

New Clump Sensor for Twin and Triple Trawls



The Clump sensor provides 100 % accurate distance measurements between trawl doors and clump(s) for optimal trawl geometry.

Page 15

Trawl Speed and Trawl Symmetry;

Important factors for catch ability and fuel consumption

It is not unusual that a lot of the expected catch is lost due to incorrect towing speed in relation to the water flow.

Page 12 and 13

Test of new Double Distance Sensors on Vesttind



Technical personnel from Scanmar went to sea with Vesttind to test the new SS4 Door and SS4 Clump sensor for twin trawls.

Page 6

Gadus Poseidon

The Trawler of the Future



Foto: Harald M. Valderhaug

Gadus Poseidon is the first of Havfisk's three new, innovative trawlers that will improve the fleet's environmental performance and increase catch efficiency. The trawler has invested in the latest technology in propulsion, fishfinding and trawling, and is equipped with a complete Scanmar ScanScreen catch system.

Page 10

Scanmar Agreement; Predictability and Economic Benefits

Scanmar now offers our loyal customers a series of benefits through a Purchase and a Service Agreement.

The benefits include skipper exclusive prices, seminars & technical training, telephone support, a dedicated contact person, access to trial licences for new functions, and much more.

Page 5



ScanFacts

By Ulf Lundvall
Managing Director

The modern fisheries and their operators have never been more focused on cost effective methods, equipment and vessel design than today. This has become a necessity for those who seek to run a profitable and substantial harvest of our common resources, and to meet new regulations from the authorities.

Scanmar has for more than three decades invested in new technology to prove the facts of trawling; facts that are well known to us and many fishermen, though still unrealized by the few. These facts are based on commonly known physics.

ScanFacts

- Vessel performance is affected by wind, surface current, tide and sea state
- Trawl door performance is affected by vessel performance, speed through water, bottom contact, warp length/depth ratio, rigging i.e. roll/pitch and angle of attack
- Trawl performance is affected by trawl door performance, speed through water, symmetry, geometry, bottom contact and positioning in relation to the species targeted
- Fuel mileage vs. catch ability is affected by trawl performance, ground coverage and catch monitoring
- Hydro acoustic measurements e.g. echo sounder and door spread is affected by water temperature, depth and salinity

Vessel performance

A fishing vessel is designed and equipped for catching and processing the species targeted. In addition one has to take into account mandatory regulations and fuel efficiency. A modern trawler design nowadays more often includes hybrid propulsion packages. This may also reduce the noise level of the vessel, and Scanmar is developing a noise detection system. The noise pattern of a vessel may have a scare effect on the species targeted, and by monitoring this you can learn to avoid such frequencies.

Trawl door performance

Every trawl door manufacturer takes his pride in having a design efficient for the type of fishery it is intended for. However, to utilize the design to its best, it is of great importance to monitor the rigging of the door: tension, speed, depth, roll and pitch. In a perfect situation the trawl door should be in a vertical position i.e. roll=0 degrees. The optimal pitch angle depends on the bottom conditions (bottom trawling), but for pelagic trawling it is designed for a neutral pitch.

The depth value monitored by Scanmar's Door sensor is always correct. The measured roll and pitch angles are correct if the installation of the door pocket is aligned accordingly to our instruction only. In addition each sensor has to be calibrated in the wheel house unit.

Any other way of installation may cause incorrect readings.

Further, with regards to door spread readings, Scanmar has introduced the new patented feature; the automatic temperature compensation function, which ensures correct distance measurements.

Trawl performance

In an ideal situation, the trawl has its correct shape. Unfortunately this is seldom the case during active trawling, and the skipper has to adjust and compensate for various conditions; underwater currents, bottom conditions etc. Another challenge is to detect twisting of the trawl e.g. when towing in a slope. If the trawl gets twisted, it will stop fishing. We have therefore included the twist detection in our Catch sensors.

Fuel mileages vs. catch ability

At the end of the day, for all kinds of commercial fisheries, it is all about running a sustainable, profitable and safe business. Taken the above mentioned ScanFacts into account, these are all key factors necessary to understand to be able to excel. Those who ignore these obvious facts also choose to show ignorance with regards to the goals of a sustainable fishing industry.

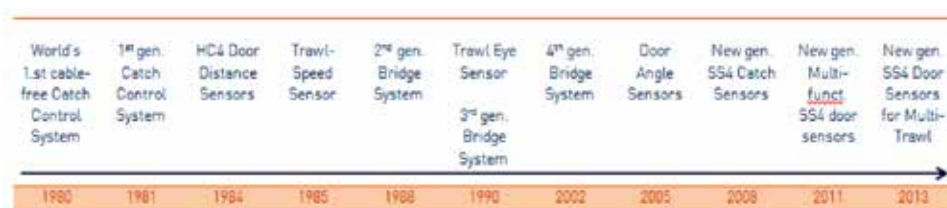
Hydro acoustic measurements – Temperature compensation

It is a common fact that the speed of sound in water is affected by salinity, depth & temperature. Manufacturers of hydro acoustic equipment rely on a speed of 1500 m/sec. as a default setting for distance measurements.

Every research institute of fisheries is very much aware of the necessity to calibrate their hydro acoustic equipment (e.g. echo sounders etc.) before and during all surveys. Most fishermen also have knowledge of the subject, but very few take this fact into account when fishing. Scanmar has developed a new feature for temperature compensation, which is included in the new range of SS4 Door sensors. You can also choose to validate the licensed export function that enables automatic calibration of other equipment such as echo sounders, sonars etc. Scanmar has a patent valid for the temperature compensation feature.

Know-how – Know-why

Scanmar's technological development is a result of our ability to listen to the fishermen and thoroughly put efforts into studying how to utilize catch systems to assure profits for the fishing fleet. To be able to meet these requirements, it was essential to build the know-how of both catch techniques and the technology for monitoring. We needed to develop a reliable hydro acoustic transmission technology and a robust sensor design. Furthermore, to earn the fisherman's trust in our product, it was also a necessity to learn to achieve the more important understanding – The know-why.



Content

ScanFacts	page 2	Is Your Bridge System Upgraded	page 11
New sensor with Height and Depth Functionality	page 3	It's not Enough to Assume. You Must Know	page 12
Profitable Investment	page 3	Towing speed, Towing Resistance and Catch	page 13
Scanmar Seminars and Training Courses	page 4-5	Optimal Symmetry = Efficient Trawl	page 14
Scanmar Agreement	page 5	Early Filling Indication with SS4 Catch Sensor	page 15
Sea trial on Vesttind	page 6-7	Accurate Distance Measurements	page 15
Product Overview	page 8-9	French Fish Soup - Bouillabaisse	page 16
Scanmar - the natural choice for Gadus Poseidon ...	page 10	ScanCross	page 16

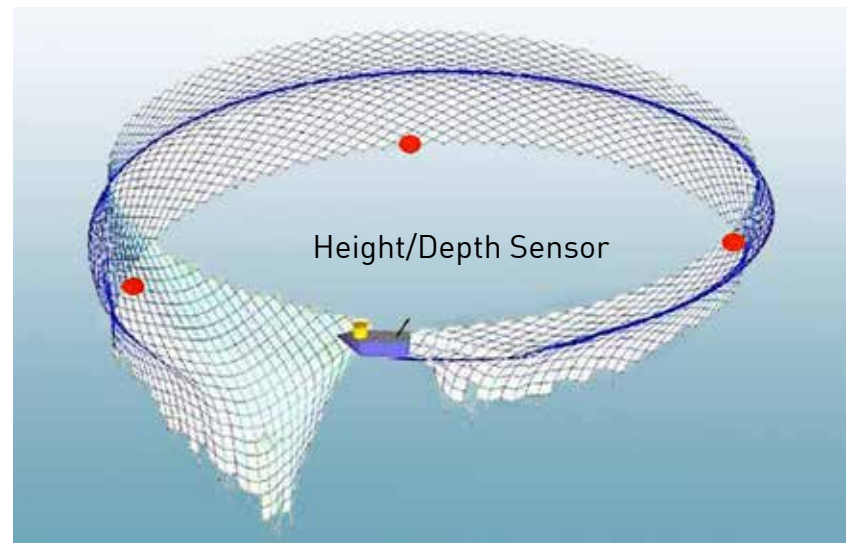
Ref. 1/2013

New Sensor with Height and Depth Functionality for Seiners

We have for decades supplied sensors to Seiner vessels all around the world. The benefit of observing the net's behavior in the critical shooting phase is undisputed. Depth sensors that measure the water pressure have traditionally been used to monitor the sinking rate and the position of the net in the water. Together with the information from the echo sounder the skipper can start pulling the net when it has reached the depth of the targeted school. However, skippers on vessels that targets species closer to the seabed and /or in shallower waters have requested the measurement of the height above the seabed.

Scanmar has previously developed and delivered a series of combination sensors that provide depth and height functionality. Among the users of these sensors are the Norwegian vessels Meløyfjord, Sørøyfisk, Trønderkari and Nordsild. After a period of testing Scanmar is now launching a Height/Depth sensor specially designed for the Seiner fleet. The main objective throughout the developing process has been to create a stronger sensor to minimize the risk of damage during shooting or from Triplex and power block. It is constructed with the same hardy and solid plastic materials that are used in the SS4 generation sensors. In addition, the sensor body is reinforced with Kevlar arming. A test of the maximum tension load on the fastening lugs proves that the new construction is many times stronger than before. This makes it significantly stronger than other height/depth sensors on the market.

All sensor data is graphically presented on the bridge system, so that the skipper can observe the net's movement and position at any time.



- Special sensor for Purse Seines with Depth/Height measurements
- Very robust construction protecting from damages (ex. from Triplex)

By observing the height from the seabed he is able to place the net closer to schools near the seabed with greater precision. The catch ability is increased and the risk of tearing the net is minimized.

Please contact your local Scanmar dealer for more information.

Profitable Investment

The objective of any investment is to boost earnings so that the investment is quickly recouped and provides lasting value even after it has paid for itself.

Scanmar's business concept is to offer products for the fishing fleet. The products should, individually and combined, assist in increasing profit for the individual vessel in the short and long term.

Investments are initially cash-intensive and are often large scale. Scanmar has therefore a product concept in which the systems can be extended and upgraded with new sensors and cabinets, so that the investment can be made over an extended period.

Scanmar started out with simple sensors such as Catch, Height, Depth and Temperature. It was soon evident that these were sensors which immediately gave the fishermen information that simplified the rigging and made operations more efficient.

With the increases in knowledge and the accumulation of know-how, we learnt along with many skippers that the big savings lay in exploiting the new information about the trawl doors' motion under varying bottom, current and environmental conditions, as well as the net's efficiency. Among the most advanced fishermen there is no disagreement that Scanmar's TrawlEye, TrawlSpeed/Symmetry sensor and the SS4 Door sensor are able to assist considerably in efforts to increase efficiency, as well as to reduce fuel consumption, repairs and maintenance. And not least, we receive a lot of feedback saying that what they register from the use of advanced sensors is that things are totally different from what they assumed.

Let's look a little more closely at what gains can be achieved:

Trawl geometry

The term "trawl geometry" involves the trawl being correctly tautened up in the horizontal and vertical planes and the gear having bottom contact. In addition to this it must be symmetrical in relation to the water flow entering the trawl. Without the correct trawl geometry, fish will escape underneath the trawl (bottom trawl), or disappear through the mesh if the trawl is skewed either horizontally or vertically.

Trawl speed

The correct tow speed relative to the fish's swimming ability and the net's ability to filter the water is necessary to avoid the fish failing to enter the trawl and to avoid a bucket effect arising in the trawl, which causes the mesh to stretch and the fish to escape.

Many fishermen tow by the speed over ground and forget that the speed under water may be different due to underwater currents. This means that the above problems arise when fishing in areas with currents or on slopes.

TrawlEye

The importance of seeing what and how much is entering the trawl doesn't need to be emphasized. Many fishermen display the TrawlEye over the full screen to get the best possible control.

The doors' angles and bottom Contact

The doors' roll and pitch angles are crucial to the trawl fishing efficiently. Incorrect angles lead to skew in the trawl and the doors losing bottom contact, which in turn causes the gear to lift off the bottom.

There are an additional number of other factors which, to one degree or another, affect the net's efficiency and the cost factors. These are generally well understood and we won't go into them here.

Scanmar Seminars and Training Courses; Increasing the Know-why



Scanmar is genuinely interested in how our equipment is utilized. The motivation is to ensure that our users have the necessary knowledge of how to get the most out of the system benefits to achieve an effective and successful fishing operation. Interaction is important, but even more so, the knowledge and in-depth understanding of the products that is achieved through close interaction is essential to any user who would like to benefit the most from the catch system.

To ensure a better cooperation, understanding and practical knowledge of the equipment, we invite you to come to Scanmar for a training course/seminar.

A Scanmar seminar typically starts with a tour on the premises, during

which our participants are able to see the full operation; how our sensors are developed, produced, molded and tested. We focus on an in-depth presentation of the relevant functions and benefits for the particular type of fishing. We generally also take the participants for a trip with our test vessel "Scanmar 1" to test the system in a realistic environment. On board, the users are presented the full system in action.

Feedback is important to us, as our Research & Development department is continuously searching to improve our existing assortment and develop new, user-friendly, robust and beneficial products. It is the user reports from the fishermen, as well as their needs and expectations in relation to the Scanmar equipment now and in the future, that give us ideas for our new developments.



On board presentations of functions and benefits.

An important part of the seminar is also the technical system walk-through from a more hands-on perspective, and our skilled service personnel focus on the following:

- Operation of Scanmar bridge units
- Changing FID configuration
- Software update
- Data logging parameters
- Basic testing of Scanmar sensors

At a Scanmar seminar, the user advantages and the unique features of the Scanmar catch systems are discussed in great detail. How can we make your system even more functional and effective? Examples could be adding an angle function to the Catch sensor or including a Flow/Symmetry sensor. And what makes Scanmar's systems stand out in terms of quality and reliability? Temperature compensation, SuperCatch and distance measurements on twin rigged trawls (door-to-clump) are just a few examples.

Are you interested in participating in a technical training course or user seminar? Contact us, and we will tailor a course to suit your needs and wishes. We can also arrange a course at another location, if this is more convenient for you.



Sensors are tested and demonstrated on "Scanmar I".

Scanmar Agreement; Predictability and Economic Benefits

Scanmar is the leading supplier and producer of catch control systems to the global fishing industry and research vessels. It is our experience that close cooperation with our customers creates opportunities for both parties, and this has always been our main focus.

To retain and build customer relationships we now offer our loyal customers an opportunity to get the best benefits from our equipment, most competitive prices and the best terms and service possible.

Some of the advantages of the Scanmar Agreement; Skipper Seminars & Technical training - to demonstrate the benefits of a full Scanmar system, telephone support, a dedicated contact person, access to trial licences for new functions and improvements, 10 years depreciation, your own service stock, all repairs and spare parts, access to Scanmar web portal and a monthly transaction report.

The agreement will also provide predictability for our customers in their purchases as they get exclusive prices. The agreement can be tailor made to suit each customer, and the customer can choose a Plus Purchase agreement, a Service agreement or both. It is our goal to assure that the agreement is so beneficial to each customer that they do not only choose Scanmar for the superior quality and user benefits, but also for the best service in the market.

Several customers have already seen advantages of being an Agreement customer, and have already benefitted from it.

For more information about the Scanmar Agreements, or inquiries about how to make fishing more profitable for your vessel(s), please contact our Sales department at sales@scanmar.no.

Agreement types and benefits
Scanmar Plus Purchase Agreement
Purchase of new sensor - exclusive prices
Trade-in discount - exclusive prices & service policy
Access to trial licences free of charge at time of purchase
Prior notice of campaigns & special offers
Scanmar seminars
Free technical training at Scanmar
Free technical on site training (on vessel or other location)
Priority participation in development and testing of new products
Dedicated contact person - exclusive Account Manager
Telephone support
Scanmar Plus Service Agreement
Service stock
Access to Scanmar Partner Web Portal
Monthly transaction report
Spare parts
Repair of damaged lug on SS4 sensors and replacement of TrawlEye plug
Calibration of Symmetry / TrawlSpeed sensor
Access to trial licenses free of charge at time of purchase
Depreciation 10 years
Telephone support

Sea trial on Vesttind



Vesttind, Norway

Owner:	Havfisk AS
Type of vessel:	Stern Trawler
Built:	2000
Horsepower:	7 500 hp
LOA:	60 m
Beam:	14 m
Cargo capacity:	900 m ³
Gross tonnage:	2243 tons

Good cooperation with fishermen is an important part of our focus. Exchange of user experiences makes room for new ideas and skills. The company Havfisk AS has been a good partner for a long time, and in June technical personnel from Scanmar went to sea with the trawler Vesttind to test the new SS4 Door and Clump sensor for twin trawls. The 60 meter long stern trawler was built in 2000 and ran a shrimp operation under the name Polaris until 2007 when Havfisk bought it. Today Vesttind has quotas for cod, saithe and haddock, in addition to a shrimp license in the Barents Sea.

The vessel is rigged for twin trawling with Injector doors, Thyborøn 6000 kg clump, Alfredo 5 trawls, pelagic trawl and a complete Scanmar Catch System. The trawl doors are equipped with multifunctional SS4 Door sensors with double Distance, Angle, Depth and Temperature function. And on the clump; a SS4 Clump sensor with extended Distance, Depth, and Angle function. There is a TrawlEye and a TrawlSpeed sensor mounted on the headline of each trawl, while the cod end is equipped with several multifunctional SS4 Catch sensors.

Thanks to long experience and good equipment, the skipper and first mate have total control over the doors' movements during fishing. Access to reliable and accurate information about the trawl's movements and performance is essential in an efficient fishery.

- Towing without sensors is like fishing blindly, says skipper Helge Larsen. The Scanmar system is one of the most important decision making tools on board. First mate Ronny Brynjulfsen comments:
- The total image of information we get from the Scanmar system, combined with our experience, makes it possible to make the right decisions. With Scanmar's ScanScreen system on the bridge, the crew on Vesttind has a good overview of all the data they wish to monitor at any time. They have both TrawlEye images on one screen, and the geometry image on the other screen.

Testing the new SS4 multifunctional Clump and Door sensor

- Earlier we towed mostly on experience and tried to form an image of the situation by monitoring the total distance between the doors, the winch tension and the TrawlEye image, Brynjulfsen explains. With an accurate measurement of all distances you have a more detailed image of what's going on behind the vessel and are quickly able to identify what is happening with each trawl. If the trawl gets stuck on

one side, you quickly notice that the respective door-to-clump-distance increases, followed by a change in the TrawlEye image and often also an increased tension in the winch.

The skipper and mate soon noticed that there have been major improvements in the reception from the sensor and the communication between the doors, compared to the previous generation of Door sensors.

- We now see that we have a much better contact with the doors, and that the measurements are more stable than before, Larsen says. Scanmar has invested significant resources in developing the distance module in the SS4-generation Door sensors to provide the users with an accurate tool they can depend on in all situations. The distance measurement is calculated by hydro acoustic principles and in relation to the speed of sound in water.

The speed of sound is affected by temperature, pressure and salinity. And the surface temperature is rarely equal to the temperature where the sensor measurement is being executed, so the distance



The new SS4 Clump sensor with extended distance function.



measurement is automatically corrected by the sensor in relation to the water temperature and depth where the sensor is mounted.

Always ready to use

The sensors' operational reliability and large battery capacity is highly appreciated on board.

- We want to focus on the fishing while we're at sea, and not on changing sensors, Brynjulfson says. It's concluded that the operation time between each charge is considerably longer compared to the previous generation Door sensor. With all the sensor functions activated, the SS4 Door sensor has an operation time of more than 300 hours which equals more than 14 days of fishing. By configuring the sensor further, the operation time is increased considerably.

The charging time of less than two hours makes it possible to charge the sensor while the fishing gear is on deck, e.g. between fishing grounds.

Vesttind has also used the SS4 Catch sensor for a while and the crew speaks highly of the «everlasting sensor».

- We mount the sensors at the start of the trip and take it off for charging five weeks later at the end of the trip, Larsen says and reflects on how it used to be before they had the SS4 sensors on board.

- For the sensor to activate at the right catch volume, the mounting is very important. It takes a while before you get to know how the sensor works, and there is a bit of trial and error during mounting before you have the correct adjustment. Previously, when the sensor was discharged, the recharged sensor wasn't always mounted just as optimal. With longer operation time we don't have the problem of having to take the sensor on and off the trawl.

Better control over the doors

- For the first time we have complete control of the doors' movement, Larsen says and talks about the DoorAngle function on the SS4 sensor.

- We used to tow with a wire length of 2 x depth + approx. 100 meters during fishing. We now see that the trawl doors have a tendency to lean inwards with the wire length we normally use. After reducing the wire length by approx. 50-60 meters they move much better and we keep the wanted square. It's surprising how sensitive the doors are when we are towing, and the ScanFactor tells us if the doors are stable or not.

- The Depth function on the sensor gives us a much better overview of the trawl and the doors' position during shooting and towing. With

the echo sounder connected to the Scanmar system we get a graphic presentation of the doors' position in relation to the seabed. During the shooting phase we use this together with the information from the TrawlEye, and are able to place the trawl safely on the seabed with the doors in the correct position.

Scanmar thanks both company and crew for all assistance and support during the sensor test on board Vesttind. Experiences made in the field are an important contribution for further development of the future's catch systems.

We thank especially skipper Helge Larsen and first mate Ronny Brynjulfson for very useful feedback. Incidentally, Larsen will be the new skipper on the company's newly-built vessel Gadus Njord, and Brynjulfson will take over as skipper on Vesttind.



- For the first time we have complete control of the doors, skipper Larsen says, talking about the DoorAngle function on the SS4 sensor.

SS4 Door Sensor



- Multifunctional sensor: Distance, Angle, Temperature, Depth, Tension
- Very accurate measurements and automatic correction of speed of sound in relation to depth and sea temperature
- Up to 700 h operation and very quick charging
- Solid construction and special plastic protect against damage

SS4 Clump Sensor



- Multifunctional sensor which, together with the Door sensor gives you the exact distance between clump and both doors, depth, temperature and tension
- Solid construction and special plastic protect against damage
- Up to 700 h operation and very quick charging

TrawlEye



- Detects species that are not visible on the vessel's echo sounder or sonar
- Provides clear images and precise information about the height of the trawl opening, bottom contact and bottom clearance
- Two options: Narrow beam and Wide beam

TrawlSounder



- Shows fish influx
- Provides information about the height of the trawl opening, bottom contact and bottom clearance
- It also shows the volume of fish passing, and together with a TrawlEye in the opening you can easily see whether the fish end up in the cod end

ScanScreen



- Multiple monitors
- Complete overview at a glance
- Graphical presentations
- Advanced and reliable technology

ScanBas



- Compatible with all Scanmar sensors
- Advanced and reliable receiver technology
- User-friendly graphical interface
- Upgradeable to ScanScreen

SS4 Catch Sensor



- Multifunctional sensor: Catch, Filling indication, Temperature, Rip, Upside down
- With the SuperCatch function (fast update) you can easily prepare hauling and avoid overfilling
- Up to 1 500 hrs operation time and quick charging
- Solid construction og special plastic protect against damage

SS4 Depth Sensor



- Multifunctional sensor: measures depth and sinking speed of trawl and seine, temperature and angle
- Constructed for up to 2 300 m depth
- Solid construction and special plastic protect against damage
- Up to 700 hrs operation and very quick charging

Flow Sensor



- The sensor comes with TrawlSpeed function and/or Symmetry and measures the waterflow's speed and side currents into the trawl opening
- The sensor is used to reduce fuel costs, increase efficiency and reduce loss of catch
- Used in the belly to avoid a bucket effect

Grid Sensor



- Used to efficiently sort out bycatch
- Measures the sorting grid's angle, indicating the catch volume
- Shows if the waterflow through the sorting grid is blocked

ScanMate 4/6



- Graphical presentations
- User-friendly interface
- Logging of data
- Advanced and reliable receiver technology
- Upgradeable to ScanBas

QBC-X1



- Configurable transmitting power and frequency
- Choice of quick or normal update rate
- Check of operation time and battery capacity
- Battery can be calibrated for max. operation

Scanmar - The Natural Choice for the New, Innovative Trawler Gadus Poseidon



Gadus Poseidon, Norway

Owner:	Havfisk AS (former Aker Seafoods)
Type of vessel:	Stern Trawler
Built:	2013
Horsepower:	2 x 3300 hp
LOA:	69,8 m
Beam:	5,6 m
Cargo capacity:	1350 m ³
Gross tonnage:	3441 tons

Gadus Poseidon is the first in a series of three new advanced trawlers for the Norwegian ship owner Havfisk AS. The trawlers have a highly innovative profile and are developed primarily for catching cod, haddock and saithe. In addition they also have capacity for prawn trawling. The new vessels have a total length over all of 70 meters and can accommodate up to 25 persons, but will under normal operation be the workplace for 15 crew members.

The vessels are designed by VARD (former STX OSV), together with Havfisk, and environmental performance and operational efficiency have been in focus throughout the developing process. The unique design reduces the energy requirements in all operational modes, and sufficient water flow towards the propellers and stability secure high efficiency when trawling at low speeds. When towing head-up against waves the energy requirements are lower compared to other designs due to the shape of the hull. VARD explains that they have drawn on experiences from other types of vessels in the new design, especially from the offshore support market.

The new generation trawlers have a well proven hull design which reduces fuel consumption, creates a smoother speed and improves the comfort in all weather conditions.

Gadus Poseidon is the first Norwegian-built trawler utilizing two propellers and diesel electric power. Four generators produce electricity for the operation, including winches and the two main engines. The dual propeller installation provides a much higher efficiency and significantly lowers fuel consumption compared to conventional installations.

The vessel is fitted with the latest technology in fish finding and catch control. The chosen solution has been developed in close cooperation between Havfisk and Scanmar. The skipper is able to maintain control

of the fishing gear through the whole fishing operation with a complete ScanScreen system with three screens strategically mounted in front of the skipper's chair.

A set of fully configured SS4 Door sensors with the new twin trawl extended distance functionality, angle and depth provide optimal control over the trawl doors performance at all stages of the haul. The nets are equipped with TrawlEyes and TrawlSpeed sensors, whilst the filling of the cod end is monitored by a number of SS4 Catch sensors with filling indicator. In addition the vessel is prepared for installation of noise hydrophones and steerable trawl doors.

Providing for the quality of the catch is also an important element in the project, and the onboard factory is planned with the intention of improving processing and freezing capacities significantly without affecting the quality of the product. With a capacity of 80 tons per day Havfisk aims to increase the quantity of catch and amount of processed fish by 10 percent per day, compared to vessels with the same number of crew.

The entire packing process is fully automated. Blocks of frozen fish from the vertical freezers are handled by robotics, palletized automatically before being stowed safely by a forklift truck in the vessel's freezer storage.

The onboard fish flour plant provides an opportunity to exploit all portions of the fish so that nothing is going to waste. This adds as an additional element in an already sustainable fishery.

Gadus Poseidon was also nominated for the "Ship of the year" award at Nor-Shipping 2013. Havfisk's two future vessels, Gadus Njord and Gadus Neptun, are planned to be delivered in the last quarter of 2013 and the first quarter of 2014.



Is Your Bridge System Upgraded to the Latest Software Version?

We are constantly making major and minor changes in the software to enhance the user experience and enable new functionality. Version 7 has several new features and improvements and is available for all bridge systems.

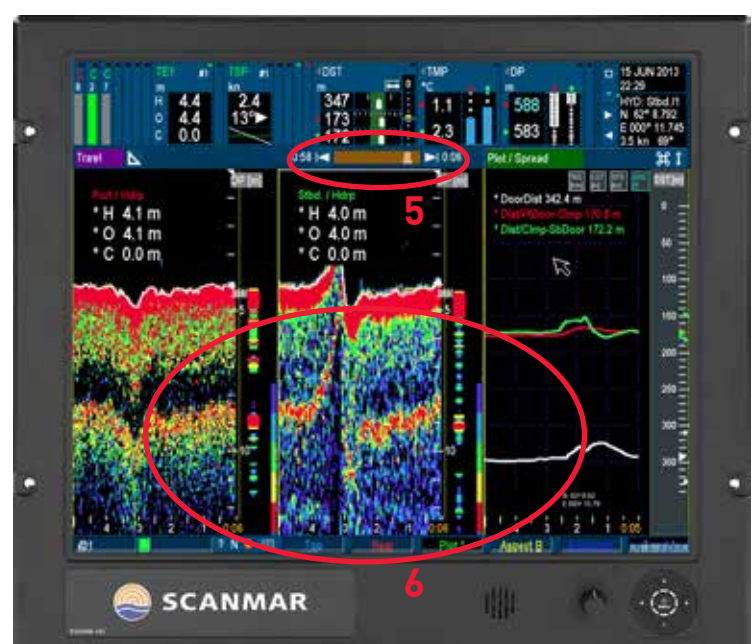
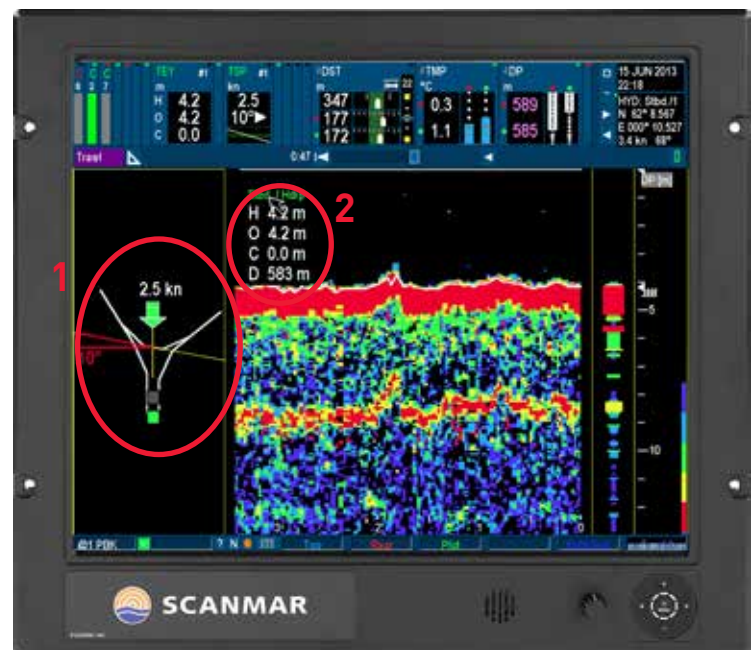
The main benefits in software version 7 include:

- (1) New 2D display of trawl geometry in the TrawlEye image is introduced as an option to allow better control over the trawl symmetry and TrawlEye information at the same time.
- (2) TrawlEye foot rope detection improved; providing better control of the height, trawl opening and foot rope's position above seabed (clearance).
- (3) Combined sensor boxes for door depth, temperature and extended twin and triple trawl distance measurements that show the measurements in relation to each other. For twin and triple trawl configuration it also displays the clump's position relative to the center line between the doors. New Rip and Upside down sensor boxes.
- (4) New graphic view of door angle measurements makes it easier to keep control of both roll and pitch angles.
- (5) Improved storage and logging of TrawlEye data and other sensor data. You can now review and analyze up to 12 hours of towing by scrolling back in time. This gives you an overview over the entire haul and lets you identify where the catch was good and decide the next course of action.
- (6) The option for triple split screen displays three images simultaneously on a large screen, for example two TrawlEye images and one echo sounder image. This way you don't have to switch between the images.

Tool tip and Help menu introduced.

New user friendly sensor configuration screen.

For an upgrade, please contact your local Scanmar dealer or our Sales Department, tel. +47 33 35 44 00.



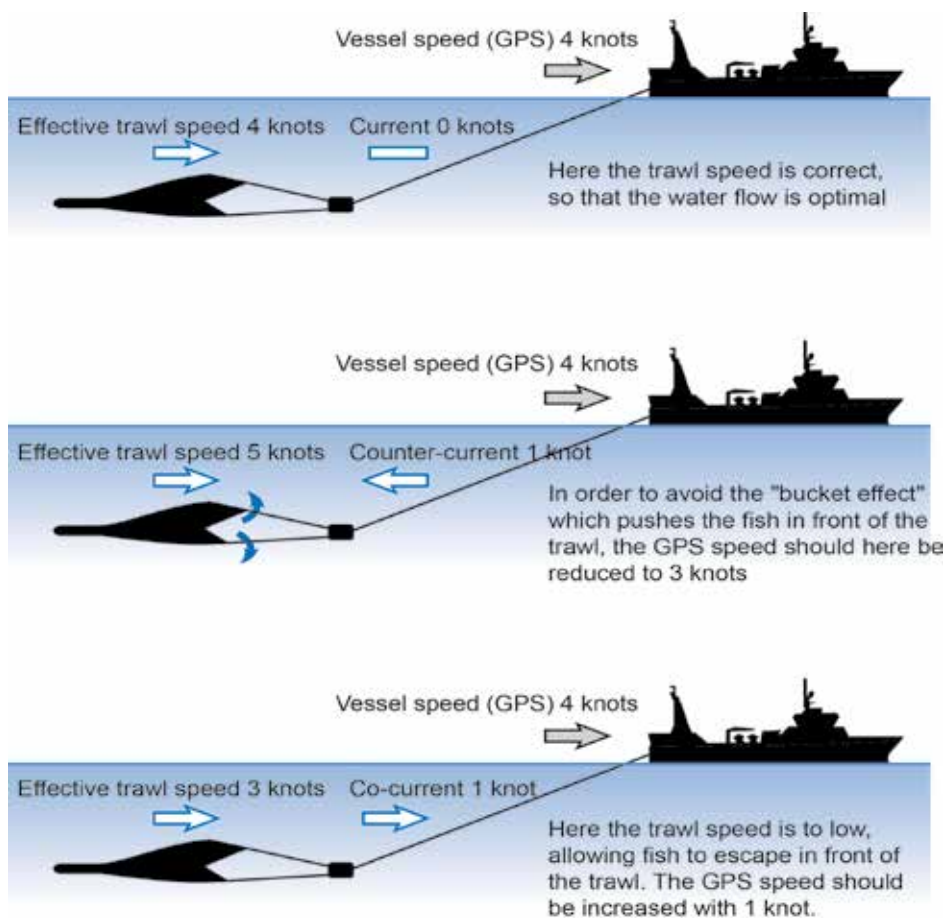
It is Not Enough to Assume. You Must Know.

- Scanmar TrawlSpeed/Symmetry sensor for full control of the trawl geometry
- Correct trawl speed reduces fuel consumption

Together with DoorAngle sensors, Scanmar's TrawlSpeed/Symmetry sensor is perhaps the most important tool for achieving perfect control of the trawl geometry. In effect, this again ensures an effective and successful fishing operation and reduces fuel costs.

The Flow sensor is an indispensable sensor for single and multi-rigged trawlers. The TrawlSpeed function enables the skipper to find the optimal towing speed by measuring the speed of the water flow into the opening, bearing in mind the side currents. Side currents are factors that MUST be taken into account when towing, as they most certainly will result in the towing speed deviating from the vessel's speed over ground.

An experienced skipper will know the consequence of towing the trawl too fast through the sea; a "bucket effect" will be created in the trawl, forming an area of pressure and pressing the fish out through the expanded meshes and side panels, not to mention the increased fuel consumption. On the other hand, if towing too slowly, the fish will have time to escape in front of the trawl. The solution is therefore to adjust the speed over ground in relation to the down or up-stream currents to ensure an effective haul.



Perhaps even more interesting is the effect side currents have on the trawl symmetry. Many skippers may take for granted that the trawl's position in the water is optimal when the warp lengths are equal and the pressure on both winches is the same. However, side currents have a big effect on the symmetry and will lead to a skewed and ineffective trawl, as the meshes will be closed on one side and wide open on the other, allowing the fish to pass through the side panel.

It is not unusual that much of the expected catch is lost due to incorrect warp lengths in relation to the flow. Therefore, it is very important to adjust the warp lengths as well as the door angles to ensure perfect geometry.

Many of our regular customers have over the years used the Flow sensor (with TrawlSpeed function, Symmetry or both), and the feedback has been very positive. Some of the skippers have had such a great advantage of the sensor that they can't imagine fishing without it. As they claim; knowing the exact towing speed and having the right geometry is something one must know for sure and not just assume in order to make the best possible decisions and catch most fish.

The use of Flow sensor has increased also in North-West Russia. A few vessels have used the sensor for a number of years, but now several other skippers have decided to test the benefits of the sensor. Earlier it was widely and mistakenly believed by many that the Flow sensor was only beneficial for multi and pair trawlers, and as this fishing method was not so common in the area, the sensor was therefore considered superfluous.

However, trends are changing.

Konstantin Shishkin, the deputy managing director of the marine technology specialist Pobedit Co. notices that more and more ship owners are interested in the Flow sensor, as the competition gets tougher, and the economic benefit of using the TrawlSpeed/Symmetry measurements becomes more evident. He explains the sensor functionality to his customers in the following manner:

-The flow sensor shows the true speed of the trawl. Its speed is different from the GPS speed or vessel's speed through water. Also, information about the trawl symmetry is needed to correct the operation of the winch system. When fishing close to uneven sea bed, the trawl's position and symmetry is most important. Several ship owners have already chosen to invest in the TrawlSpeed sensor.

Mr. Shishkin concludes that there is a trend where Russian vessels are more focused on the effectiveness of their operations, and several vessels have already improved their capabilities by using the TrawlSpeed sensor during single, twin and pair trawling.

Don't let the Fish Escape Through an Asymmetric Trawl!

The TRAWLSPEED/SYMMETRY sensor gives you the information you need to adjust warps and towing speed.



Towing Speed, Towing Resistance and Catch are Critical Factors, but What About Fuel Consumption?

The right towing speed relative to the design and rigging of the doors and net is important during fishing. We see more and more fishermen using the effect of towing with the current to cover greater areas.

There is also a decisive relationship between towing speed and fuel consumption. It is therefore important that the towing speed is adjusted so that the trawl is towed at an optimum speed through the water and covers the greatest possible area with minimal towing resistance.

In order to meet this challenge, it is necessary to know the currents at the trawl's location. Many are aware of that the vessel's speed above ground does not show the trawl's speed through the water. But some try to interpret other information such as the winch tension to adjust the towing speed. The problem is just that this will never provide clear information since conditions change for different reasons:

- Hard or soft sea bed
- Wire lengths and depth
- Even sea bed or slopes
- The doors' performance
- Straight or skewed trawl
- Filling of the cod-end

The experience from vessels operating in areas with strong currents is clear. When we ask if they are certain they catch more by towing only with the current - taking into account the time lost returning to the starting point - the answer is unambiguously yes. Previously, when they towed in both directions, the vessel barely moved against the current because of the strong underwater currents, and the catch was poor.

Some will say that this is only relevant in extreme current conditions, but let's do a simple calculation. Let's say you have a trawl design with an optimal towing speed of 3.5 knots, and the haul normally lasts 5 hours.

By towing at the trawl's optimal towing speed, you will trawl over an area of:

- 17.5 nautical miles with no current
 - 10.0 nautical miles towing against a current of 1.5 knots
 - 25.0 nautical miles towing with a current of 1.5 knots
- In other words, you would cover an area over twice as big by towing with the current, as opposed to towing against it.

If you want to return to your starting point at an assumed transit speed of 10.0 knots over ground, you would in the examples above need:

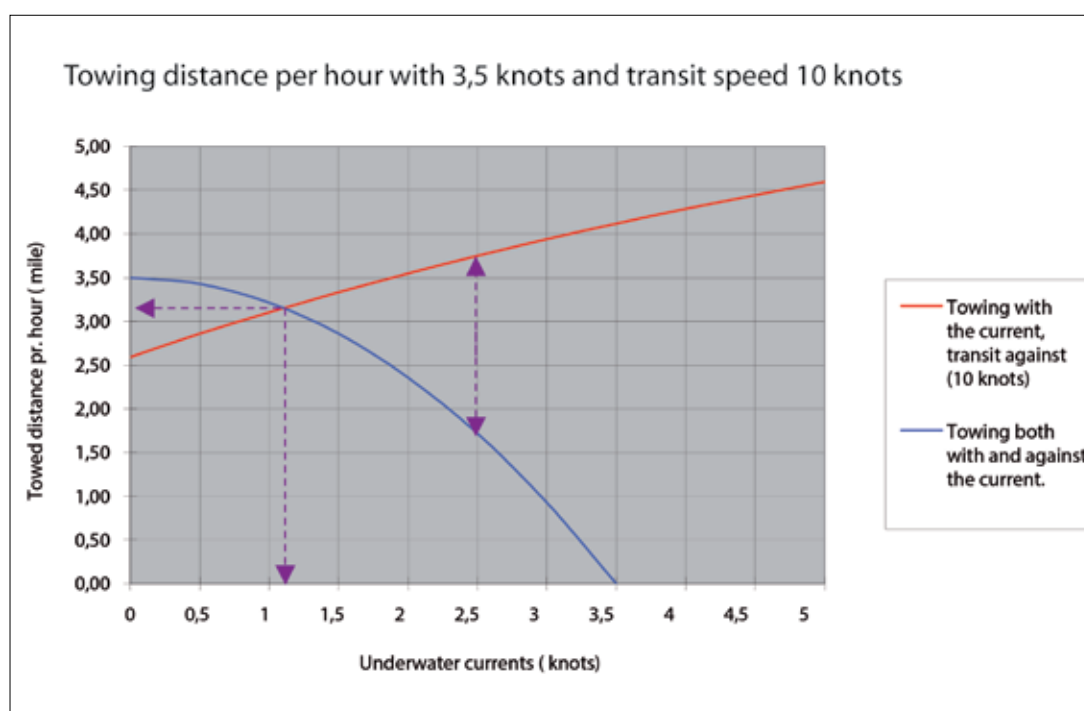
- 6 hours 45 min
- 6 hours
- 7 hours 30 min

We need to add the use of bunkers in the calculation to get the full picture. The calculation above may not be relevant to all, but the conclusion is that the greater the current, the more profitable it is to tow with the flow.

Most vessels today operate with doors rigged inwards to avoid them falling outwards, and with wires on the safe side to avoid that the sweeps and gear lose bottom contact.

If one could optimise the doors' performance, wire lengths, rigging of the trawl and bottom gear; this would have a significant effect on fuel consumption.

A couple of simple comparisons can be made to show the optimal length of towing with/against the current before returning to the starting point, or towing with normal speed, but this diagram can be applied by anyone according to their own conditions.



Where the curves intersect the underwater current is approx. 1.1 knot (horizontal axis) and both techniques will cover the same ground, approx. 3.2 nautical miles per hour (vertical axis).

With underwater currents of less than 1.1 knots it will be beneficial to tow back and forth (the blue curve is above the red).

With underwater currents above 1.1 knots it will be beneficial to tow only in one direction and go back to starting point (the red curve is above the blue one).

Note how big the difference is as the underwater current increases. For example, at 2.5 knots the difference is nearly 2 nautical miles per hour (height of the arrow).

Here we have for the sake of simplicity only shown one example. It is of course possible to alter these parameters depending on the conditions. If you would like a diagram for your own trawl and vessel, please contact us.

Optimal Symmetry = Efficient Trawl

When Scanmar started developing the SS4 generation of Door sensors, one of the criteria was to improve the symmetry control for twin and triple rig trawling.

The trawl's symmetry is affected by a number of factors in relation to each other. These include trawl symmetry in relation to the water flow, towing speed, height of the trawl opening, door distance and angles, and the filling rate in the cod end. When the trawl is in perfect symmetry it fishes optimally.

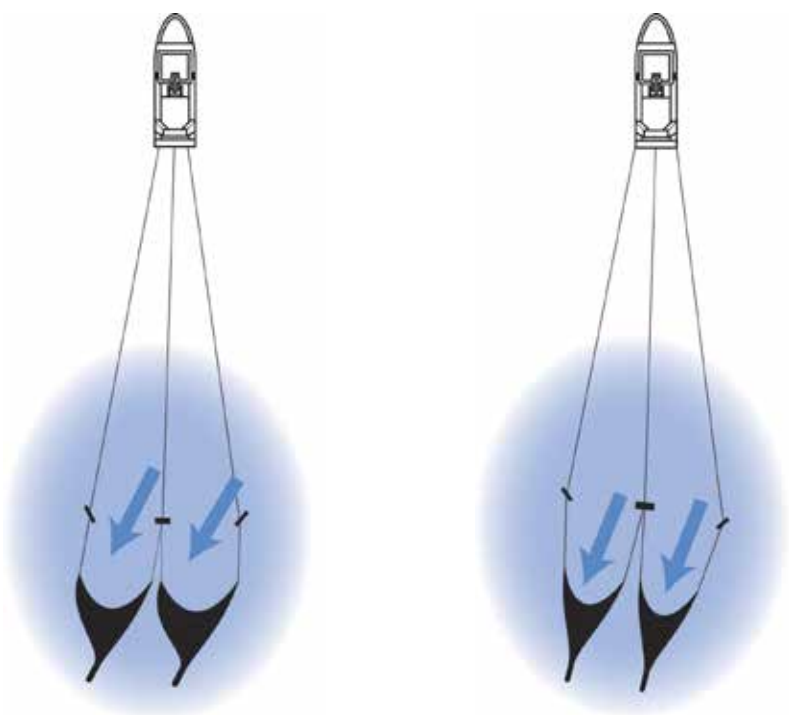
Correct door distance measurements with temperature variations

Many consider the door distance as one of the most critical measurements during all phases of the fishing operation. Access to correct and reliable information is therefore very important.

The door distance is measured by sending a hydro acoustic signal from a master sensor to a transponder/slave which returns the signal to the master. The distance is then calculated based on the speed of signal between the sensors. The speed of sound in water varies with the temperature, pressure and salinity, e.g. it is faster near the surface where the temperature usually is higher than on the bottom. This leads to inaccurate distance measurements. To assure correct data, the SS4 Door sensors measure the temperature and depth and then compensate the distance measurement in relation to the speed of sound in the area of the sensor's location.

Correct symmetry gives optimal efficiency

The angle of the water flow affects the trawl's symmetry and efficiency, and many use Scanmar's Flow sensor to control the trawl's symmetry in relation to the water flow. To optimize the fishing, the side currents must be compensated by adjusting one of the wires so that the water flow has an angle of 90° into the opening.



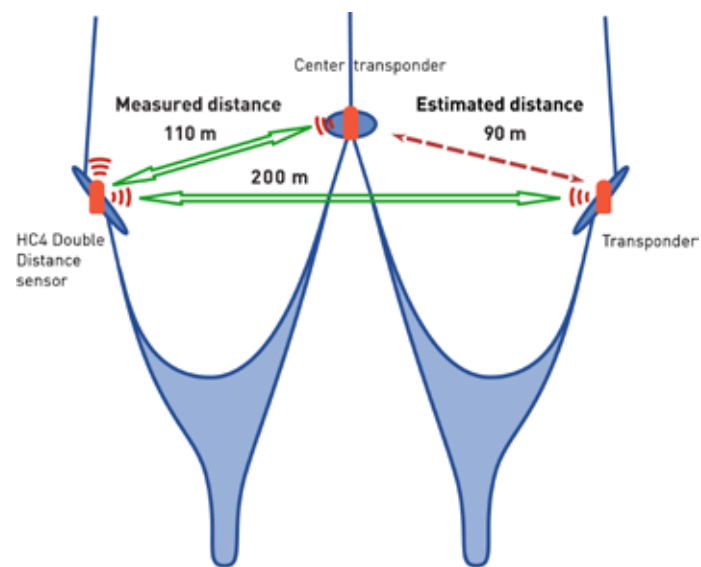
A side current creates asymmetry leading to a bucket effect and loss of catch through expanded mesh.

Starboard wire is adjusted so that the trawl is symmetrical with the water flow and fishes optimally.

Extended distance measurement

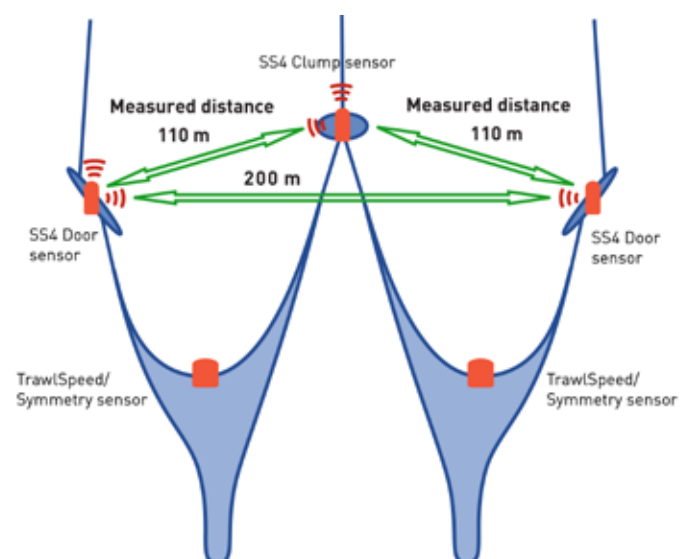
To avoid asymmetry when fishing with a twin or triple rig trawl it is important that doors and clump are in line. Information about the doors' and clump's position in relation to each other is therefore essential.

Traditionally distance measurements on twin and triple trawls have been based on the assumption that doors and clump(s) are in line. The distances from door-to-door and clump-to-port door have been measured, while the distance clump-to-starboard door has been estimated from the measured distances. However, this estimation is only accurate when the clump is in line with the doors.



To find the correct wire length on the center wire, many use geometric and mathematic tables. These calculation methods are in many situations inaccurate and don't account for side currents, fishing on a slope, wire tension etc. An indication that the clump is towed in front of or behind the doors is that the meshes on the inner or outer wings are clogged with fish.

Scanmar's new and extended distance measurement gives the exact distance between door-to-door, doors-to-clump and clump-to-clump on triple trawls.



The clump's actual position in relation to the center line is measured independently of the length of the wire, side currents etc. With the help of accurate distance measurements and information from the Symmetry sensor the skipper is able to optimize the trawl's geometry by adjusting the lengths of the wires, so that doors and clump are in line, also in areas with side currents. The data is presented graphically on the Scanmar bridge system.

Like the other sensors of the SS4-generation the Clump sensor is multifunctional and measures depth, angle, sea temperature and wire tension.

Accurate Distance Measurements with New SS4 Clump Sensor

Scanmar's new generation Clump sensor for twin and triple rig trawling was recently launched.

Together with the SS4 Door sensor the SS4 Clump sensor provides the accurate distance from clump-to-door, door-to-door and clump-to-clump (on triple trawl).

Last generation Distance sensors with a transponder on the clump only estimates the distance between clump and starboard door, and the measurement is therefore not accurate, unless the clump and doors are in line.

The new, extended measurements tell you if the clump is in line with the doors or not, so that the skipper can correct the trawl's geometry by adjusting the wire lengths. A trawl is most efficient when the geometry is optimal, i.e. when clump and doors are in line.

Since the speed of sound in water varies in relation to depth and sea temperature, the sensor also has a built-in temperature compensation which assures 100 % correct distance measurement.



- Measures the accurate distance between clump and both doors
- Multifunctional: measures depth, tension, sea temperature and angle
- Solid construction and plastic that protect well from damage and wear
- Up to 700 hours operation
- Fast charging

Early Filling Indication with SS4 Catch Sensor



The Icelandic stern trawler fishes Cod, Haddock, Greenland Halibut, Ocean Perch and Mackerel and has a ScanBas system with Catch sensors, TrawlEye, TrawlSpeed sensor, and Door sensors. This spring they invested in a new SS4 Catch sensor with filling indicator.



Skipper Hilmar E. Helgason:

- We have been using the traditional Catch Sensors from Scanmar for many years. When the new SS4 sensor with angle measurements was introduced, I wanted to try it and was especially interested in the benefits of the angle option.

It took some time to understand what the sensor was really showing, but we found out that it gave us very useful information about the movement of the belly and the cod end. Being able to see the pitch and roll angle on the cod end gave us a very clear indication about when the cod end was empty, when fish was entering and when it was filled up.

Compared to the traditional Catch sensors we used before, we are now able to get a much earlier indication of the filling.

We have been fishing Greenland Halibut down to 1200 meters. Since we started using the angle function of the new SS4 sensor, we can easily see when and where we get fish.

We only have one SS4 sensor with the angle option, but now I want to try two sensors at the same time; one on the cod end and one on the belly. During Mackerel fishing I'm sure the second SS4 sensor will help us follow the filling even better.



Hrafn Sveinbjarnarson GK, Iceland

Owner: Thorbjörn hf, Grindavik
 Vessel Type: Stern Trawler
 Built: 1988
 LOA: 48 m
 Beam: 11 m
 Gross Tonnage: 1028

French Fish Soup - Bouillabaisse



Ingredients:

- 1 onion
- 2 leek
- 1 garlic clove
- 1 fennel (one large or two small)
- 4 fresh tomatoes (or canned, diced)
- 4 potatoes
- 0.3 pints (1.5 dl) olive oil
- 3.4 pints (2 ltr) stock of fish and shellfish
- 4.4 pounds (2 kg) of fish and different kinds of shellfish
- 1 orange (zest and juice)
- 2 bay leaves
- 1 anise
- pinch of saffron
- 2 teaspoon salt (if the stock is unsalted)
- 1 teaspoon freshly ground pepper
- A few sprigs of fresh thyme

Instructions:

Wash and clean the fish, prepare it for the soup and put it in the fridge meanwhile with a pinch of salt.

Make a stock of the offal. Boil and reduce it to the wanted quantum. If needed, you can add some broth and/or white wine. If you want the soup creamier, add cream or crème fraiche.

Chop the leek, onion and garlic in small pieces and fry it in oil in the soup pot.

Skin the tomatoes and chop in small pieces, cut the fennel in thin slices, peel and cut the potatoes in slices and chop the orange zest finely.

Add all to the pot together with bay leaves and chopped thyme. Bring to a boil.

Grind the saffron and put it in a small bowl. Pour some of the hot soup over it and let it sit for a little while, before you put it in the soup pot.

Let the soup simmer for 20 minutes.

Add the fish and shellfish and let it cook for a bit. The soup doesn't have to boil, but it should be hot when serving.

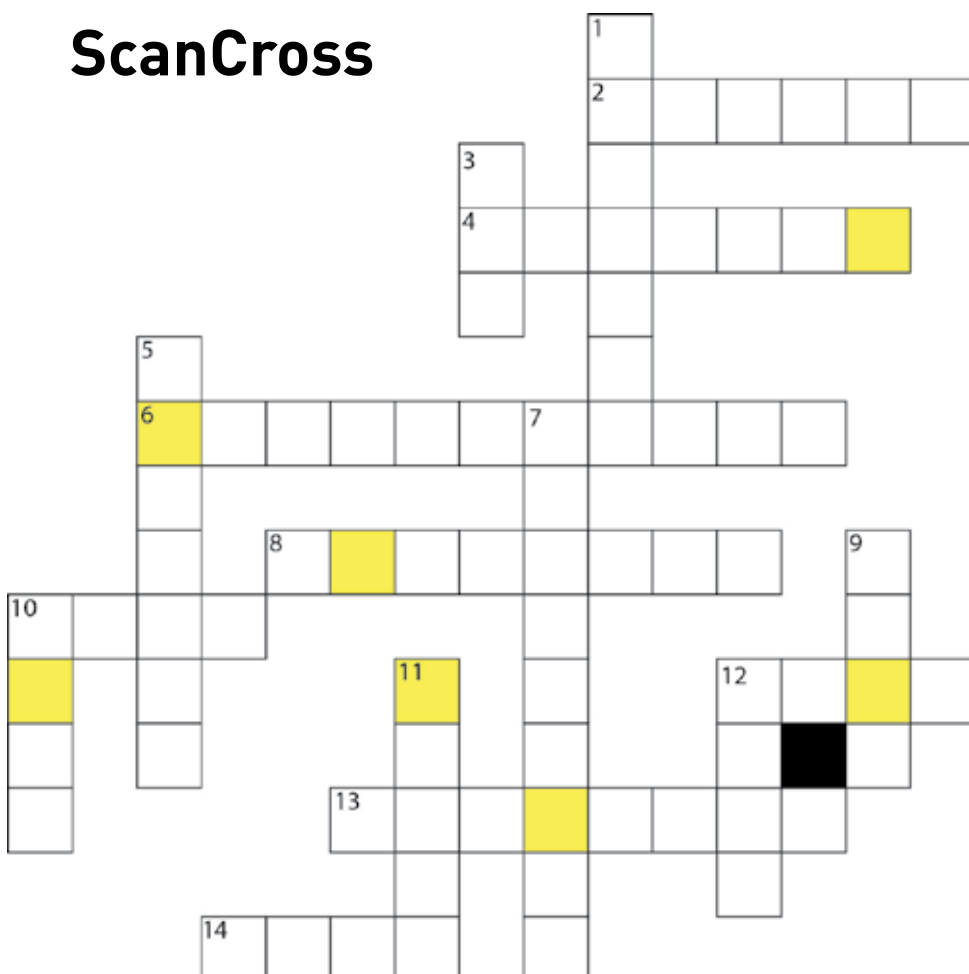
Serve with bread and butter/aioli.

PS. Don't hold back on the ingredients. It's just the creativity that sets the limit. And the secret lies in the stock; use a lot of shellfish, white wine, herbs etc.

Bon Appétit!



ScanCross



Across

2. Scanmar's programming and charging unit
4. Your Eyes Under Water
6. One of Norway's largest export industries
8. Dried and salted cod
10. Fish
12. Seabird
13. Maritime
14. Head sea

Down

1. Norway's national drink (spirit)
3. Scanmar's new generation sensors
5. Dish with dried fish, potato, onion, olive oil, tomato paste
7. World's largest floating fish factory
9. Average
10. Marine mammal
11. Largest marine mammal
12. Norwegian cod liver oil

Send in and win price!

Make a word of the letters in the yellow boxes and send it with your name, post address and telephone number to: contact@scanmar.no. Please use "ScanCross" as subject.

