

Accessories

The standard range of StarFish Seabed Imaging Systems come with everything you need to get you started;

- A quick start guide
- Top box
- StarFish Scanline
- Software CD
- StarFish mains power adaptor
- StarFish DC power lead
- USB 2.0 cable
- GPS receiver
- Stainless steel rigging shackle
- 20m cable as standard
(Please note 450F and 450H models are fixed cables).

The following accessories are recommended optional extras or replacements for your system:



StarFish Peli™ Case
Part No. BP00052



StarFish GPS Receiver
Part No. BP00070



StarFish Pole Mount Bracket
Part No. BP00067



StarFish 50m Tow Cable
Part No. BP00231



StarFish 20m Tow Cable
Part No. BP00235

StarFish Scanline Software

The intuitive, easy to use data acquisition and logging package for the range of StarFish Seabed Imaging Systems, allows you to display StarFish side scan sonar imagery in real-time and digitally record along with data from other devices such as GPS receivers, compasses and speedometers.

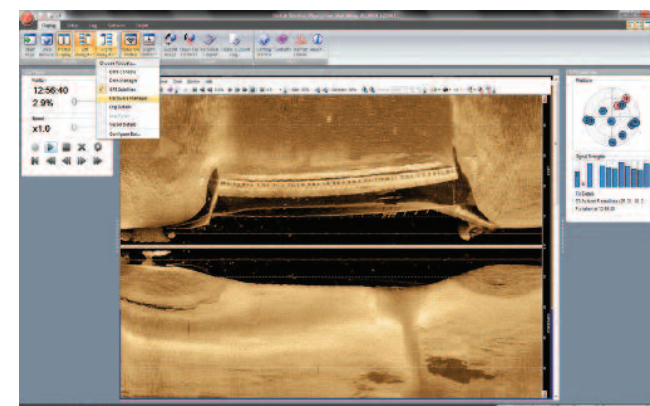


Image of a submerged dam, Lake Conroe, TX, USA, image courtesy of Subsea Technologies Inc., Katy, TX.

Key Features include:

- Data Export Wizard - export as XTF files
- Screen capture function (BMP, PNG, TIFF, JPG)
- Comprehensive integrated help system
- Supported software packaged includes Hypack and SonarWiz
- Software Development Kit (SDK)
- Compatible with 32bit & 64bit Windows OS (XP/Vista/7)
- Clever use of interactive displays, tabbed menus and 'widgets'
- Software Development Kit (SDK) - for advanced users who wish to integrate a StarFish side scan system into their own new or existing software package
- StarFish Scanline and the SDK are available for download free of charge from the Trittech website

StarFish
Seabed Imaging
Systems



Product Specifications

SONAR	StarFish 990F	StarFish 452F	StarFish 450F	StarFish 450H	StarFish AUV
System* Part Number	BP00181	BP00184	BP00017	BP00090 (20m) or BP00066 (5m)	S10699
Frequency	1MHz CHIRP	450KHz CHIRP			
Operating Range	35m (115ft) per channel	100m (328ft) per channel			
Horizontal Beam Width	0.3°	0.8°	1.7°	0.5°	
Vertical Beam Width	60°				
Transducer Angle	Tilted Down 30° from Horizontal			Variable (OEM Specified)	
Length	378mm (14.88")	195mm (7.68")	432mm (17.0")	Each Transducer	
Width	110mm (4.33")	130mm (5.12")	41mm (1.61")	Each Transducer	
Height	97mm (3.81")	35mm (1.38")	18mm (0.71")	Each Transducer	
Weight (in Air)	2.0kg (4.41lb)	0.7kg (1.54lb)	0.35kg (0.77lb)	Each Transducer	
Construction	Reinforced polyurethane rubber				
Colour	High-Vis Red	High-Vis Yellow	Black		
Depth Rating	50m (164ft)			300m (984ft)	
Connector	Impulse, 5-way (MCIL-5-FS)		N/A		
Supported Software Platforms	Hypack 2009, SonarWiz.MAP/SonarWiz 5 (Chesapeake Technology), Quester Tangent SWATHVIEW system, CleanSweep-Lite (Oceanic Imaging Consultants, Inc.) and GeoDAS (real-time alternative software).				
Applications	Law Enforcement/ Homeland Security, Wreck Location/ Archaeology Survey, Engineering, Dive Clubs, Academic/ Research, Angling/ Fishing				
TOP-BOX					
Model	990	450		450 (Un-housed PCB)	
Supply Voltage	90-264VAC, 47-63Hz or 9-28 VDC				
Power Consumption	6W (500mA @ 12VDC)				
Power Interface	2.1mm DC jack socket				
PC Interface	USB 2.0 B-Type connector				
Sonar Interface	6-Way Souriau "UTS" female socket			Pin Header	
Length	166mm (6.54")	163mm (6.41")			
Width	106mm (4.17")	100mm (3.94")			
Height	34mm (1.34")	15mm (0.59")			
Weight (in Air)	0.4kg (0.88lb)	0.1kg (0.23lb)			
Temp Range	-5°C to +40°C (23°F to 104°F)				
IP Rating	IP50 (Protection against ingress of dust, no protection against ingress of liquids)			None	
CABLE					
Length	20m (65ft) as standard or additional 50m (164ft)	20m (65ft)	5m (16ft) or 20m (65ft)	Custom	
Construction	Black polyurethane jacket with internal Kevlar reinforcing (strain) member				
Breaking Strain	>150kg (330lb)				
Minimum Bend Radius	30mm (1.2")				
Connector	Impulse, 5-way (MCIL-5-FS)		N/A		N/A
PELI CASE					
With System	Yes		No		

* StarFish can be purchased as separate heads in addition to the system part numbers quoted. All specifications are subject to change in line with Trittech's policy of continual product development.

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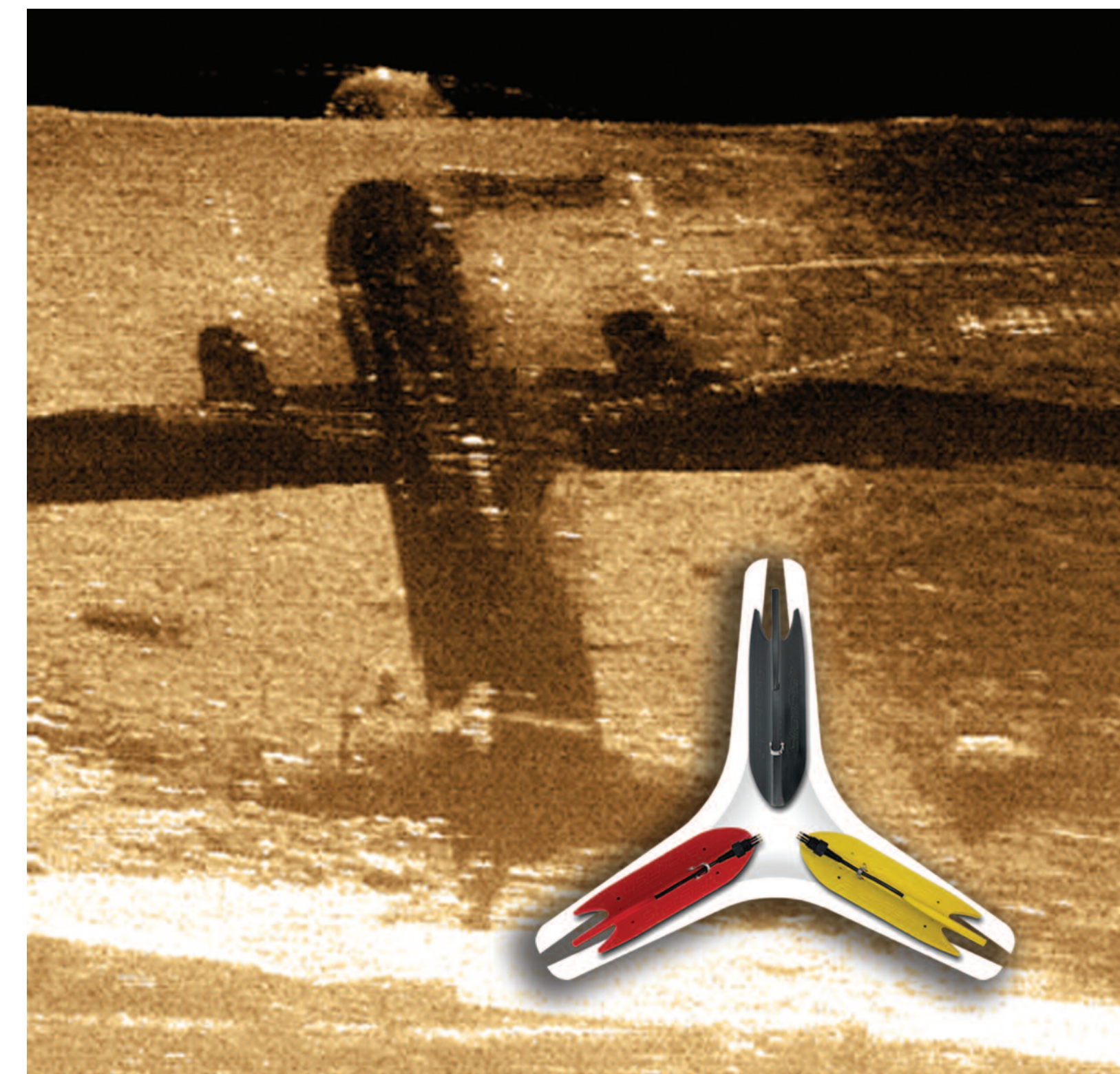
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StarFish
Seabed Imaging Systems



The Compact Side Scan Sonar Range for Shallow Water Surveys



Introduction to Tritech's StarFish Seabed Imaging Systems - Side Scan Sonar Range

StarFish Seabed Imaging Systems are some of the most portable, shallow-water side scan sonars available on the market and have been designed with portability and simplicity in mind; StarFish sonars are ideal for shallow water operations, including port and harbour surveys, wreck hunting and Search and Rescue (SAR) missions.

• High Performance Imaging -

utilising CHIRP¹ acoustic technology and DSP² techniques

StarFish sonar systems have the ability to detect small closely spaced targets at far greater distances than conventional single frequency, monotonic systems: by sweeping the acoustic transmission from one frequency to another, the bandwidth of this 'chirped' signal allows closely spaced targets to be imaged individually instead of typically becoming merged into one larger target.

CHIRP techniques also help to remove random or out-of-band noise, therefore reducing the risk of acoustic interference.

• Advanced Design –

the signature full-body three-fin hydrodynamic design

The unique design improves stability of the sonar during towing and ultimately helps to ensure the system produces the highest quality sonar images possible and measuring less than 15" long, StarFish sonars are extremely portable.

• Simple Operation -

'plug & play' technology

StarFish Seabed Imaging Systems connect to a PC/ laptop via a top-box with USB connection (AC or DC powered), in addition, StarFish Scanline software has an easy-to-use interface and has been designed for Windows operating systems.

Cover image: Cover image: Emerald Airways Hawker Siddeley HS-748. StarFish 990F sonar image of an Emerald Airways Hawker Siddeley HS-78. G-BVOV. The acoustic shadows cast by the sonar, onto the seabed, shows further detail of the Siddeley's outline; including the cockpit, wings and tail fin, captured at Capernwray Diving Centre, Lancashire, England.

¹ Compressed High Intensity Radar Pulse

² Digital-Signal-Processing

Key Market Applications

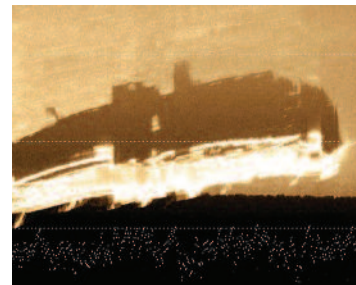
StarFish Seabed Imaging Systems are ideal for shallow-water survey applications in water depths up to 30m/100ft. Use the StarFish system to map a waterway, identify a target site or identify potential hazards before divers enter the water.

Search and Rescue (SAR) / Law Enforcement³



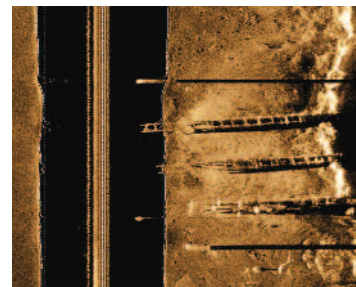
Assist in the identification of submerged evidence from a crime scene, perform a harbour patrol, retrieval of evidence or search for mines or other explosives.

Wreck Hunting/ Archaeological Survey/ Academic and Research⁴



Wreck and cargo discovery, dive site navigation, wreck debris discovery, marine archaeology, professional geological surveys and marine environment monitoring.

Engineering⁵



Salvage operations, inspection of coastal structures, planning of seafloor installations, dredging operations, pipeline/ cable location and inspection and dam inspection.

³ StarFish 990F image of a SAR diver on the seabed and a training mannequin.

⁴ StarFish 450F sonar image of the World War II (WW2) ship, SS Rose Castle; visible structures, include rigging, substructures and cargo holds at approximately 160 ft. Image courtesy of Andrew Hiscock, Ocean Quest Adventure Resort (OCAR), Newfoundland and Labrador, Canada.

⁵ StarFish 452F sonar image of submerged pilings. Image courtesy of Marek Szatan.



StarFish Seabed Imaging Systems - Side Scan Sonar Range



StarFish 450 series – entry level and increased image resolution systems

- The original 450 series offers a powerful side scan sonar system with good, clear image definition and is available in a towed or hull mounted option
- The 452F model has a narrower horizontal beam resulting in higher resolution images
- 100m per channel
- An inline connector permits upgrade to a longer deck cable (see the accessories page)



StarFish 990 series - higher-resolution system

- Higher frequency (1MHz) CHIRP transmission with extremely narrow horizontal acoustic beam, providing higher resolution for enhanced image definition and target detection
- Optimised for SAR operations; where target identification and high-definition underwater mapping of the seafloor are critical in the search and recovery of missing persons

StarFish OEM – developed for bespoke integrations

The StarFish OEM side scan sonar option offers impressive coverage and crisp images with a 450kHz operational frequency.

CHIRP transmission as per standard models and 100 meter range this is a comprehensive side scan for your ROV or AUV.



Features

- Compact and lightweight unit; quick to deploy and no pre-installation required
- Full-body, three-fin, hydrodynamic design, to improve operational stability
- Easily powered from almost any source
- Simple, intuitive software (StarFish Scanline)
- Utilises the latest digital electronics and acoustic Compressed High Intensity Radar Pulse (CHIRP) and Digital-Signal-Processing (DSP) techniques

Benefits

- Easily transportable, fits in a small rucksack
- Plug & Play, ease of use with USB interface to a Windows™ PC
- Ease of integration, Software Development Kit available
- Obtain GPS reference positions of seafloor targets
- Fast evaluation of waterways and unknown hazards
- Large area search from any surface vessel

Image courtesy of Ari Kapanen from DeepTech, taken in the Gulf of Finland and shows a Finnish steamship at a depth of 33 metres.