.



Example of a screen view

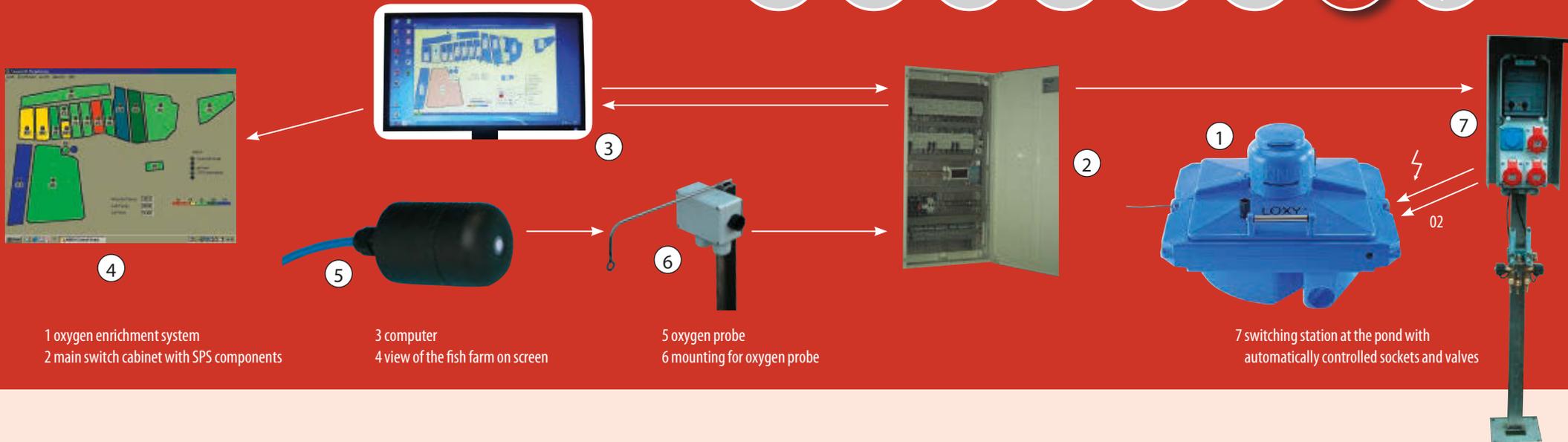
The main task of the control system is to keep the oxygen content at a pre-set level. The actual state is constantly measured by the probe hanging in the pond and compared with the target value. If the level falls below the set value, the oxygen enrichment or aeration system starts automatically and supplies oxygen to the water until the desired set value is reached again. If the oxygen content drops to the „critical value“, an alarm is triggered. The alarm message can be as provided as necessary eg. email/text etc.

In principle, any environmental factor that can be converted into electrical signals by means of probes or switches can be reported or directly triggered as a control measure. For example, the monitoring of water levels and/or the control of frequency converters are popular solutions for our customers.

Individual programmability of the control system allows all conceivable control operations to be carried out such as: cleaning screens every hour; pumping water from pond A to pond B every morning from 6 a.m. to 8 a.m., etc.

All Aqua-Control systems are equipped with a remote maintenance module. This makes subsequent adjustments or servicing easy and with no costly travel (by fitters).

The control system has a modular design. In addition to the actual "brain", which processes the program, smaller control boxes can be set up remotely across the site, which pick up probe signals and carry out switching functions. The connection between the switch boxes is made via a field USB similar to a type of telephone line.



This saves the laborious laying of large quantities of underground cables. Distances of several hundred meters are no problem, so that even large fishing enterprises can be economically wired.

A further advantage is the easy expandability of the control system. If, for example, new ponds are created, a further module is added to the PLC and the program extended accordingly. In this way, the equipment of a pond system can be divided into several construction stages at no extra cost.

The interface between man and machine is realized with a standard PC. The handling and adjustment is very simple. The PC is used to establish pre-set levels and to display the actual conditions. However, oxygen regulation is provided through a fail-safe system guaranteed at all times – even in the event of a “computer crash”!

In addition the computer serves also as long-term memory. By cyclically querying the values in the PLC, oxygen concentrations or temperature levels can be recorded over many years and displayed as a curve. The amount of data is small by today’s standards.

The main screen of the operating program is normally the visual display of your pond system.

The pond surfaces change their colour depending on the oxygen content, so that the condition of all ponds can be recorded at a glance. The current values are also listed. Switching states of pumps and valves can be displayed by different symbols.

Changes to the operating mode or target values can be made directly in the pond area with a simple mouse click. After confirmation, the new parameters are

transferred directly to the PLC and are active with immediate effect. All in all, operation is no problem even for computer novices.

LINN Germany is your partner providing solutions for all the control and safeguarding

requirements of complete production systems. The software has been created by us to meet your demands. Thus we can provide everything in one place. We are pleased to have provided more than 200 installations for our system Aqua-Control in Europe!



Aqua-Feed – Module Feeding

With the **Aqua-Feed** module (integrated in the Aqua-Control monitoring system) it is possible to control and monitor your feeding from your PC.

All LINN Feeders can be operated individually with a LINN feeding clock attached to the feeder. However the central control via our software module Aqua-Feed is much more effective and efficient.

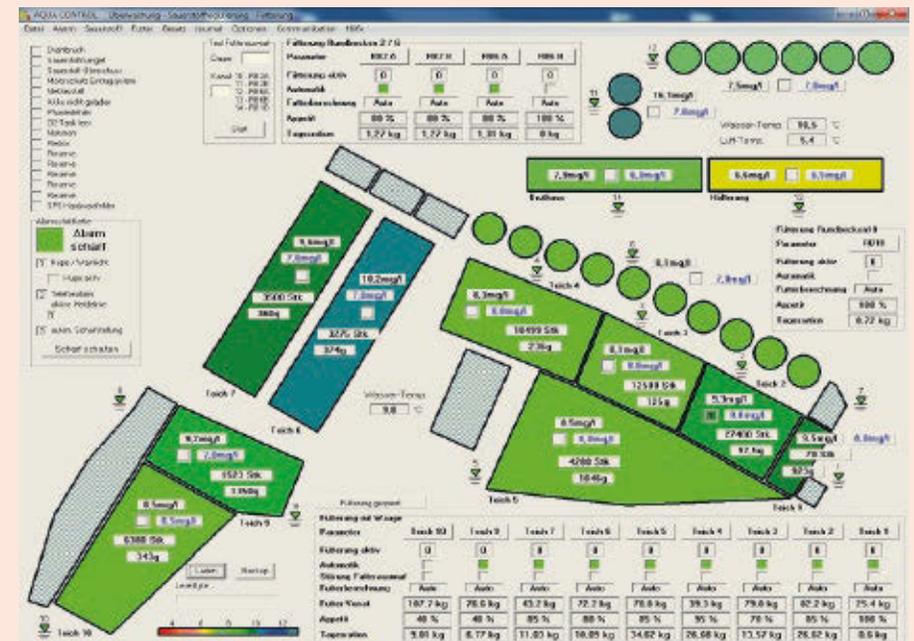
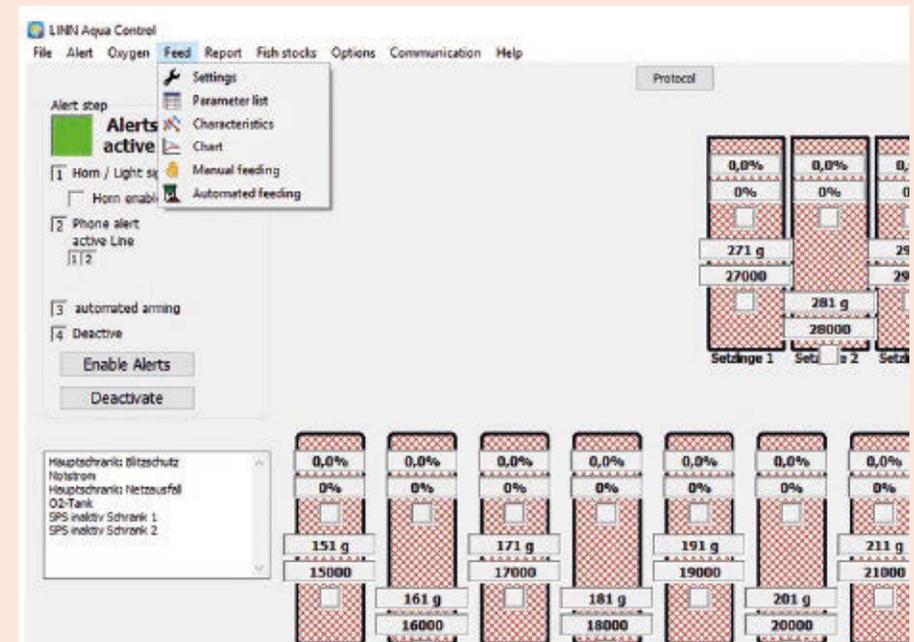
Using **Aqua Feed** the feed clocks on the Feeder are no longer required. You have the capacity to make all inputs and changes regarding the feeding of whole pond systems in comfort from the computer.

The conditions on your pond can be integrated into the software in the same way as your own experience using manual inputs. A pond data system is integrated in our software. At the click of a mouse, you always get a precise insight into the data and values of the individual ponds and have a precise overview of your fish stock at all times.

After each feeding the growth of the fish is calculated exactly and the next feeding is adapted to the increased fish weight. So your fish will always be fed optimally! In addition, all data is stored, so that you can still trace the feeding of individual ponds over a period of time and thus draw conclusions about the feed conversion and the growth of the fish.

Even if you still want to feed by hand, you can use the Manual Feeding Option in our software Aqua-Control. Our software creates a feeding regime for each pond according to the fish stocking. After feeding you can accept this recommendation by mouse click. The increase is then automatically calculated and the next feeding regime is adjusted accordingly.

Feeding is of course oxygen-dependent and/or temperature-dependent. In this way you achieve the best feed conversion. Our software contains reference values for all settings, however you can adapt these based on your own targets and experience by a simple mouse-click!





Characteristics

Feed rate and expected FOR for average weight:

Average weight [g]	Feed rate [%]	expected FOR
0,2	2,50	0,50
2	2,00	0,60
20	1,70	0,70
100	1,50	0,75
200	1,30	0,80
300	1,20	0,85
400	1,10	0,90
1000	0,90	1,00
3000	0,70	1,20
5000	0,50	1,50

Correction for Water temperature:

Temperature [°C]	Factor
3,0	0,40
5,0	0,41
7,0	0,46
9,0	0,55
11,0	0,66
12,0	0,75
14,0	0,90
15,0	1,00
16,0	0,90
17,0	0,80

Assisted calculation:
 Metabolic maximum [°C]: 15,5
 Temp. dependence [1/°C]:
 < Max. 0,5
 > Max. 0,5
 Range min. [°C]: 2
 Range max. [°C]: 10
 Calculate

Buttons: Accept, Close

Automated feeding

Single Feeding: Determine quantity of feed eject. Becken 2 Start

Station (kg): 0 Activated feeder for 1 minute

No	Name	amount of fish	species	fish weight [g]	Feed	Batch no.	Adjustment factor [%]	Ration calculated [kg]	Time	Runtime [s]
1	Becken 2	2000	RBF	20.000	Novofood	XY5302	75	0,0220	06:02	2
2								0,0230	07:02	3
3								0,0440	08:02	5
4								0,0550	09:02	6
5								0,0460	10:02	5
6								0,0230	11:02	3
7								0,0220	12:02	2
8	Becken 2	3000	RBF	30.150	Novofood	XY5302	75	0,0160	06:03	5
9								0,0090	07:03	8
10								0,0820	08:03	11
11								0,185	09:03	13
12								0,0920	10:03	11
13								0,0690	11:03	9
14								0,0460	12:02	5
15								0,230	15:58	27
16	Becken 4	4000	RBF	40.223	Novofood	XY5304	75	0,0660	06:04	9
17								0,120	07:04	14
18								0,100	08:04	10
19								0,300	09:04	24
20								0,160	10:04	10
21								0,230	11:04	14

Buttons: Close

Settings Feeding

Becken 13

Calculate amount of feed:

Quantity: 12000
 Fish weight [g]: 130,80
 Adjustment factor [%]: 75
 automatic calculation [kg]: 7,88
 manual amount of feed [kg]:
 Species: RBF
 Feed: Novofood
 Batch no.: XY53013

Limits:
 max. Temperature [°C]: 20
 min. Oxygen saturation [%]: 6

Automatic feeder:
 Internal period ON [s]: 10
 Internal period OFF [s]: 10
 Output [cm]: 500

Operation mode:
 Off
 Auto

No	Becken	Time	Rate [%]	Runtime [s]
1				
2				
3		06:13	10	87
4		07:13	15	131
5		08:13	20	175
6		09:13	25	219
7		10:13	20	175
8		11:13	15	131
9		12:13	10	87
10		08:06	6	0
11		09:06	6	0
12		10:06	6	0
13		11:06	6	0
14		12:06	6	0
15		08:06	6	0
16		09:06	6	0
17		10:06	6	0
18		11:06	6	0
19		08:06	6	0
20		09:06	6	0
21		11:13	1005	

Buttons: Accept, Close

Parameterlist Feeding

No	Name	Operation mode Auto	amount of fish	species	fish weight [g]	Feed	Batch no.	Adjustment factor [%]	autom. calculation	Ration calculated [kg]	Ration manual [kg]	max. Temp. [°C]	min. O2 [%]	Feed eject [g/min]	Intervall On [s]	Intervall Off [s]	Time 1	portion
1	Becken 1		1000	RBF	10,000	Novofood	XY5301	75	<input checked="" type="checkbox"/>	0,0300	6,00	20	0	0	10	10	06:02	10
2	Becken 2	<input checked="" type="checkbox"/>	2000	RBF	20,000	Novofood	XY5302	75	<input checked="" type="checkbox"/>	0,220	1,80	20	0	500	10	10	06:02	10
3	Becken 3	<input checked="" type="checkbox"/>	3000	RBF	30,150	Novofood	XY5303	75	<input checked="" type="checkbox"/>	0,460	0,0	20	0	500	10	10	06:03	10
4	Becken 4	<input checked="" type="checkbox"/>	4000	RBF	40,223	Novofood	XY5304	75	<input checked="" type="checkbox"/>	0,800	0,0	20	0	500	10	10	06:04	10
5	Becken 5	<input checked="" type="checkbox"/>	5000	RBF	50,370	Novofood	XY5305	75	<input checked="" type="checkbox"/>	1,24	0,0	20	0	500	10	10	06:05	10
6	Becken 6	<input checked="" type="checkbox"/>	6000	RBF	60,438	Novofood	XY5306	75	<input checked="" type="checkbox"/>	1,75	0,0	20	0	500	10	10	06:06	10
7	Becken 7	<input checked="" type="checkbox"/>	7000	RBF	70,494	Novofood	XY5307	75	<input checked="" type="checkbox"/>	2,34	0,0	20	0	500	10	10	06:07	10
8	Becken 8	<input checked="" type="checkbox"/>	8000	RBF	80,550	Novofood	XY5308	75	<input checked="" type="checkbox"/>	3,00	0,0	20	0	500	10	10	06:08	10
9	Becken 9	<input checked="" type="checkbox"/>	9000	RBF	90,609	Novofood	XY5309	75	<input checked="" type="checkbox"/>	3,73	0,0	20	0	500	10	10	06:09	10
10	Becken 10	<input checked="" type="checkbox"/>	10000	RBF	100,66	Novofood	XY53010	75	<input checked="" type="checkbox"/>	4,52	0,0	20	0	500	10	10	06:10	10
11	Becken 11	<input checked="" type="checkbox"/>	11000	RBF	110,70	Novofood	XY53011	75	<input checked="" type="checkbox"/>	5,40	0,0	20	0	500	10	10	06:11	10
12	Becken 12	<input checked="" type="checkbox"/>	12000	RBF	120,76	Novofood	XY53012	75	<input checked="" type="checkbox"/>	6,33	0,0	20	0	500	10	10	06:12	10
13	Becken 13	<input checked="" type="checkbox"/>	13000	RBF	130,80	Novofood	XY53013	75	<input checked="" type="checkbox"/>	7,33	0,0	20	0	500	10	10	06:13	10
14	Becken 14	<input checked="" type="checkbox"/>	14000	RBF	140,85	Novofood	XY53014	75	<input checked="" type="checkbox"/>	8,38	0,0	20	0	500	10	10	06:14	10
15	Becken 15	<input checked="" type="checkbox"/>	15000	RBF	150,88	Novofood	XY53015	75	<input checked="" type="checkbox"/>	9,49	0,0	20	0	500	10	10	06:15	10
16	Becken 16	<input checked="" type="checkbox"/>	16000	RBF	160,93	Novofood	XY53016	75	<input checked="" type="checkbox"/>	10,6	0,0	20	0	500	10	10	06:16	10
17	Becken 17	<input checked="" type="checkbox"/>	17000	RBF	170,96	Novofood	XY53017	75	<input checked="" type="checkbox"/>	11,8	0,0	20	0	500	10	10	06:17	10
18	Becken 18	<input checked="" type="checkbox"/>	18000	RBF	181,00	Novofood	XY53018	75	<input checked="" type="checkbox"/>	13,1	0,0	20	0	500	10	10	06:18	10
19	Becken 19	<input checked="" type="checkbox"/>	19000	RBF	191,03	Novofood	XY53019	75	<input checked="" type="checkbox"/>	14,4	0,0	20	0	500	10	10	06:19	10
20	Becken 20	<input checked="" type="checkbox"/>	20000	RBF	201,07	Novofood	XY53020	75	<input checked="" type="checkbox"/>	15,7	0,0	20	0	500	10	10	06:20	10

Buttons: Test-Data, Accept



FishFarmer – Management Software

LINN-FishFarmer is a Management Software System created specifically for aquaculture facilities and fish farms - primarily for the professional operator. We are not aware of such a complete and adaptable software solution being available on the European market!

The stored calculation methods are derived from salmonid production. Adaptation for other species is of course possible, all stored data/tables and empirical values can be individually changed and adapted by the user.

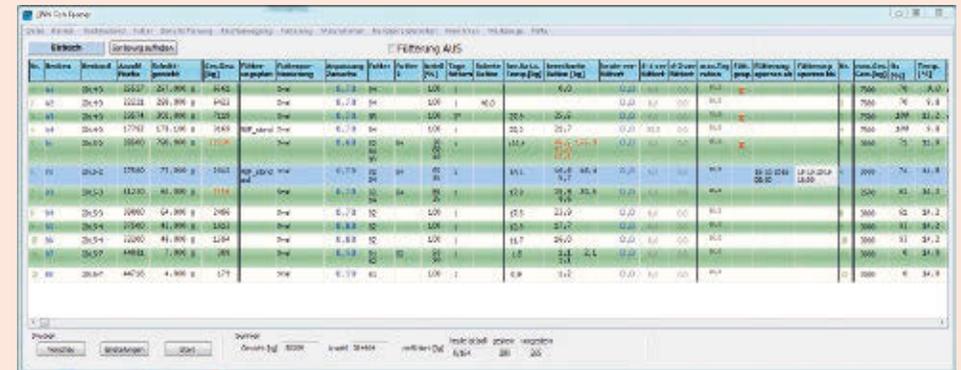
A critical factor is the detailed and comprehensive management of all fish stocks of an aquaculture unit or fish farm. A report is created for each tank, which records all processes such as feeding, growth, harvesting or medication. When harvesting a tank, this output report can be archived and is thus retained for later evaluation.

Feeding control is the second major component of the program. Each crop (pond or canal) is allocated the optimum amount of feed depending on temperature, growth target and oxygen saturation.

In conjunction with an automatic feeding system, an economic and powerful control solution is achieved - Utilising the Manual Feeding Option, the software provides all the information required to carry out manual feeding in the best possible way taking account of the above criteria.

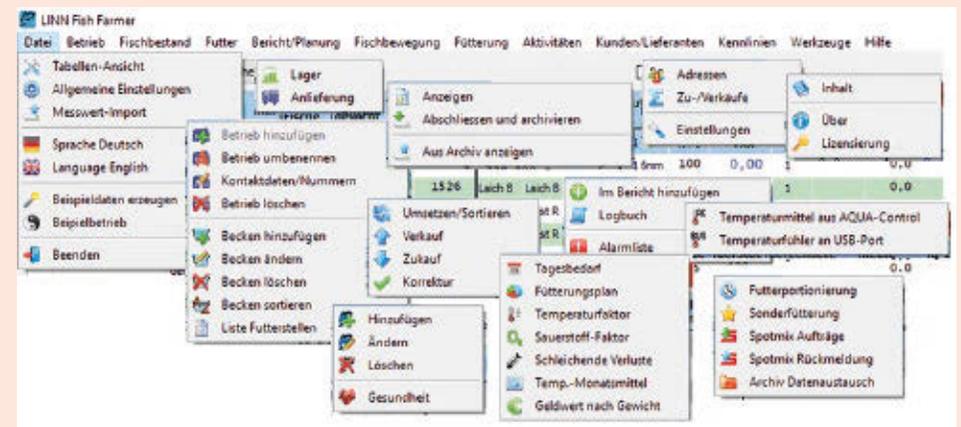
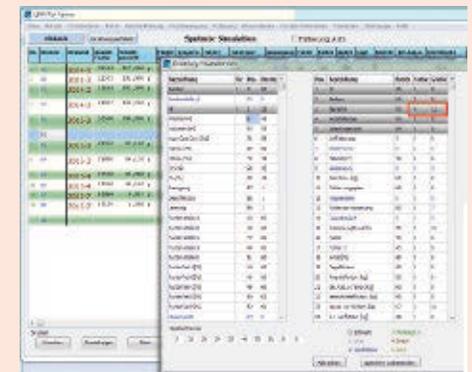
LINN-FishFarmer can be networked to our proven monitoring system Aqua-Control. It can also be networked to the automatic Schauer-Spotmix feeding.

The interface with AQUA-Control works in both directions. Thus, current temperature and oxygen values can always be read in, but the oxygen inputs can also be increased before planned feedings. The available option of Aqua-Control feeding control (for automatic feeding or manual feeding) is then replaced by the much more powerful functions of FishFarmer.

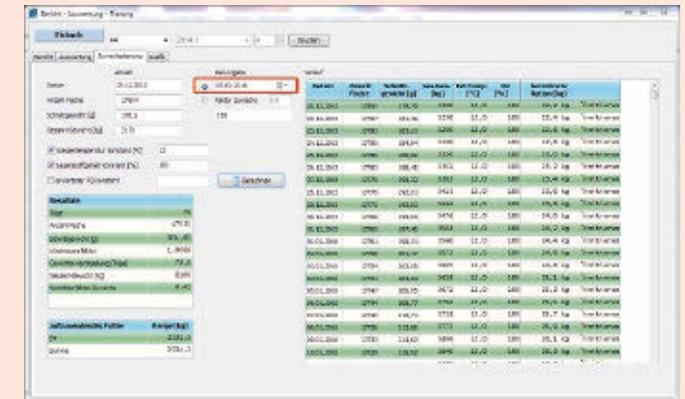
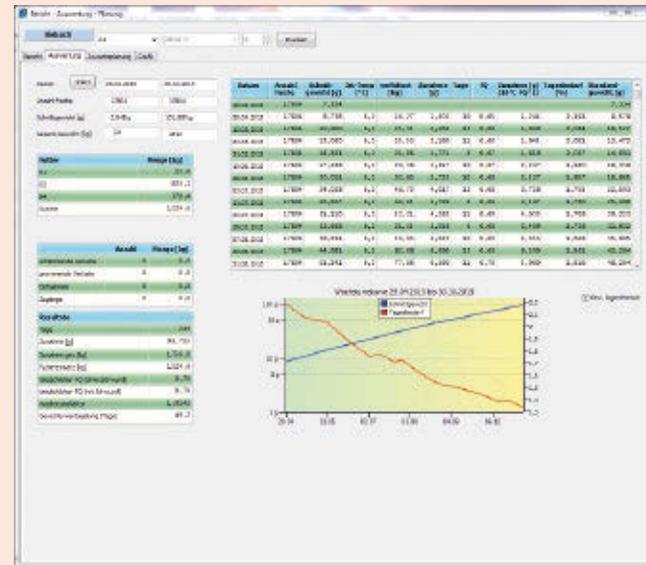
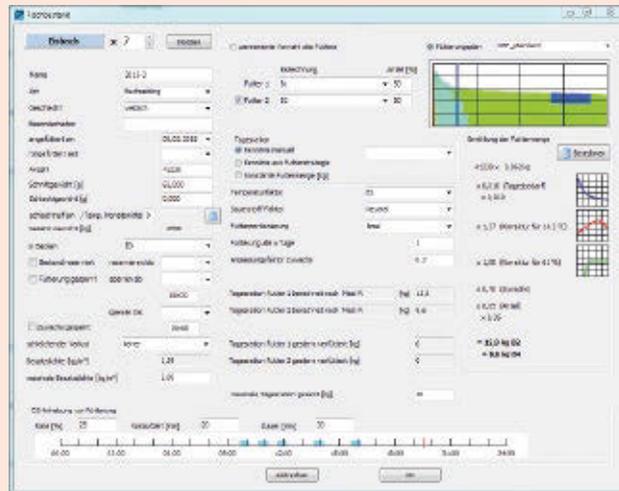


main view FishFarmer

The main view of the software consists of an individually adjustable table, similar to the popular Microsoft Excel software.



view of the menus



growth planning

Each fish stock is assigned numerous properties in a clearly arranged input overlay. In addition to purely basic information (such as species and sex), parameters for feeding can be set. We provide characteristic curves for temperature dependency (specific to the fish species), daily requirements, expected feed quotients and much more. The daily feed ration can be divided into up to 20 individual feeds, even repeated feed-free days are possible.

The harvest maturity (date for desired target weight) can be calculated on the basis of the current settings, the adjustment of the growth rate then allows fish production to schedule. Since the water temperature plays a decisive role, a characteris-

tic curve with monthly mean values can be used as a basis. All characteristic curves are already included in the software, but can be individually adapted to the conditions of your own system.

The fish stock can be afflicted with unforeseen losses, so the stock numbers automatically reduced once a day. Stocking densities are determined, exceeding limits generates corresponding warnings.

The growth of the fish requires an adjustment to take account of the feed pellet size. FishFarmer can do this for you easily. It is possible to store feeding plans, which assign a mix of 2 feed types to a fish weight. In the transition phases, for example, Feed 1 is reduced from 100 % to

67 % at 100 g fish weight and Feed 2 then comprises the remaining 33 %. A further reduction of Feed 1 to 33% would then be conceivable from 110g onwards, in order to finally feed only Feed 2 from 120g onwards. This allows the fish time to adapt to the new size.

All Automated data inputs and where necessary, manual inputs are brought together in a report. Using all data inputs FishFarmer can then make evaluations. The actual feed quotient calculated in this way can then provide an optimised feed supply for the next generation of fish. However, meaningful results are only possible if the actual fish weight in the tank is determined regularly, compared and entered as a correction in the pro-

gram. Another function is growth planning. Here the growth of the fish can be calculated with different defaults. The determined optimum growth factor is then set in the feeding overlay and provides precisely produced fish with the desired weight.

ADVANTAGES:

- Developed from many years of practical experience!
- Integrated online help to support the user
- German and English version can be interchanged
- A 30-day demo version is available as a free download



complete unit in protective housing



version with transmitters for oxygen probes

Aqua-Control Kompakt

We have developed a further extension to our **Aqua-Control** system for quick and easy use in fish farms.

The basic concept for this compact system is to supply a complete pre-wired unit that can be brought into operation in fish farms with little installation and wiring effort.

Aqua-Control Compact is a unit for controlling and monitoring up to four oxygen supply systems. It consists of the following components:

Control box with PLC module

The plastic switch box is completely pre-assembled and wired. A PLC display module is visible which constantly displays the actual values of the connected oxygen probes. The integrated keypad can be used to set the desired target values of the input systems and, in addition, an alarm threshold. Further-

more, the switch box contains a Residual Current Device (RCD), the necessary motor protection switches for the connected devices as well as the control relay for the sockets of the input systems and the solenoid valves of the oxygen supply line.

Motor protection and RCDs of the devices are constantly monitored (in addition to the oxygen value) and, in the event of irregularities, forwarded to an alarm switching device via a potential-free contact. The connection of further signal transmitters (such as float switches, level monitors or temperature probes) can be achieved easily.

Five sockets are located on the lower half of the switch box: four controlled sockets for plugging in the input systems and another for flexible use. Also included are four sockets for connecting the oxygen probes.



detail switch box



detail PLC module in switch box

Oxygen Flowmeter with Solenoid Valves

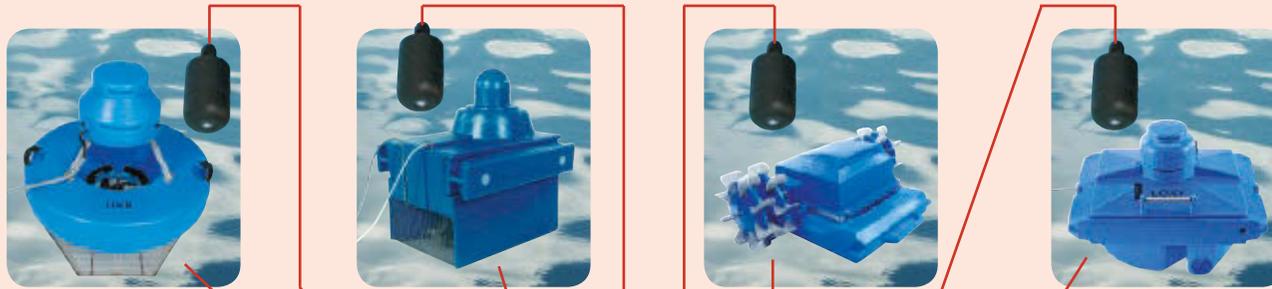
The **Aqua-Control Compact** unit as standard is equipped with five flow meters (further meters and scale on request). Four of the O₂ flow meters are automatically opened and closed by solenoid valves (normally closed) according to the inputs on the PLC. The fifth outlet can be used flexibly and is closed manually with a ball valve.

Protective housing

Both the control box and the oxygen flow meter are housed in a robust and weather-resistant polyethylene protective housing. The housing (dimensions 120 x 78 x 40 cm) was developed by us specifically for this system. **Aqua-Control Compact** can be easily mounted and screwed onto a base or foundation with this housing. Recesses for inserting the supply cables are incorporated in the housing.

Aqua Control compact is designed for rapid application. Only the power supply line, the oxygen supply line and a control line (if the system is to be connected to an alarm centre or a PC) are to be connected on site. All other wiring is already in place. All you need to do is plug in your input systems and the oxygen probes!

The most convenient solution is to combine **Aqua-Control Compact** with a computer. By means of a 2-wire USB line, the PC enables a central setting of all pre-sets and alarm values. The actual values can be displayed in your personal pond view. It is also possible to record the O₂ saturations over any length of time.



IMPORTANT: The adjustment capabilities on the switch box remains the same! A possible failure of the computer has no effect on the oxygen control!

This expansion stage also offers the possibility to "look into" the PC of a distant fish farm via telephone line from your PC at home. So at any time you can determine the current conditions or evaluate any alarm messages (over fixed net or mobile phone) and provide the necessary response.

Aqua Control compact combines the advantages of our proven system **Aqua control** developed over many years with the wishes of our customers for compact and pre-finished units which can self-installed. As you can see, the possibilities are endless – contact us now!

Variant II – Display of all data on the PC with alarm messages on the screen and additional alarming on mobile phone / smartphone

Variant I – Alarm triggering via horn/flashlight and/or telephone dialler

Stationary Oxygen Probe

A key component of any monitoring system is an oxygen sensor installed directly in the pond. This sensor/probe optimally protects against any malfunctions (electrical outages, motor malfunctions etc) that could lead to a reduction in oxygen levels.

Optical Sensor

This new kind of probe works with a light sensor. We provide this probe with special programming and a protective cap for use in fisheries.



ODOS - oxygen probe

We are generally able to combine our monitoring and control systems with a range of different probes.

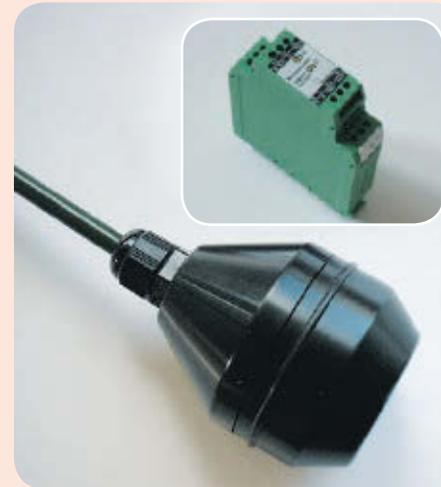
All probes work with a 4 - 20 mA current. Probes measure oxygen in % saturation (mg/l on request).

The only closure is the robust sensor cap, which can simply be removed and replaced after use (3-4 years). No additional transducer is necessary for this kind of probe. The optical ODOS probe can easily be added to existing systems as a replacement sensor, as it can also be connected using a two-lead cable.

The optical probe offers stable measurements, does not require inflow and does not have to be calibrated.



LINN Calibrator for optical oxygen probe



Dryden oxygen probe and transducer

DRYDEN Probe

This probe is also an electro-chemical sensor. In this type, the transducer is located outside the sensor itself. The electronics are not in the sensor casing and therefore not constantly under water.

The transducer can be kept in the control box as a rail module. Again, a two-lead cable is sufficient.

OXYGUARD Probe

This type of probe is an electro-chemical sensor (with membrane and electrolytes). This technique has proven itself in daily use in fisheries.

In the Oxyguard probe, the necessary electronics (transducer) are located within the sensor. This is advantageous, as an additional control box for the transducer is not necessary.

The sensor can be calibrated using a potentiometer directly on the sensor. A two-lead cable is sufficient to power the sensor.



Oxyguard oxygen probe