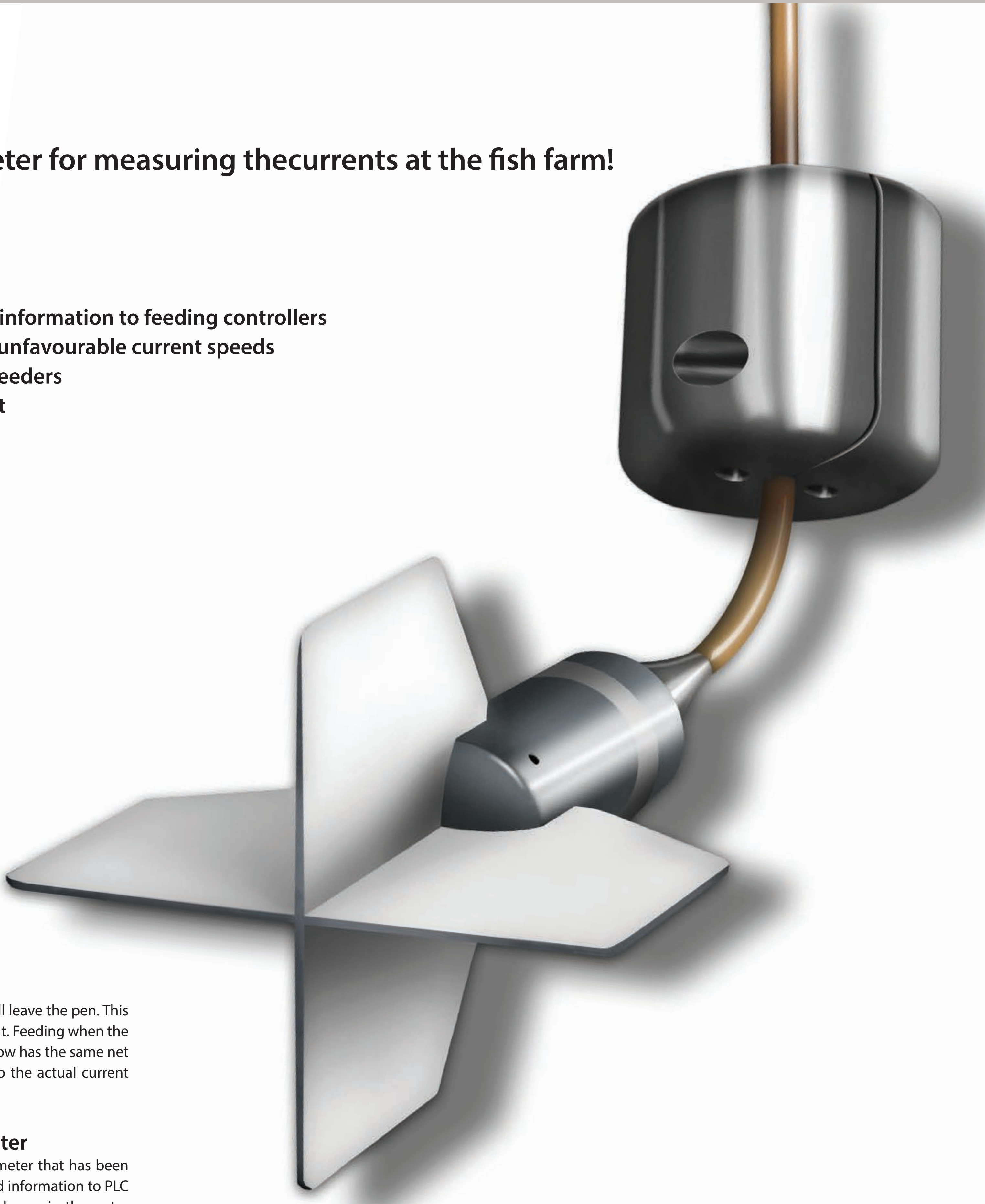
FeedFlow®

ALVESTAD

New pendulum currentmeter for measuring thecurrents at the fish farm!



- -Supplies continuous current speed information to feeding controllers
- -Stops feed waste due to feeding at unfavourable current speeds
- -Ready interfaced for all automatic feeders
- -PLC standard 4-20 mA signal output
- -Non moving sensor elements
- -PLC standard 12 -24 V power
- -Resistant to biofouling
- -Robust and reliable

Specifications

Model 10A Range 0-35 cm/s
Accuracy +/- 1 cm/s
Model 10B Range 0- 50cm/s
Accuracy 1 cm/s
Model 10C Range 0-1 m/s
Accuracy 2 cm/s
Output signal: 4-20 mA linearized current loop
Supply voltage: 12- 25 V DC
Current consumption: Current loop: 20 mA
Instrument: 10 mA

Optional units

4- 20 mA Current direction sensor

Feed waste steals from your profit!

Means that a large number of uneaten feed pellets will leave the pen. This increases feeding costs and detoriates the environment. Feeding when the current speed is close to zero and the fish appetite is low has the same net effect. A feeding pattern that automatically adapts to the actual current speed will efficiently reduce the feed waste.

Rebirth of the Pendulum current meter

Feedflow is a robust and reliable pendulum current meter that has been specially designed to supply continuous current speed information to PLC controllers in automatic fish feeders. The instrument hangs in the water from a flexible cable end and measures the water velocity by converting the resultant tilt angle to an equivalent current speed.

How Feedflow works

Feedflow measures the current speed by determining the combined strength of the moving water`s horizontally acting drag forces and the vertically acting gravitational for-ce. (Fig. 3) In practical use instrument hangs near the actual fish pen from a flexible cable that extends from a vertically mounted tube. At zero current speed the drag forces will be zero, and the instrument will hang vertically in the water. When the current speed increases, the horizontal drag forces increase in strength pulling the instrument an angle ø off the vertical line. The stronger current speed, the larger tilt angle. (Theoretical maximum: +/- 90 degrees). A built in tilt meter determines ø, and the instrument microprocessor calculates the current speed from the measured tilt angle ø and from a calibra-tion equation. Finally the current speed is presented to the receiving PLC controller at the far end of the cable as a linearized 4- 20 mA current loop signal.

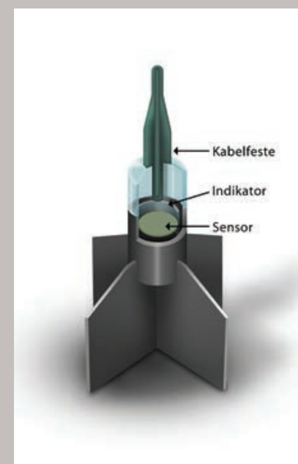
Mechanical design

Fig 2 shows the basic mechanical design. The instrument is arrow shaped using 4 fins for steering and drag amplifica-tion. It hangs in a flexible cable end from a vertically moun-ted metal tube. When exposed to drag forces from moving water, the current meter will be pulled a resultant angle ø off the vertical line de-pendent on the ratio between the horizontal drag forces and the vertically acting gravity force. Sensitivity and current speed range depend on the instru-ment size and weight.

Electronic design

The measuring and processing components can be seen on the horizontally mounted card inside the instrument. Digital tilt signals from the tilt sensor are continuously received by the microprocessor and converted to a 4- 20 mA linearized current loop signal. (4 mA represents zero current speed and 20 mA represents the maximum current speed.) The conversion is updated each second, but in order to remove any disturbing effect of waves, the output signal is time averaged. Power to the electronic unit (Typically 24 V DC) can be taken from the PLC controller`s own power supply.

Fig 1:
The work of Feedflow



Figur 2:
Basic mechanical design