

The CM2 Sidescan Sonar System

Versatile, Rugged, and Dependable - The **complete** sidescan survey system

SOFT TOW CABLES

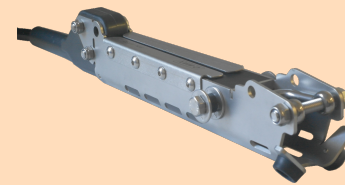
Coaxial hand-hauled cable for shallow water surveys.



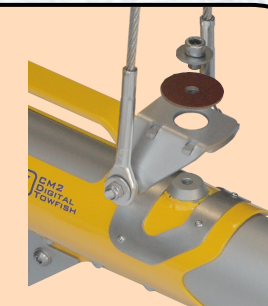
A storage reel, with or without internal slip rings, keeps things tidy.

The CM2 product family comprises the CM2 digital towfish, STR topside transceiver unit, MaxView acquisition software and a choice of kevlar or stainless steel armoured tow cables. A wide range of accessories is available.

The ergonomic tow cable terminator aids launch and recovery.



The towfish includes a tumble-free mechanism to help prevent loss. If the towfish becomes obstructed it uses a frangible disk that breaks when the cable tension exceeds a preset limit. This action transfers the cable tension to the rear of the fish, helping it to tumble clear of the obstruction.



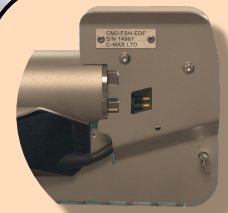
SONAR TRANSCIVER



The compact, rugged, splashproof topside unit offers a plug-and-play USB connection to MaxView or third party acquisition software. AC/DC power supply,



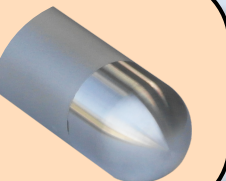
The C-Shell provides the STR with a waterproof case, complete with MIL-SPEC connectors and optional internal GPS receiver.



The tow cable connection is protected between the rear fins.

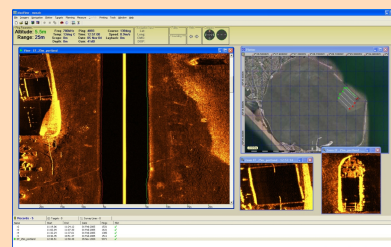
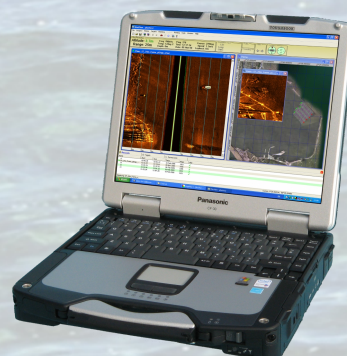


Corrosion resistant 316 stainless steel construction provides durability and a 2000m depth rating.



MAXVIEW ACQUISITION SOFTWARE

MaxView is designed to work with the CM2 and offers a wide range of online and offline features including acquisition and playback, survey planning, navigation and target marking.



A versatile plotter shows swept coverage, survey planning, targets and chart imagery.

An integrated echo sounder ensures accurate, automatic bottom tracking.

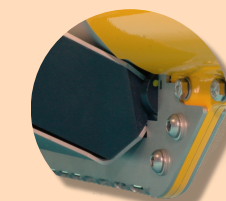
The optional heading, pitch and roll sensor provides towfish attitude information.

CM2 Digital CHIRP Towfish

DF { 100kHz - 500m/side
Option { 325kHz - 200m/side } EDF
780kHz - 50m/side } Option

18kg (40lbs) in air, 11kg (25lbs) in water

No tools are needed to change the angle of the transducers.



COMPACT POWER WINCH WITH 300M CABLE



The internal automatic overload clutch ensures that the cable and winch are not overstressed.



The winch includes motor temperature protection and an emergency stop switch. Electronic "soft start" current-limiting minimizes the surge current when accelerating.

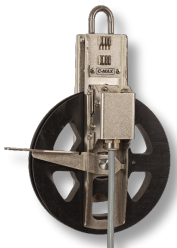


The winch remote pendant allows the sonar operator direct control of the tow cable scope - no need to pass movement commands to a deckhand.

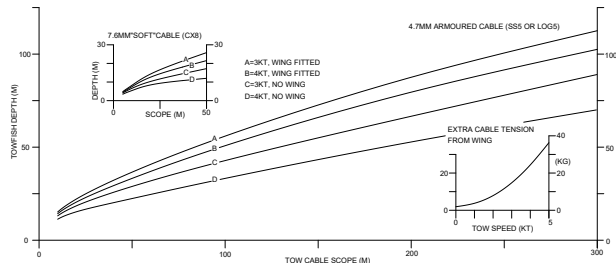
C-MAX

www.cmaxsonar.com

Accessories



16cm and 32cm pulleys are specially designed to allow easy loading of the tow cable. With the optional sensor as shown each unit becomes a counting pulley, displaying the outboard cable length on the sonar screen.



The optional wing depressor pulls the towfish up to 50% deeper. Unlike other depressors the high aspect-ratio wing, with built-in handles, makes for easy launch and recovery. It weighs only 5kg but provides 35kg of downforce at 5 knots.

The USBL transponder bracket suits a wide variety of beacons, holding the transponder at the optimum angle.



The polemount bracket allows the towfish to be fixed alongside the survey boat where this is preferable to towing the fish. The bracket suits standard 2" or 50mm poles.



Transit cases with internal fittings protect the towfish, winch and wing.

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For other regions please refer to our website www.cmasonar.com

SIDESCAN SONAR



C-MAX

CM2 SIDESCAN SONAR TRANSCIVER (STR) SPECIFICATION

Issue 5, February '10

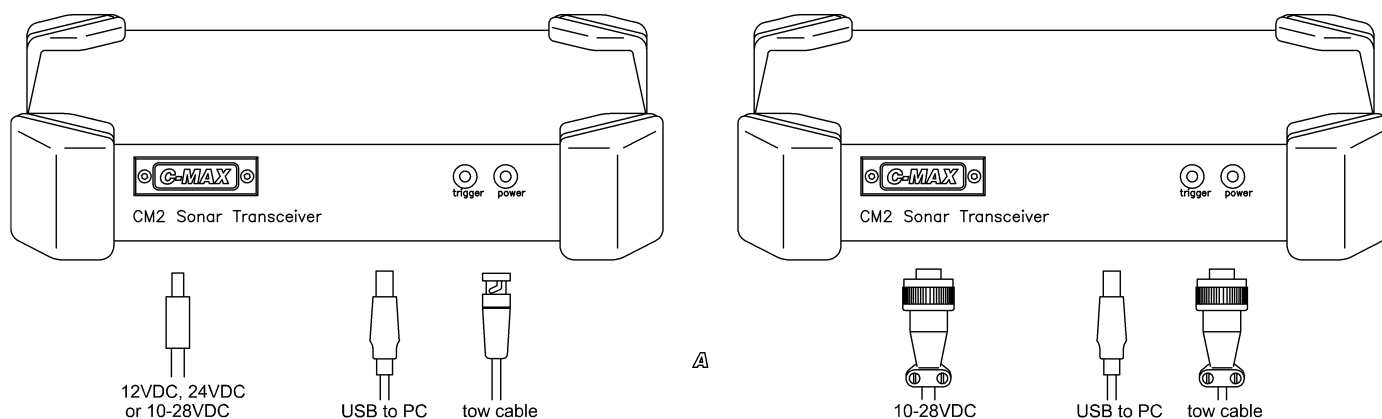
1. GENERAL

The C-MAX CM2 Sonar Transceiver Unit (STR) allows the CM2 digital towfish and digital tow cable telemetry to be interfaced to any host PC running MaxView sonar data acquisition software or acquisition software from third-party suppliers. The sonar appears to the host PC simply as a USB peripheral; the USB link combining sonar data, status and control. The advantages of the USB interface are that the data remains digital throughout and that no extra hardware is needed to interface to any computer, including laptops.



As well as transmitting the sonar data and status to the host PC, the STR also supplies power and control commands to the towfish. Power is not extracted from the USB link.

The standard interface uses a 2.5mm DC power socket and a BNC connector for the tow cable. The optional interface uses MIL-C-5015 for compatibility with the CM2 C-Shell waterproof enclosure.



2. INTERFACES

Tow cable

USB (slave, peripheral to acquisition computer)

3. DATA HANDLING, COMMANDS AND STATUS MESSAGES

Consult C-MAX for detail of the handling of the digitized echo signal, and the commands and status messages between the STR and the towfish. A DLL is available for developers of third-party interfaces.

4. PANEL DISPLAY

The STR is fitted with a red Power LED and a green Trigger LED. The trigger LED flashes at the ping rate.

5. POWER

Power input; 12VDC at 3A peak, or optionally specified to accept 24VDC at 1.8A peak. Later units accept 10 - 28VDC if so marked on the rear panel.

An auto-ranging external power adaptor is also supplied so that the STR may be powered from any 110/230VAC supply.

6. MECHANICAL

The STR is protected by a robust stainless steel splashproof enclosure (297 x 204 x 60mm), with rubber corners.

7. ENVIRONMENT

0 to +45°C; 10 to 90% RH; 40G, operating
-10 to +55°C; 2 to 95% RH; 40G, non-operating
IP64

The above specifications may be changed without notice.

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CM2 SIDESCAN SONAR, TOWFISH SPECIFICATION

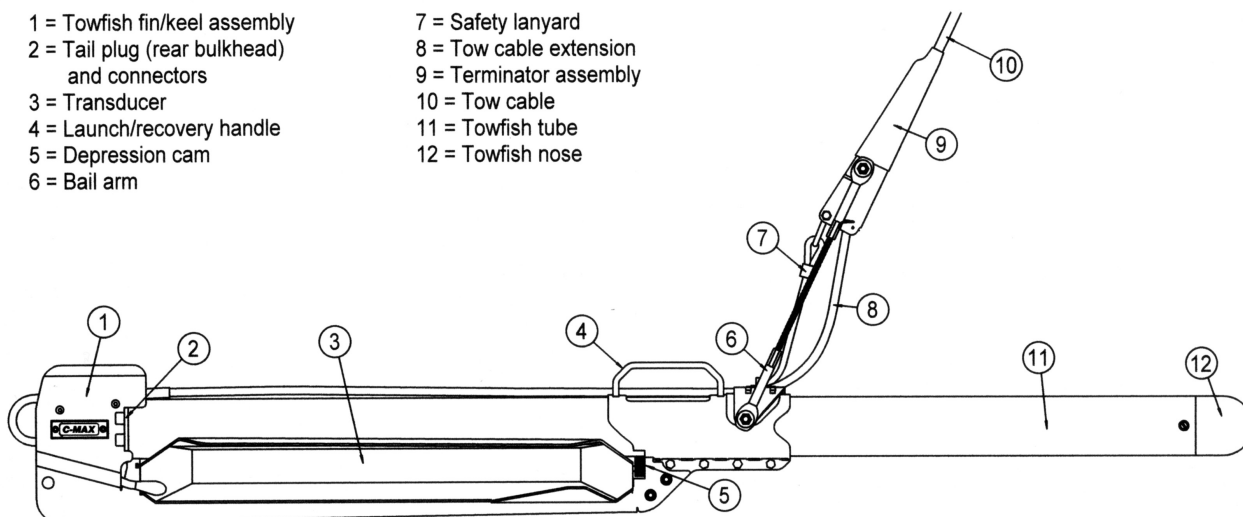
Issue 10, October '15

1. GENERAL

The CM2 digital towfish is the instrument that acquires the data from which the sonar image is derived. It is towed, and provided with power and digital telemetry services, by a reinforced or armoured 2-conductor tow cable. CM2 towfish are available in two different dual-frequency versions, both inter-operable with all CM2 data acquisition subsystems. A DeepTow version is also available (see CM2 DeepTow Specification).



- | | |
|--|-------------------------|
| 1 = Towfish fin/keel assembly | 7 = Safety lanyard |
| 2 = Tail plug (rear bulkhead) and connectors | 8 = Tow cable extension |
| 3 = Transducer | 9 = Terminator assembly |
| 4 = Launch/recovery handle | 10 = Tow cable |
| 5 = Depression cam | 11 = Towfish tube |
| 6 = Bail arm | 12 = Towfish nose |



2. ACOUSTICS

Acoustic frequencies

DF type: 100/325kHz dual frequency (CHIRP)

EDF type: 325/780kHz dual frequency (CHIRP)

Ranges (left and right)

100m, 200m, 300m, 400m, 500m at 100kHz

25m, 50m, 75m, 100m, 150m at 325kHz

12.5m, 25m, 37.5m, 50m at 780kHz

Acoustic pulse rates, pings per second (at range)

780kHz: 25.4(12.5m); 25.4(25m); 17.8(37.5m); 13.8(50m)

325kHz: 25.4(25m); 13.8(50m); 9.4(75m); 7.2(100m); 4.8(150m)

100kHz: 7.2(100m); 3.7(200m); 2.45(300m); 1.85(400m); 1.49(500m)

Array length and beamwidths (2-way 3dB points)

0.41m at 325kHz & 100kHz; 0.3m at 780kHz

horizontal 0.3° at 325kHz; 1.0° at 100kHz; 0.2° at 780kHz

vertical, full coverage -5° left through -90° to -5° right

Lateral resolution

18mm at 780kHz; 39mm at 325kHz (18mm at 25m range); 78mm at 100kHz

Specification

Beam depression (of maximum sensitivity axis)
10° or 20°, adjustable without tools

3. OTHER SENSORS

Towfish altitude, from integral echo sounder, 78mm resolution
Water temperature
Heading (option)
Depth (option)

4. MAGNETOMETER INTERFACE

Optional interface to Marine Magnetics Explorer and SeaSpy magnetometers, allowing the magnetometer towfish to be powered from the CM2 towfish and utilise the CM2 tow cable telemetry; this avoids the need for the magnetometer to use a separate tow cable.

5. WING DEPRESSOR

Optional CM2 Wing Depressor can be fitted to increase towing depth by up to 50% for the same cable length and towing speed.

6. SAFETY FEATURES

Breakaway mechanism, using standard C-MAX breakable washers, releases to give tail-first towing if tow force exceeds a nominal 0.75kN (75kg)

7. ENVIRONMENT

Operating depth
0-2000m
Operating speed
1-8 knots (but note that the physical limitations of cable drag and layback may limit operating speed)
Maximum towing speed
12 knots

8. MECHANICAL

Construction
stainless steel (no aluminium)
Towfish dimensions and weights
1.24m length
DF type: 18.0kg in air, 12.2kg in seawater
EDF type: 17.1kg in air, 11.3kg in seawater
Towfish temperature range
-10 to +45°C operating
-20 to +50°C non-operating

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CM2 PORTABLE WINCH SPECIFICATION

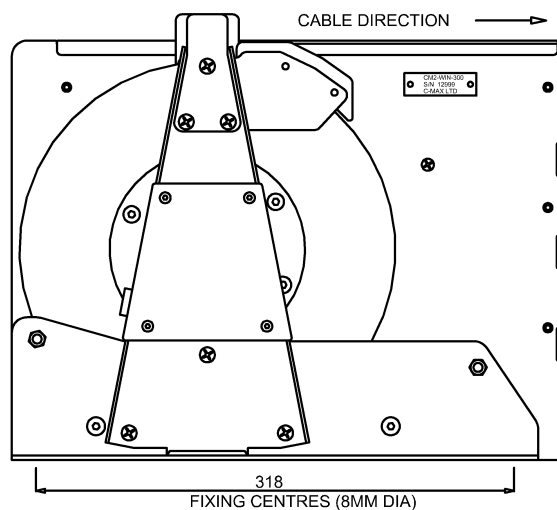
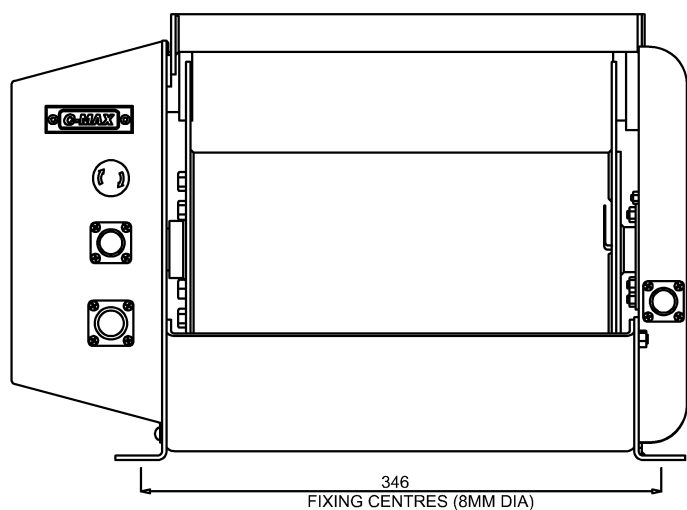
Issue 4, February '11

1. GENERAL

The CM2 portable winch was designed for use with the CM2 Sidescan Sonar system. It may also be used in other hydrographic applications.

It provides a means of handling the 4.7mm diameter armoured tow cable, suitable for deploying the CM2 towfish to depths in the range 2 - 100m, whilst remaining within a portable size and weight. The remote control pendant allows the sonar operator to control the tow cable whilst viewing the sonar display.

The CM2 winch features "soft start" for smooth acceleration, an automatic overload clutch, a temperature alarm and an emergency stop switch.



2. CAPABILITY

Cable capacity

300m of 4.7mm diameter armoured tow cable

Speed

0.8m/second at median diameter

Design tension range (heaving & veering)

15 - 40kgf at median diameter

3. SIGNAL PATH

2-channel slip ring

10m signal deck cable (other lengths optional)

4. REMOTE CONTROL PENDANT

Heave (in), Veer (out) buttons

10m control deck cable (other lengths optional)

5. POWER

24V DC, 30-40A heave, 14-16A veer

2m flying leads

6. MECHANICAL

Stainless steel construction

Worm drive (no brake)

"Soft start" acceleration

Automatic overload clutch (80kgf typical slip tension at median diameter)

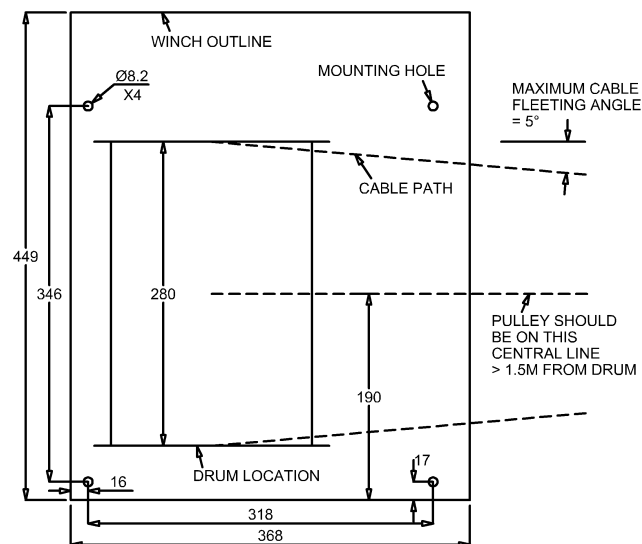
Motor overheat alarm

Emergency stop switch

Dimensions and weight

452mm x 350mm x 297mm (W x D x H); 20kg empty, 47kg with 300m cable

Mounting dimensions as shown below, plan view



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CM2 SIDESCAN SONAR, WING DEPRESSOR SPECIFICATION

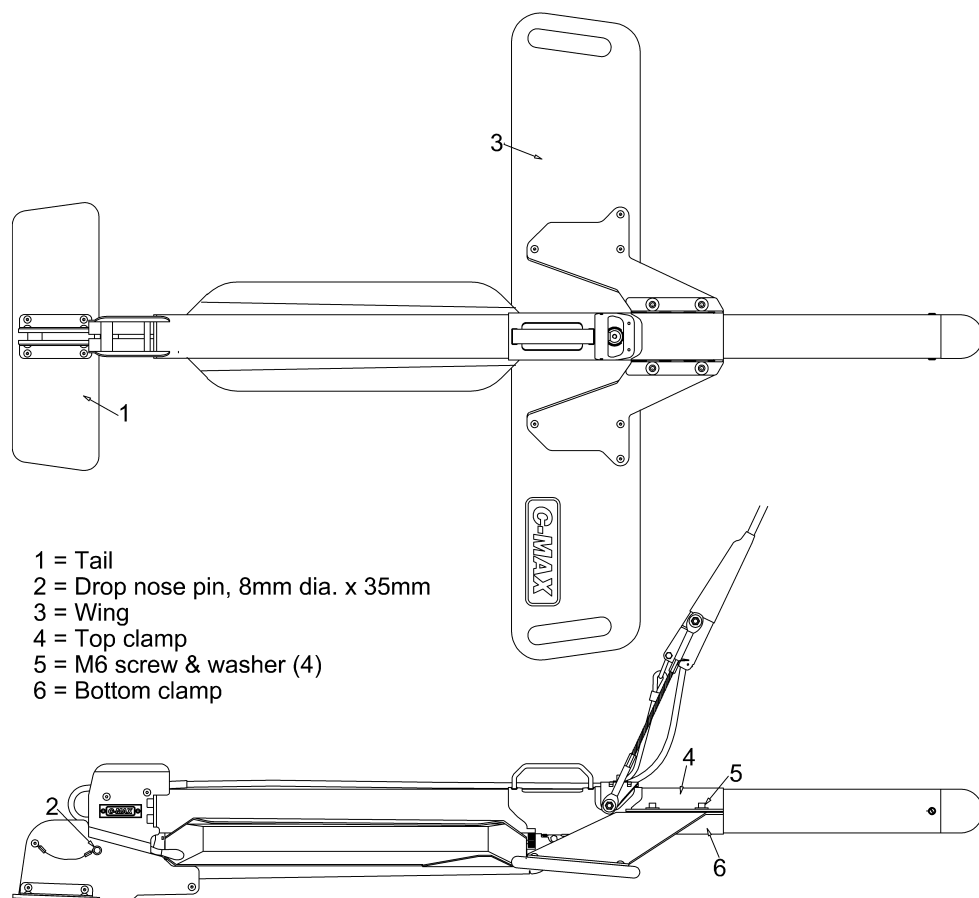
Issue 3, March '11

1. GENERAL

The CM2 wing depressor is designed to be easily attached and removed from a CM2 towfish . It increases the towfish depth for any specific tow cable length and tow speed. It consists of the wing and the tail unit, the wing providing hydrodynamic down force and the tail providing stability.



[Note: the design of the CM2 towfish allows a high-aspect-ratio wing to be positioned below the tow point without obstructing the acoustics. This wing and tail combination is significantly more efficient and stable than top-mounted delta-fin depressors.]



2. MECHANICAL

Construction

stainless steel and Nylon-66

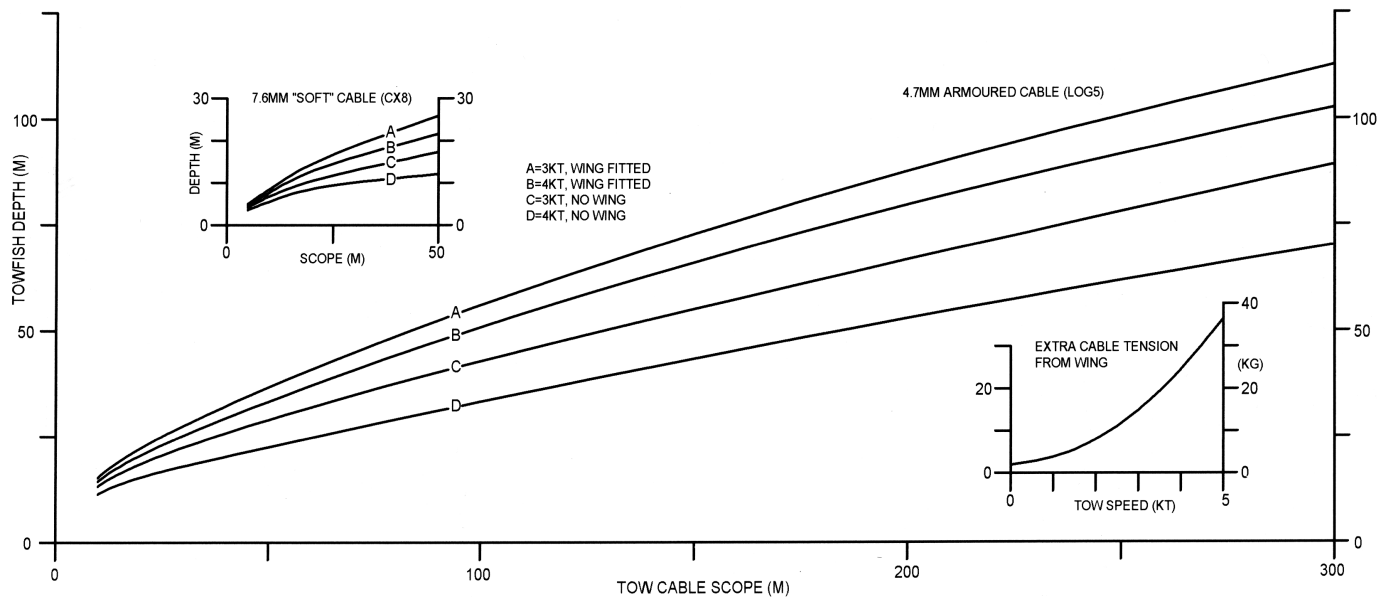
Wing span

0.892m

Weight (wing plus tail)

5.1kg in air, 2.0kg in water

3. PERFORMANCE



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CM2 SIDESCAN SONAR C-SHELL SPECIFICATION

Issue 1, April '08

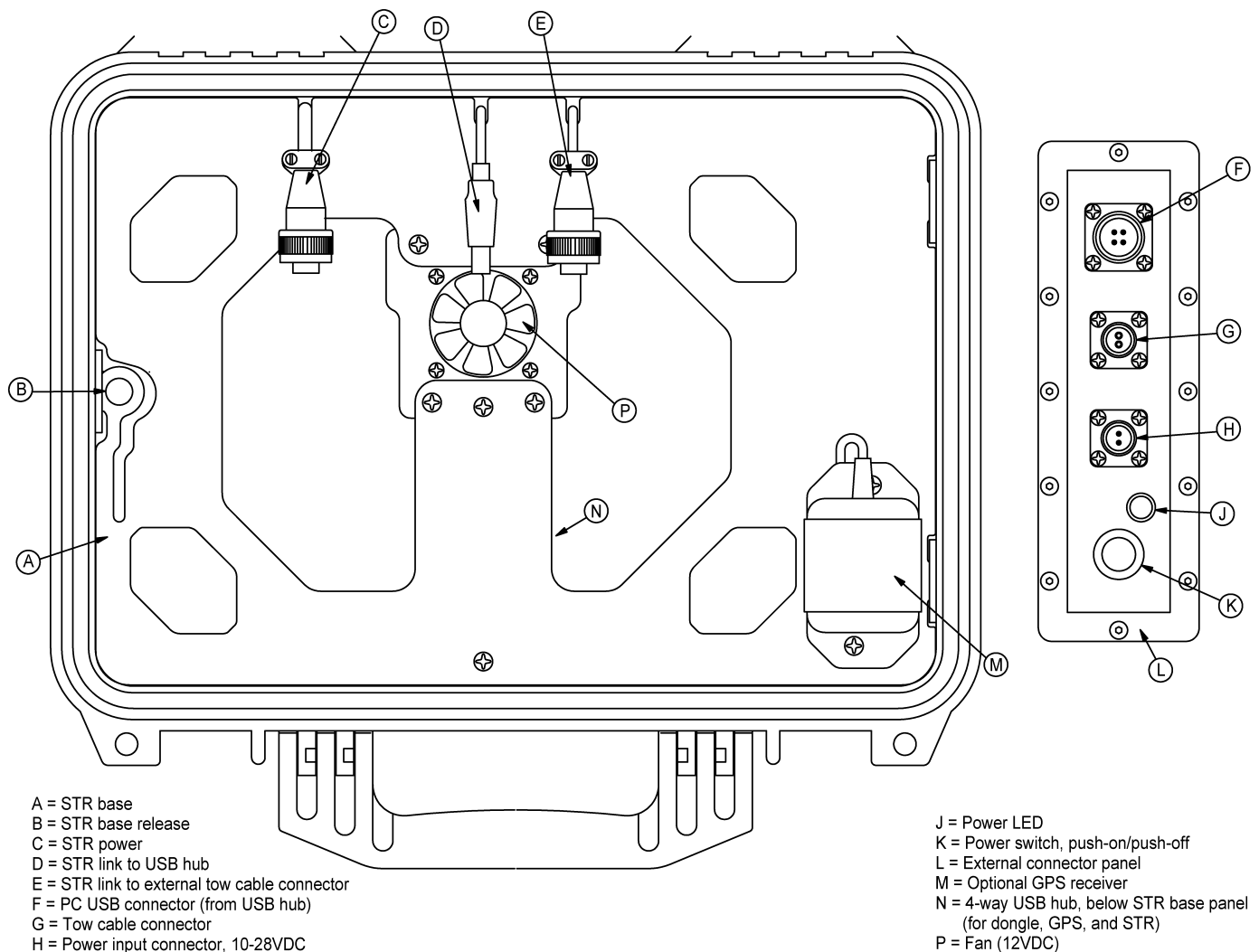
1. GENERAL

The CM2 C-Shell is a clamshell case that can be used as an optional waterproof (IP67) housing for the CM2 Sonar Transceiver (STR) whilst the STR is connected and operational. The C-Shell is fitted with internal connectors for the STR and waterproof (MIL-C-5015) external connectors for the tow cable, acquisition computer and DC power. The STR is secured to an internal mounting location, from which it can be easily removed and re-fitted as required.

The C-Shell has internal provision for a USB dongle (access key) for MaxView software, or for third-party software, running on the external acquisition computer. The C-Shell may also be specified with an internal GPS receiver. An internal USB hub combines the links from the STR, the dongle and the optional internal GPS receiver into a single USB link to the acquisition computer.

The external connector panel carries an on/off switch and power LED.

For the operation and other details of the STR refer to the latest issue of a separate document, CM2 SIDESCAN SONAR TRANSCIEVER (STR) SPECIFICATION.



2. INTERFACES

Tow cable
USB to acquisition computer
DC power (10-28V)
STR (internal)
Dongle (internal)
GPS receiver (internal)

3. MECHANICAL

The C-Shell uses a polypropylene clamshell enclosure, with O-ring seal, fitted with a stainless steel connector panel.
Dimensions: 41 x 33 x 18cm
Weight (with STR fitted): 6kg

4. ENVIRONMENT

0 to +45°C; IP67; 40G, operating
-10 to +55°C; IP67; 40G, non-operating

The above specifications may be changed without notice.

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