

Cygnus Subsea Range Ultrasonic Thickness Gauges

Available in 300m, 500m, 2,000m & 4,000m Depth Rated Models



CYGNUS *Brilliant Solutions in Ultrasonic Measurement*

Key Features

At Cygnus, our priority is to listen to our customers to ensure that our products are designed for the real world. We have focussed on **ease of use, accuracy and durability** when creating all of our subsea thickness gauges.

We have strategically-placed Cygnus Service Centres across the globe, who are highly trained in order to provide the excellent service and support that Cygnus is renowned for.

Cygnus is the original pioneer of the Multiple-Echo measuring technique. We have a long and proud history of offering our customers superb quality and service since 1983.

EASY TO USE

Using a Cygnus instrument to take a thickness measurement is quick and simple. Gauge menus are intuitive and easy to navigate. 'Auto-log' feature further enhances convenience.

RELIABLE

Measures Through Coatings

Cygnus' original technique uses three return echoes to give a truly accurate, error checked metal thickness measurement (through coatings of up to 20mm (0.8")).

Accepted by all major classifications societies.



RANGE OF SUBSEA THICKNESS GAUGES

Cygnus Diver Range

Cygnus has 2 diver underwater thickness gauges; a wrist-mountable gauge with a large colour display offering A-scan and multi-measuring modes and our original diver-held underwater gauge. Both units are rated to 300 msw.

Cygnus ROV Mountable Range

Designed specifically to be mounted onto an ROV, Cygnus has 3 ROV models in their range, the Mini ROV pressure tested to 500 m, the M5-ROV-2K depth rated 2,000 m and the M5-ROV-4K which is depth rated 4,000 m.

Cygnus Options & Accessories

There are a range of options and accessories available to assist the user with obtaining, viewing and recording thickness measurements.

NO NEED TO REMOVE COATINGS

THREE VERSATILE MEASURING MODES

Multiple-Echo (Standard Measuring Mode using Single Crystal Probes)

Gives the most reliable and accurate remaining thickness measurements, with no need to remove coating (up to 20 mm thick (0.8")).

Echo-Echo (Available with Cygnus DIVE using Twin Crystal Probes)

Measures through coatings of up to 1 mm (0.04") thick, ideal for measuring painted metals with back wall corrosion.

Single-Echo (Available with Cygnus DIVE using Twin Crystal Probes)

Ideal for measuring uncoated metals with heavy corrosion. Also effective on a range of cast metals, plastics and composites.

CYGLINK SOFTWARE

CygLink is a Windows based application used to transfer and manage data logger records, A-scans, templates, measurement comments and material velocity tables. The program can generate PDF reports and export to Excel. It also displays A-scans, allowing for after-the-event analysis of logged measurements.

DATA LOGGING

The Cygnus DIVE offers simple, easy to use linear data logging and has the ability to auto-log; this is a function that automatically logs measurements, without pressing any buttons, for 'hands-free' convenience.

A-SCAN DISPLAY

The Cygnus DIVE offers A-scan display, which shows the ultrasonic echo, in visual form, used for analysis and verification.

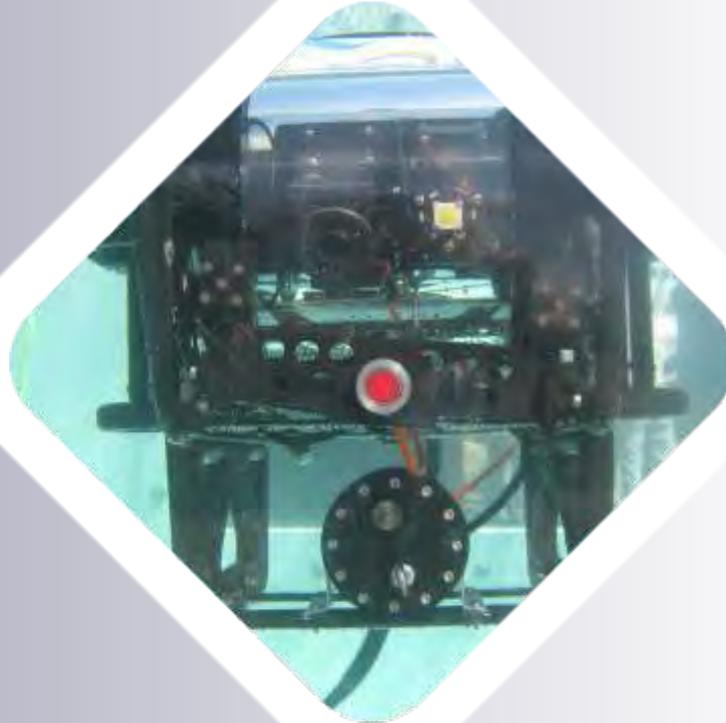


Made in the UK



All Cygnus thickness gauges are supplied with a 3 year warranty as standard

Cygnus ROV Mountable



M5-ROV-4K



M5-ROV-2K

Specifically designed for underwater remotely operated vehicles, Cygnus offer two dedicated ROV mountable thickness gauges, M5-ROV-2K (depth rated 2,000 m) and M5-ROV-4K (depth rated 4,000 m). These gauges are versatile and designed to measure metal thickness through coatings in the harshest operating conditions.

Key Features:

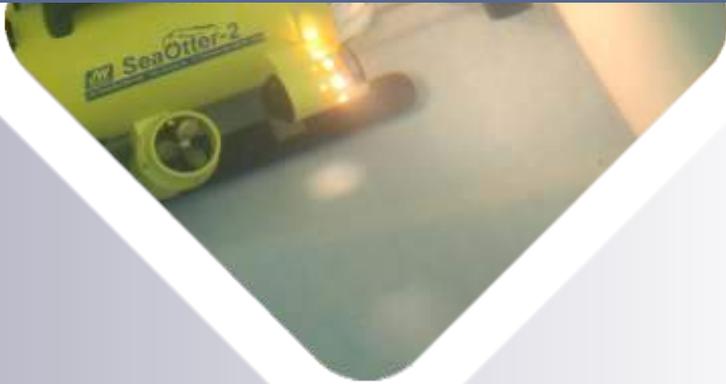
- Supplied with CygLink software to display and log thickness measurements from the ROV on a computer at the surface which can be saved to a file and presented as a report.
- Selectable Deep-Coat mode for measuring through coatings up to 20 mm ($\frac{3}{4}$ ") thick.
- The gauge connects to the surface via a serial link. RS-422 can be used with an umbilical up to 1,200 m. RS-232 can be used to connect to a multiplexer.
- Fitted with a safety Pressure Relief Valve and Securing Eye.
- Easy calibration at the surface via CygLink software or Top Side Repeater (TSR) unit.
- Removable end plate for full serviceability with access to the Option Switches, Fuse and Status LED.
- Wet mateable 'MC' style underwater connectors.
- The Cygnus Topside Repeater is available as an option and has the facility to display the thickness measurements remotely and overlay them on to a video signal. This allows the measurements to be superimposed on the ROV camera's monitor screen.

Available in 2,000 msw & 4,000 msw - Pressure Rated Models

Materials	Sound velocities between 1000 m/s and 9995 m/s
Measurement Range in Steel	3 mm - 250 mm (0.110" - 9.994") with 2.25 MHz probe 2 mm - 150 mm (0.065" - 6.000") with 3.5 MHz probe 1 mm - 50 mm (0.045" - 4.000") with 5.0 MHz probe
Accuracy	±0.1 mm (±0.004") or 0.1% of thickness measurement, whichever is greatest, when calibrated in accordance with Cygnus Instruments calibration procedure
Resolution	0.05 mm (0.002")
Probes	Single crystal soft-faced compression 13 mm (½") - 2.25, 3.5 or 5 MHz (lower frequency probes offer better penetration on heavy corrosion/coatings)
Power	7.0 - 30 V dc @ 150 mA (max)
Size	88.90 mm (3.50") diameter x 205 mm (8.07") long (inc. fittings)
Weight in Air	Model M5-ROV-2K = 0.900 kg (2.150 lbs) Model M5-ROV-4K = 4.100 kg (9.039 lbs)
Operating Temp.	-10°C to +50°C (14°F to 122°F)
Testing	Model M5-ROV-2K tested to 3 km (9.842 ft) depth Model M5-ROV-4K tested to 6 km (19,685 ft) depth
Communication	RS-422, Simplex Single Pair or RS-232 TXD 2400 or 9600 Baud (selectable via DIP switches)
Compliance	CE, British Standard BS EN 15317:2013 (specification for the characterisation and verification of ultrasonic thickness measuring equipment)
Environmental	RoHS, WEEE compliant
Warranty	3 years on gauge and 6 months on probe



Cygnus Mini ROV Mountable



The Cygnus Mini ROV Mountable thickness gauge has been specially designed to be mounted onto small observation ROVs with or without a manipulator facility. Built in conjunction with VideoRay, this mountable subsea thickness gauge will allow the operator to carry out an ultrasonic thickness measurement in areas that have previously been infeasible using larger ROVs or divers. This Multiple-Echo thickness gauge measures metal thickness and corrosion without removing protective coatings.

Key Features:

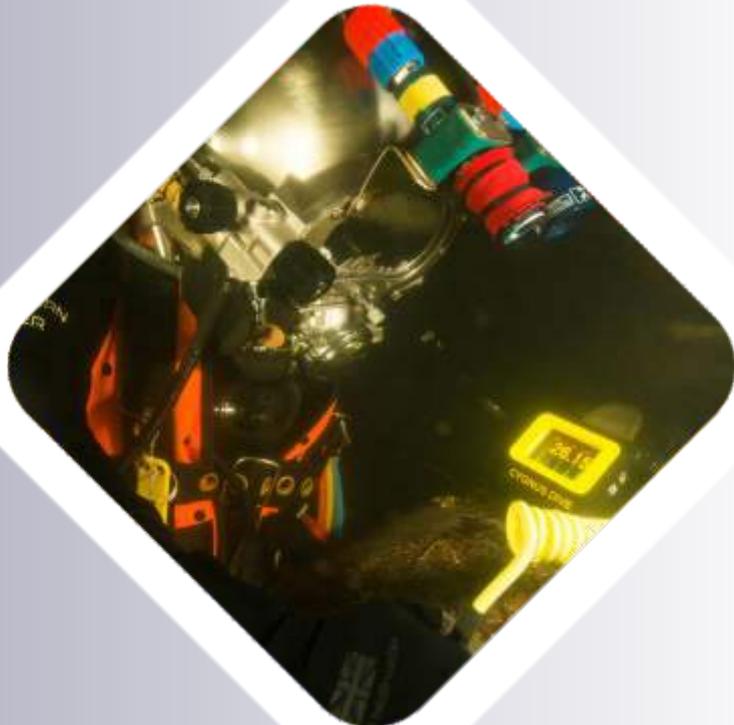
- Designed specifically to mount onto small observation ROVs.
- Supplied with CygLink software to display and log thickness measurements from the ROV on a computer at the surface which can be saved to a file and presented as a report.
- The Cygnus Topside Repeater (TSR) is available as an option and has the facility to display the thickness measurements remotely and overlay them on to a video signal. This allows the measurements to be superimposed on the ROV camera's monitor screen.
- Easy calibration at the surface via CygLink software or Top Side Repeater (TSR) unit.
- Optional dedicated probe holder to allow measurements on curved or flat surfaces.
- Thickness measurements are sent to the surface via RS-422 serial link (RS-232 on request).

Pressure Rated to 500 m Depth Multiple-Echo Ultrasonic Thickness Gauge

Materials	Sound velocities between 1000 m/s and 9995 m/s
Measurement Range in Steel	3 mm - 250 mm (0.110" - 9.994") with 2.25 MHz probe 2 mm - 150 mm (0.065" - 6.000") with 3.5 MHz probe 1 mm - 50 mm (0.045" - 4.000") with 5.0 MHz probe
Accuracy	±0.1 mm (±0.004") or 0.1% of thickness measurement, whichever is greatest, when calibrated in accordance with Cygnus Instruments calibration procedure
Resolution	0.05 mm (0.002")
Probes	Single crystal soft-faced compression 13 mm (½") - 2.25, 3.5 or 5 MHz (lower frequency probes offer better penetration on heavy corrosion/coatings)
Power	7.0 - 30 V dc @ 150 mA (max)
Display	PC or laptop with VGA (not included)
Size	160 mm x 62 mm (6.299" x 2.441")
Weight in Air	550 g (19.4 oz)
Operating Temp.	-10°C to +50°C (14°F to 122°F)
Approvals	RINA Type approved
Testing	Tested to 500 m (1,500 ft) depth
Communication	RS-422, Simplex Single Pair or 2400 Baud (RS-232 9600 Baud output available as special order)
Compliance	CE, British Standard BS EN 15317:2013 (specification for the characterisation and verification of ultrasonic thickness measuring equipment)
Environmental	RoHS, WEEE compliant
Warranty	3 years on gauge and 6 months on probe



Cygnus DIVE



The Cygnus DIVE is a wrist-mountable, simple to operate subsea ultrasonic thickness gauge. This very robust unit provides an invaluable free hand while performing remaining metal thickness measurements.

The large display is easily viewable by both the diver and his camera - even in the poorest visibility. The unit has only two buttons for easy navigation of an intuitive, clear menu.

Key Features:

- Wrist-mountable giving the diver a free hand
- Large colour display, clearly viewable by diver and camera in poor visibility
- A-scan display to assist with measurement verification
- Single-Echo and Echo-Echo modes
- Error-checked Multiple-Echo measurements to ensure genuine, verified measurements are displayed
- Data logging with auto-log feature; no button to press
- Stores up to 5,000 measurements and their A-scans
- Deep-Coat mode to measure through coatings up to 20 mm thick
- Probes are connected to the DIVE with a coiled double jacket cable which will extend up to 1 metre
- Pressure tested to 300 metres
- Rechargeable lithium-ion battery giving up to 11 hours continuous operation.

Divers Wrist-Mountable Thickness Gauge with a Large AMOLED Display

Display	2.8" quarter VGA colour AMOLED (320 x 240 pixels). Large clear thickness measurement (15 mm high numbers), viewable from all angles. A-scan display with automatic X axis. Battery level, signal strength, probe type, velocity. Measurement mode and units indication.		
Battery	Single 3.6V Li-ion 8.2 W battery. 11 hours continuous measurement. Low battery warning 'alert' message		
Measurements Modes	Multiple-Echo (three back-wall echoes) using single crystal (zero-degree) probes - automatically ignores surface coatings and measures only metal thickness Single-Echo (first back-wall echo) using twin crystal probes Echo-Echo (2 back-wall echos) using twin crystal probe		
Deep Coat	In Multiple-Echo mode, allows measurement to be made through thicker coatings of suitable materials of up to 20 mm thick		
Accuracy	±0.1 mm or 0.1% of thickness measurement, whichever is greatest, when calibrated in accordance with Cygnus Instruments calibration procedure		
Probes	Single crystal probes: • 13 mm - 2.25 MHz (S2C (standard)) • 19 mm - 2.25 MHz (S2D) • 13 mm - 3.5 MHz (S3C) • 6 mm - 5.0 MHz (S5C)	Twin crystal probes: • 13 mm - 2.0 MHz (T2C (for cast iron etc.)) • 8 mm - 5.0 MHz (T5B (standard))	
Probe Cables	Double outer jacket in tough PU. Coloured yellow for easy locations underwater. Coiled for ease of use. Fischer S105 series connectors.		
Measurement Ranges	Single crystal probes: • 3 - 250 mm with 2.25 MHz • 2 - 150 mm with 3.5 MHz • 1 - 50 mm with 5 MHz	Twin crystal probes in Single-Echo: • 2 - 100 mm with 5 MHz • 3 - 150 mm with 2 MHz	Twin crystal probes in Echo-Echo: • 4 - 50 mm with 5 MHz • 6 - 50 mm with 2 MHz
Measurement Resolution	Multiple-Echo with single crystal probes - 0.1 or 0.05 mm Single-Echo and Echo-Echo with twin crystal probes - 0.1 or 0.01 mm		
Measurement Units	mm or inches		
Probe Zero	Fully automatic probe zeroing for all probes types		
V-Path Correction	Automatic V-Path correction for all twin crystal probes		
Velocity Range	2000 to 9000 m/s in 1 m/s setps		
Pulser	Twin channel 70 V spike pulser		
Receiver / Amplifier	10 MHz bandwidth, 120 dB range, automatic TCG. 60 MHz measurement time-base		
Data Logging	One-handed automatic logging of stable measurements. Capacity for up to 5000 points including 640 point A-scan data		
Data Output	RS-485 single pair, half duplex for surface connection		
Computer Software	CygLink allows remote logging and viewing of A-scan graphs. Survey and report generation to PDF file. Graphic analysis of data and statistical calculations. Designed for Windows 7 and Windows 8		
Compliance	CE, British Standard BS EN 15317:2013 (specification for the characterisation and verification of ultrasonic thickness measuring equipment)		
Warranty	3 years on gauge and 6 months on probe		



Cygnus Underwater



The Cygnus Underwater is the original diver held subsea Multiple-Echo ultrasonic thickness gauge. It was designed for use by divers undertaking subsea maintenance and surveys 3 decades ago... and today it is still an industry standard.

Key Features:

- RINA approved (Certificate No. 2009DGPO787)
- Auto-Probe Recognition (APR)
- "Deep-Coat" mode for measuring through coatings up to 20 mm (3/4") thick
- Easy calibration using convenient buttons
- Rugged, durable, shock-proof construction
- Stable calibration - linear accuracy - no zero adjustment
- Large bright LED display for poor visibility
- Pressure rated to 300 m (1,000 ft) depth
- Heavy duty sealed unit with double 'O' ring protection
- Self verification of measurements to ensure accuracy
- Echo strength indicator to aid measurement
- All probes are protected by a membrane to prevent damage
- Various probe options
- Two rechargeable battery packs with charger
- Fixed head probe option for single handed use.

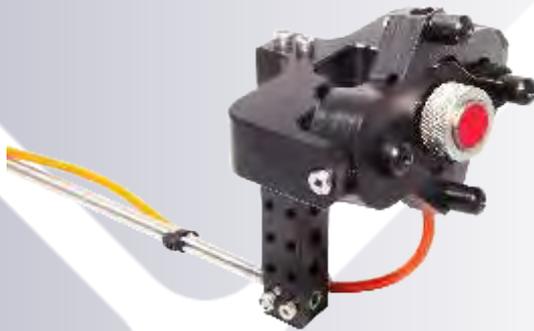
Cygnus' Original Diver-Held Multiple-Echo Underwater Thickness Gauge

Materials	Sound velocities between 2000 m/s and 7000 m/s (0.059 and 0.31 in/microsec) - covers virtually all common engineering materials
Measurement Range in Steel	3 mm - 250 mm (0.110" - 9.995") with 2.25 MHz probe 2 mm - 150 mm (0.065" - 6.000") with 3.5 MHz probe 1 mm - 50 mm (0.045" - 4.000") with 5.0 MHz probe
Accuracy	0.1 mm (0.005") when calibrated in accordance with Cygnus Instruments calibration procedure
Resolution	0.1 mm or 0.05 mm (selectable) (0.005" or 0.002")
Probes	Remote single crystal soft-faced compression 6 mm (1/4") - 5 MHz 13 mm (1/2") - 2.25, 3.5 or 5 MHz 19 mm (3/4") - 2.25 MHz (lower frequency probes offer better penetration on heavy corrosion/coatings)
Power	NiMH rechargeable battery pack
Battery Life	30 hours' (continuous measuring)
Display	Large, bright LED display
Size	235 mm x 75 mm (8 3/8" x 3")
Weight	950 g (2.1 lbs) - with remote probe 860 g (30.3 oz) - with fixed head probe
Operating Temp.	-10°C to +50°C (14°F to 122°F)
Environmental Protection	IPX8 continuous 300 m (984 ft) rating
Compliance	CE, British Standard BS EN 15317:2007 (specification for the characterisation and verification of ultrasonic thickness measuring equipment)
Environmental	RoHS, WEEE compliant
Warranty	3 years on gauge and 6 months on probe



Cygnus Probe Handlers

Options & Accessories



Cygnus G1 Probe Handler

Cygnus G1 Probe Handler For Observation, Inspection & Light Work-Class ROV

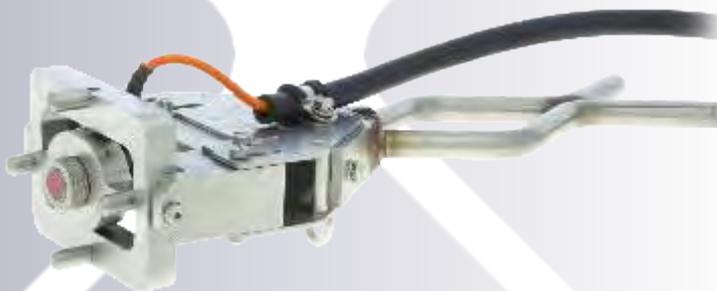
The Cygnus G1 probe handler is designed for use on observation, inspection and light work-class ROVs. Constructed from acetal, it is both strong and lightweight. It features an adjustable mounting bracket allowing optimum positioning of the UT probe. The UT probe is located in an articulated mount that allows up to 15 degrees of movement in both planes allowing automatic alignment of the probe face to the measurement surface making the ROV pilot's job easier.



Cygnus S1 Probe Handler

Cygnus S1 Probe Handler For ROV Ship Hull Inspection

The Cygnus S1 probe handler is designed for performing UT thickness surveys on ships' hulls with an observation or light work-class ROV. On contact with the hull plate, two sets of magnets first grip the steel, then as the ROV pushes forward the UT probe is allowed to tilt to align it to the hull surface placing the UT probe in the optimal position for measurement. The ROV pilot then just maintains gentle forward thrust while the measurement is taken. The S1 probe holder is constructed from acetal with stainless steel fixings keeping the overall weight down.



Cygnus W1 Probe Handler

Cygnus W1 Probe Handler For Work-Class ROV

The Cygnus W1 probe handler is designed for use on work-class ROVs. It can be held by a manipulator arm and supplied with either T bar or Fish Tail handles. It is constructed from 316 stainless steel throughout. Ultrasonic probe alignment is provided by a double jointed coupling that provides 15 degrees of movement in both planes guided by four pins. A shock absorbing spring reduces any impact loading on the unit. The design allows the manipulator arm to present the ultrasonic probe to the surface to be measured; any misalignment will be taken up by the coupling resulting in less movement of the manipulator arm position.

Topside Repeater Remote Display Unit

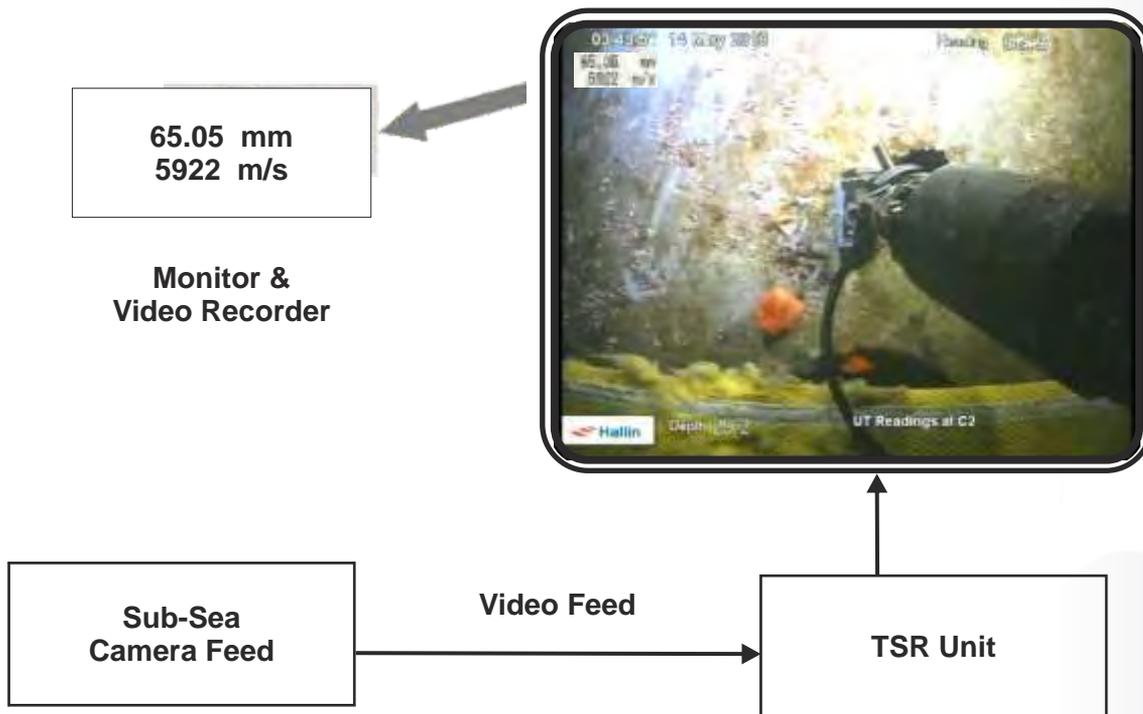
The Cygnus Topside Repeater is a remote display unit available as an option for the subsea range.

It displays the thickness measurements at the surface in real-time during the survey.



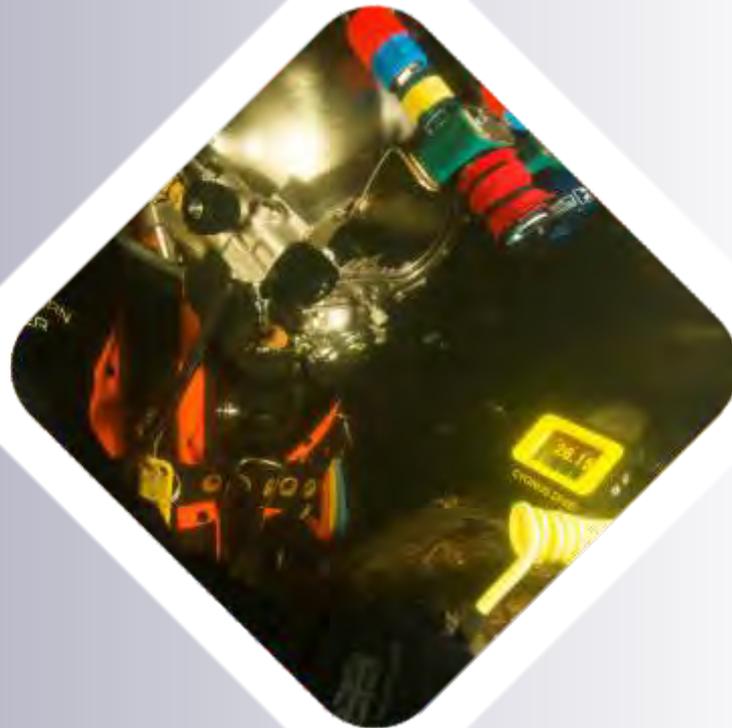
Topside Repeater with Video Overlay

The Topside Repeater can also overlay the real-time thickness measurements on to a composite video signal, superimposing it on the survey camera's monitor screen. It will also then be recorded if there is a video of the survey, showing exact locations and their thickness measurement for future reference.



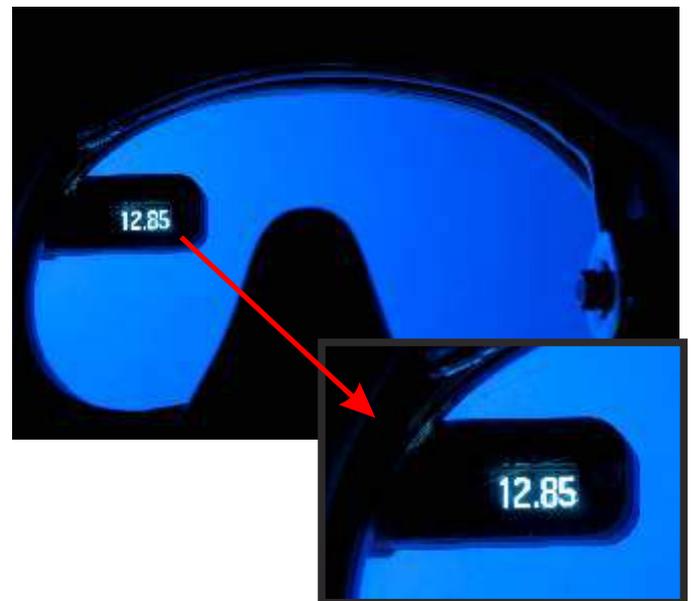
Cygnus HelmetView™

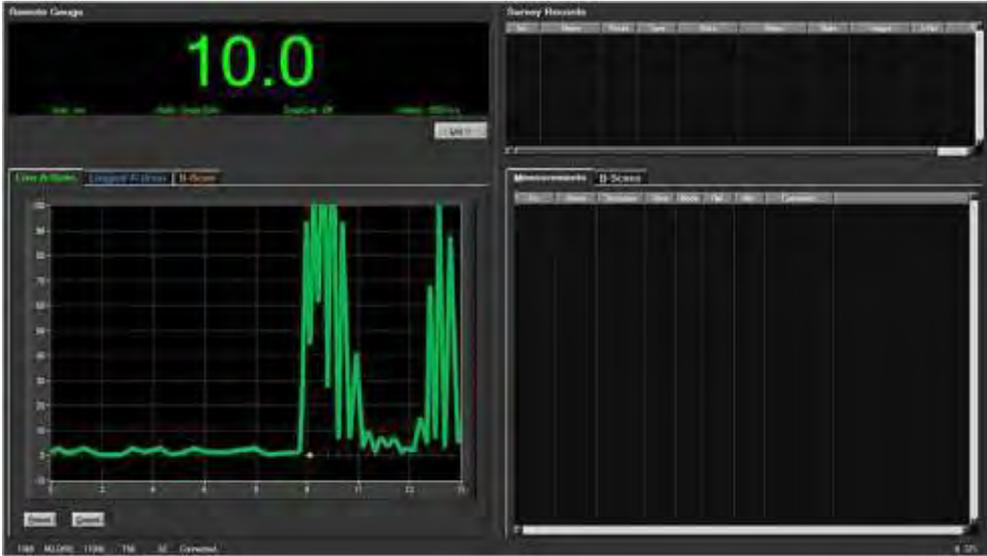
Options & Accessories



The Cygnus HelmetView™ is an accessory for the Cygnus DIVE gauge. This is a remote display with a fixing bracket for Kirby Morgan® helmets that have an accessory mounting point.

This is designed for use in situations with extremely poor visibility and ease of viewing by the diver:

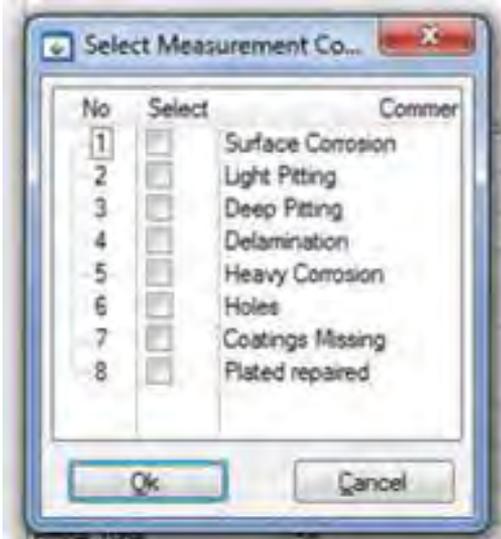
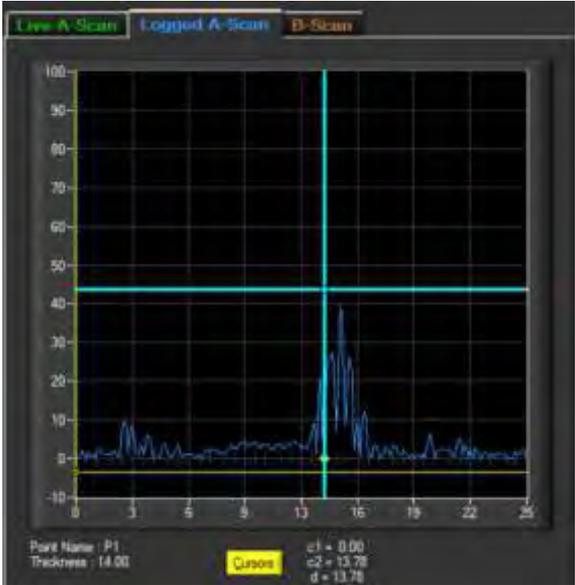




CygLink is a Windows® application for PCs and laptops running Windows 7® and above. It is used for uploading data from a data logging gauge in order to conduct analysis and reporting. When used with a Cygnus DIVE gauge and an umbilical cable, CygLink will display thickness measurements and A-scans at the surface.

In addition, measurements can be logged and gauge settings can be adjusted (including velocity of sound) with this simple to use application.

When CygLink is used to data log measurements, they can be recorded in a Linear List or a Two-Dimensional Grid.



A-scans can be analysed in CygLink

Each recorded measurement can have up to 8 pre-set comments added to it



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