

Doppler DPS Pellet Sensor



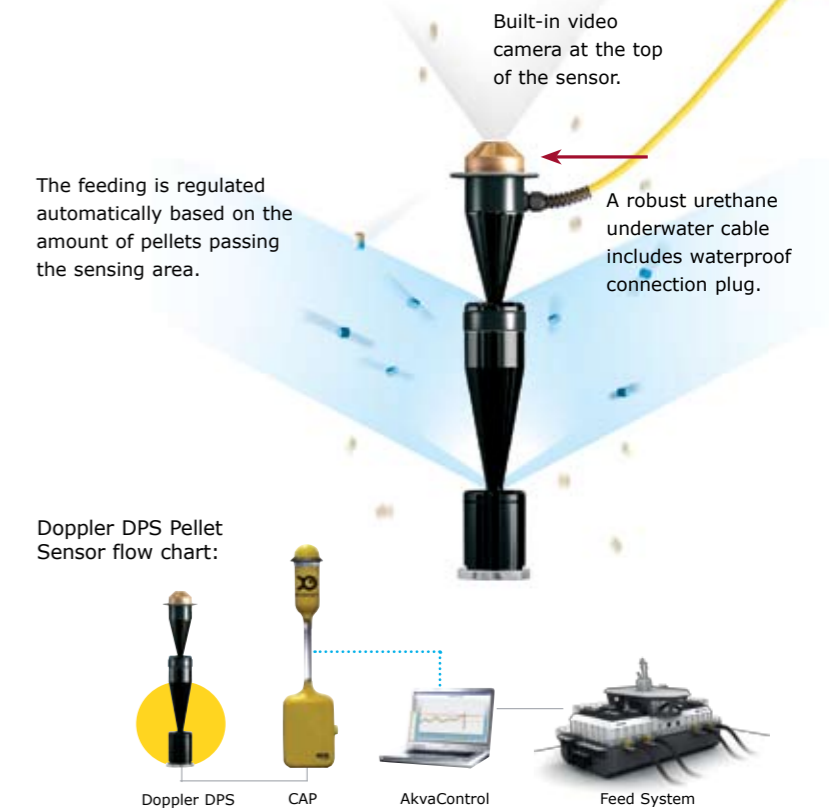
Intelligent pellet sensor with built-in camera...

Correct feeding is key to achieving good fish farming results. The Akvsmart Doppler Digital Pellet Sensor (DPS) allows for feeding the fish to satiation automatically. Both the feed rate and feed amount are adapted to fish appetite. This ensures that the fish get the correct amount of feed, at the right rate and at the right time. This sensor is installed below the fish' main eating area in the cages and uses our patented Doppler technology to detect uneaten pellets. It has a built-in video camera for visual control and calibration of the Doppler DPS.

The system is fully integrated with the Akvsmart CCS Feed System. The Doppler DPS connects to the wireless sensor network via the CAP (Cage Access Point).



The sensor is integrated with the CCS Feed System via a new CAP wireless network. This provides unparalleled control of the feeding.

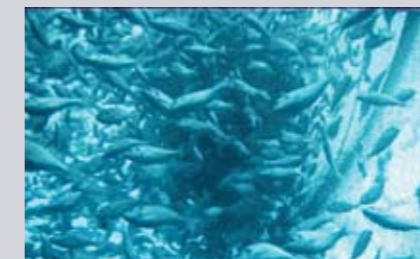


Doppler DPS Pellet Sensor	
Sensing area - H x Ø:	2,5m x Ø 2,5m (8' x 8' diam.) vertical cone shaped area
Normal installation position:	Below the main eating area in the cages (typ. at 5-10m / 16-32' depth)
Operating temperature range:	-2°C to +40°C (+28°F to +104°F)
Sensing method:	Acoustics (Doppler effect)
Cable:	30m (100') polyurethane (optional: 40m (130'))
Connection plug:	Amphenol 7-pin waterproof and potted
Max depth:	40m (130') limited by cable
Size - L x Ø:	570mm / Ø 90mm (22.5" / 3.5" diam.)
Weight:	7,4kg (16,3 lbs.) incl. cable and zinc anode

The Doppler DPS Pellet Sensor ensures correct feeding and no food waste



The sensor regulates the feeding based on amount of uneaten pellets passing the sensing area of the Doppler DPS.



The Doppler DPS is suspended underneath the main eating area of the fish and detects uneaten pellets sinking towards the sensor.



The built-in video camera looks straight up towards the surface during the feeding in order to see uneaten pellets.

Environmental Sensors



Temperature Sensor



Optical Oxygen Sensor



Current Sensor

Environmental data is a critical feeding parameter...

To know the environmental data as temperature, oxygen and current speed are factors that are important inputs when feeding fish. In the Akvasmart CCS Feed System all these factors can be set to automatically control or adjust the feeding. All environmental data will be logged and can be used in further analyses either in AkvaControl or in Fishtalk.

Temperature - the foundation for all feeding regimes and growth models.

The Akvasmart Temperature Sensor is a reliable and robust sensor that can be submerged at desired depths. Accurate real time readings are displayed and logged by the AkvaControl Feed System software. AkvaControl can calculate the expected daily feed amount based on feed tables with measured temperature data. The Akvasmart Temperature Sensor is connected to the Akvasmart CCS Feed System either by connection to the Akvasmart CCS Selector Valve or via the CAP network.

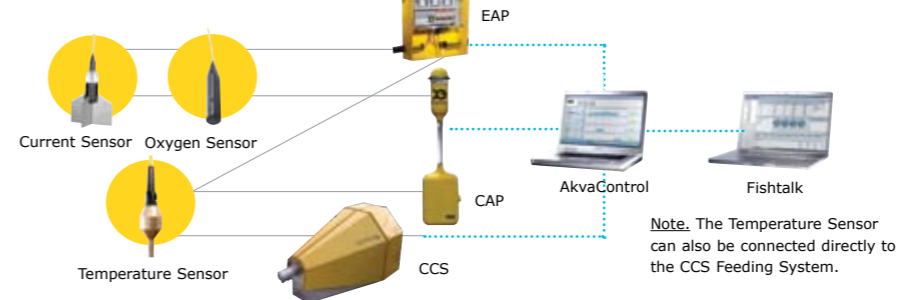
Oxygen - an important factor for growth and fish welfare.

The Akvasmart Oxygen Sensor is connected to the Akvasmart CCS Feed System and can stop the feeding at low oxygen levels in water. The Oxygen Sensor is an optical sensor that is robust and dependable with no need for water flow. The only maintenance is periodic cleaning and there is no need for re-calibration. The principle of operation is to illuminate the oxygen as the reflected light is a measurement of dissolved oxygen in the water.

Environmental current - knowledge's prevents feed waste

The Akvasmart Current Sensor is connected to the Akvasmart CCS Feed System and will prevent feed waste caused by tidal current that pushing pellets out of the cage. The Akvasmart Current Sensor is located in strategic positions at site and you set which cages that are connected to the sensor and the maximum tidal current speed (in cm/sec) that allows feeding. When the current speed exceeds the limit, the feeding temporarily stops in these cages and resumes at slack current later, all other cages will be feed as scheduled.

Environmental Sensors flow chart:



The machined bronze housing prevents marine fouling and makes the sensor low maintenance.

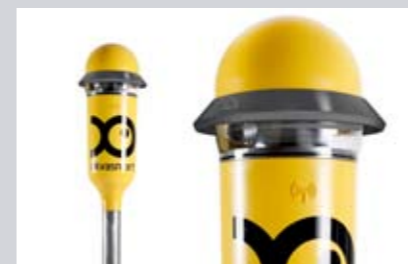


The absolute oxygen concentration is measured by illuminating a membrane with modulated blue light and by reading the phase changes in the reflected red light. The signal is then linearised and temperature compensated.

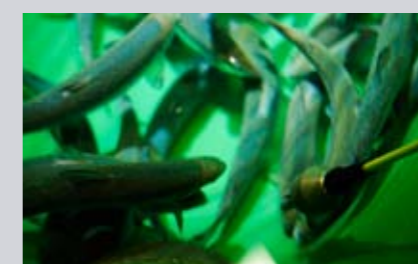


The Current Sensor angles like a pendulum when exposed to currents. The angle is measured and converted electronically to cm/sec.

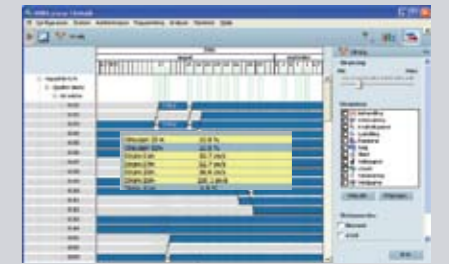
Accurate environment control is a important insurance



Continuous data readings from the cages are transmitted through the Akvasmart wireless sensor network (CAP) or via an EAP (Environmental Access Point).



Using the Temperature Sensor in combination with an Oxygen Sensor gives a good picture of the environment.



The integration between Akva Control and Fishtalk software provides the choice of where and when to analyse the environmental data.