

## Specification

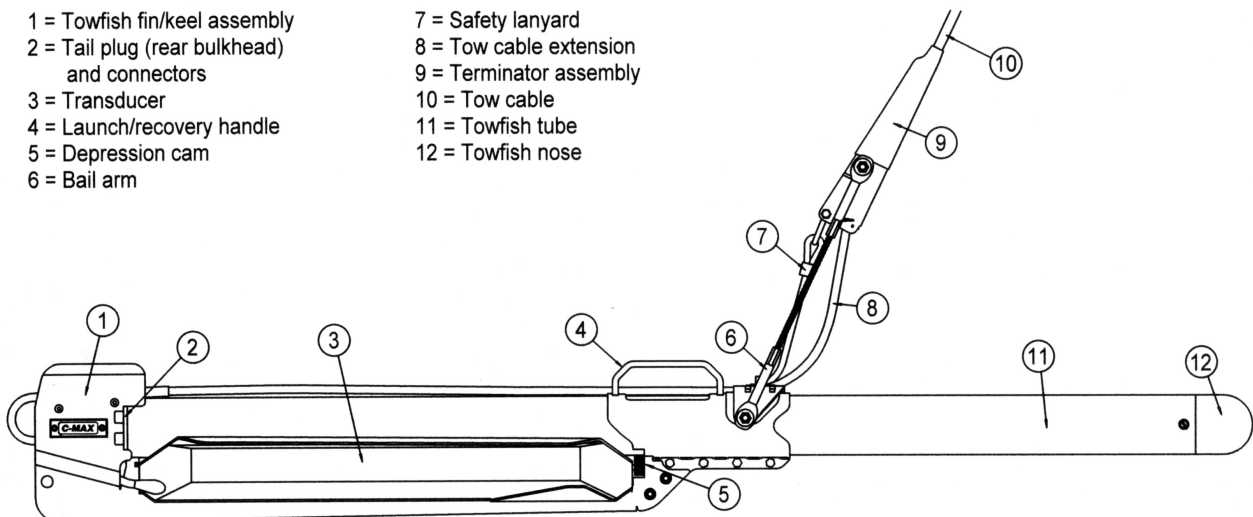
### CM2 SIDESCAN SONAR, TOWFISH SPECIFICATION Issue 8, March '11

#### 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 single- and dual-frequency versions, all interoperable 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

EDF type: 325/780kHz dual frequency

HF type: 325kHz-only

##### Ranges (port and starboard)

100m, 150m, 200m, 300m, 400m, 500m at 100kHz

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

12.5m, 25m, 37.5m at 780kHz

##### Acoustic pulse rates, pings per second (at range)

780kHz: 24.7(12.5m); 13.5(25m); 18.0(37.5m)

325kHz: 13.5(25m); 13.0(50m); 9.1(75m); 7.0(100m); 4.8(150m)

100kHz: 6.9(100m); 3.6(200m); 2.4(300m); 1.83(400m); 1.46(500m)

Pulse power and length

217dB re 1 micropascal @ 1m

range-dependent length, e.g. 53microseconds @ 50m

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

0.41m at 325kHz & 100kHz; 0.3m at 780kHz  
0.37° horizontal at 325kHz  
1.0° horizontal at 100kHz  
0.2° horizontal at 780kHz  
full coverage -10° left through -90° to -10° right

### Lateral resolution

39mm at 780kHz and 25m range at 325kHz, 78mm at 325kHz (not 25m range), 156mm at 100kHz

### 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. 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)

## 6. 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

## 7. MECHANICAL

### Construction

stainless steel (no aluminium)

### Towfish dimensions and weights

1.24m length

DF, LF and HF types: 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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