

## Specification

### CM2 SIDESCAN SONAR, TOWFISH SPECIFICATION

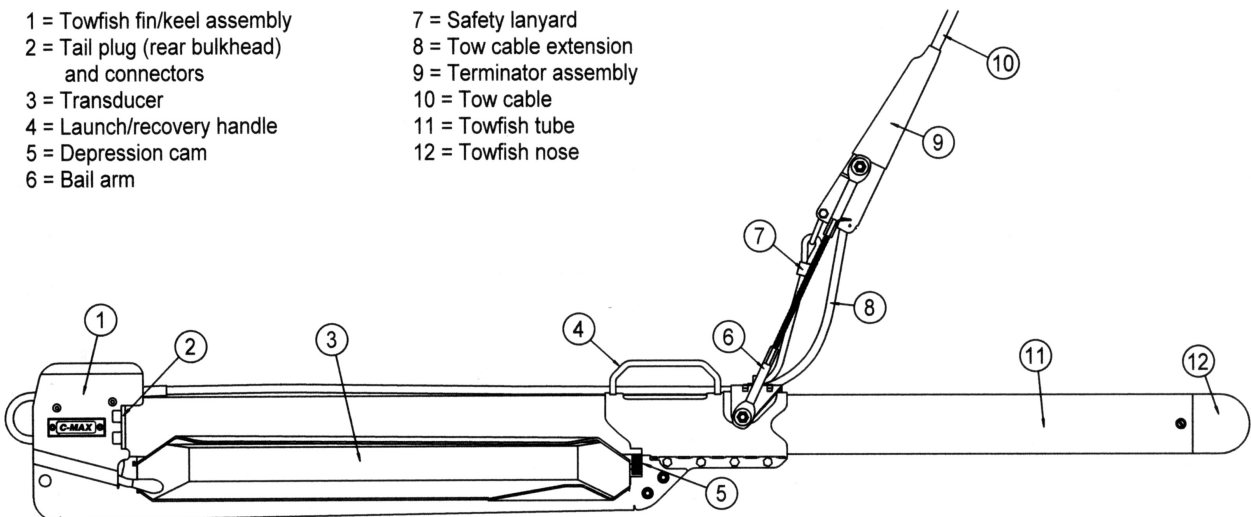
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#### 1. GENERAL

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).



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|--|-------------------------|
| 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

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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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