



# Towed Streamer Positioning System

## Performance Data

ION's towed streamer positioning system reduces the positional uncertainty for the entire towed streamer array by integrating horizontal and vertical streamer movements, acoustic ranges, headings, speed of sound and speed through water measurements under the command of the shipboard positioning controller.

The modular architecture allows for accurate, repeatable streamer positioning and flexible network configuration for reduced capital investment and lower cost of ownership.

- Combined compass heading and depth keeping functionality in CompassBird device
- Combined depth control and acoustic ranging functionality in AcousticBird device
- Combined lateral steering and acoustic ranging functionality in DigiFIN™ device
- DigiRANGE II™ acoustic technology for full acoustic cross-bracing capability
- Automatic and adjustable lateral, depth and acoustic ranging control algorithms
- Positioning controller integrated with Concept Systems Orca® host navigation system
- QuickCUFF™ compatible for rapid deployment and retrieval
- Compatible with ION FSK repeater technology for extended streamer deployments



## Specifications

ION

### Model 5011 Compass Bird



#### Physical Characteristics

Length	1.2 m (48.2 in)
Weight in air	8.32 kg (18.3 lbs)
Weight in water with batteries	2.78 kg (6.1 lbs)
Mounting	Industry-standard collars on 0.57 m (22.5 in) centers

#### Communications

Type	Serial, FSK
Frequency	26 kHz
Data rate	2,400 bit/s

#### Depth Measurement

Operating Range	0 m to 122 m (0 ft to 400 ft)
Resolution	0.15 m (0.5 ft)

#### Diving Plane

Lift	15.9 kg (35 lbs) @ 5 knots and 15° wing angle
Airfoil	NACA 651-012 airfoil section
Wing span	48.3 cm (19 in)

#### Battery

Cells	SLB 150 battery pack (standard) or 4, D-cell lithium batteries (optional)
Life	150 days (typical) (standard SLB 150 battery pack) 60 days (typical) (optional D-cell batteries)

#### Warranty

Limited Warranty Period	1 year
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### Model 5110 Acoustic Bird



#### Physical Characteristics

Length	1.2 m (48.2 in)
Weight in air	8.32 kg (18.3 lb)
Weight in sea water	2.78 kg (6.1 lb)
Mounting	Standard collars (QuickCUFF & QuickLatch Collars)

#### Communications

Type	Serial FSK
Frequency	26 kHz or 28 kHz
Data rate	2,400 bit/s

#### Depth Measurement

Operating Range	0 m to 122 m (0 ft to 400 ft)
Resolution	0.15 m (0.5 ft)

#### Acoustic Measurement

Accuracy	0.1 ms
Resolution	0.05 ms
Number of Ranges per Network	2,800 ranges per system
Number of Devices	1,200 DigiRANGE II acoustics and/or bird devices per vessel
Maximum Range	1,200 m
Ranges Received per Device	8
Acoustic Compatibility	DigiRANGE & DigiRANGE II acoustic technology

#### Diving Plane

Lift	15.9 kg @ 5 knots at 15° wing angle
Airfoil	NACA 651-012 Airfoil section
Wing Span	48.3 cm

#### Batteries

Cells	SLB-150 battery pack
Life	150 days

#### Warranty

Limited Warranty Period	1 year
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## Specifications

ION

### DigiRANGE II™

#### Acoustic Ranging System Buoy / Source / Hull Mount (CTX)



#### Electronics

Number of channels	3 optimizes per gun
Acoustic band	50 kHz - 100 kHz
Ranges per node	8

#### Power

Power options	Client-supplied 9-36 V DC Line power unit
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Product	Length	Diameter	Weight
Buoy mounted Electronic Module	83.8 cm (33 in)	8.3 cm (3.25 in)	5 kg (11lbs) in air
Remote Transducer Flanged	30.5 cm (120 in)	10.7 cm (4.2 in)	4.1 kg (9 lbs) in water
Remote Transducer Towed	98.4 cm (38.75 in)	15.2 cm (6 in)	25.9 kg (57 lbs) in water
Remote Transducer Right Angle	73.6 cm (29 in)	8.9 cm (3.5 in)	9.5 kg (21 lbs) in water
Remote Transducer Threaded	18.4 cm (7.25 in)	6.0 cm (2.38 in)	2.5 kg (5 lbs) in water

### DigiRANGE II™

#### Acoustic Ranging System Streamer Mount (CMX)



#### Electronics

Number of Channels	3 optimizes for Gun 16 optimizes for streamer
Acoustic Band	50 kHz – 100 kHz
Ranges per Node	8

#### Physical Characteristics

Battery Life	180 days for Lithium (standard); 65 days for Alkaline (optional)
Length	105.4 cm (41.5 in.)
Diameter	9.4 cm (3.7 in.)
Weight (in water)	2.4 kg (5.3 lb.)
Limited Warranty Period	1 year

### CTX and CMX System

Number of Nodes	600 acoustic devices per system
Instrument Accuracy	0.1 ms
Range Resolution	0.05 ms
Number of Ranges per Network	2,800 ranges per system (protocol-limited)
Host Interface Protocol	The Ethernet host protocols provide for multiple, variable-length packets with support for up to 2,800 ranges with status information. Also, ION supports the DigiCOURSE® standard and extended binary protocol in addition to other customer-defined protocols.

## Specifications

ION

### DigiFIN™



### Physical Characteristics

<b>Length</b>	1.3 m (52 in)
<b>Weight in air</b>	13.1 kg (29 lbs)
<b>Weight in sea</b>	Neutral
<b>Mounting</b>	Industry standard collars (QuickCUFF)

### Communications

<b>Type</b>	Serial FSK
<b>Frequency</b>	26 kHz
<b>Data rate</b>	2400 bit/s

### Depth Measurement

<b>Data</b>	0 m to 122 m (0 ft to 400 ft)
<b>Commands</b>	0.15 m

### Lateral Performance

<b>Streamer feathering correction for typical seismic surveys</b>	2° - 3°
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### Acoustic Measurement

<b>Accuracy</b>	0.1 ms
<b>Resolution</b>	0.05 ms
<b>Number of ranges per network</b>	2,800 ranges per system
<b>Number of devices per vessel</b>	1,200 DigiRANGE II acoustics and/or bird devices
<b>Maximum Range</b>	1,200
<b>Ranges received per device</b>	8
<b>Acoustic capability</b>	DigiRANGE II acoustic technology; Compatible with current CMX, CTX, and 5110 Acoustic Bird products.

### Battery

<b>Cells</b>	SLB-150 Battery Pack
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### QuickCUFF™



### Physical Characteristics

**Can be designed to fit any of the current marine seismic streamers**

QuickCUFF is the latest innovation in collar design developed by ION. The new titanium construction of the outer collar provides superior tensile strength than other collars used in the seismic industry today. QuickCUFF provides for the rapid attachment and detachment of DigiCOURSE® external devices on marine seismic streamers. Production test data analysis prove that QuickCUFF reduces the external device attachment and removal time by more than 2/3 thus increasing the vessel(s) productivity.

## Specifications

ION

### Model 7500 Speed Log



#### Physical Characteristics

Weight in air	8.32 kg (18.3 lb)
Weight in sea water with batteries	2.78 kg (6.1 lb)
Length	1.2 m (48.2 in)
Housing	Uni-body Platform, DigiCOURSE <sup>®</sup> 5000
Mounting	Industry standard collars on 0.57 m (22.5 in) centers
Operating Temperature	-2° to +40°C (+28F to +104°F)
Storage Temperature	-40°C to +70°C (-40°F to +158°F)
Maximum Tow Speed	10 knots
Maximum Pitch Angle	±5 degrees

#### Flow Speed

Measurement Range	1.5 to 10 knots
Resolution	0.01 knots
Accuracy (RMS)	±0.12 knots, for angle of < 3°
Survival Depth	200 m (656 ft)

#### System

Power	SLB-150 battery pack
Battery Life	180 days (typical) at 30 s sample rate
Calibration	2 years

### Model 7000 Streamer Mounted Velocimeter



#### Physical Characteristics

Weight in air	6.0 kg (13.2 lbs)
Weight in water	1.3 kg (2.9 lbs)
Length	1.47 m (58 in)
Housing	Uni-body Platform, DigiCOURSE <sup>®</sup> 5000
Mounting	Industry standard collars on 0.57 m (22.5 in) centers
Operating Temperature	-4°C to +40°C (+25°F to +104°F)

#### Flow Speed

Resolution	0.1 m/s
Accuracy (RMS)	0.5 m/s
Measurement Range	1400.0 m/s to 1550.0 m/s
Sample Rate	User-selectable; default is every 6 <sup>th</sup> shot interval

#### System

Power	4, D-cell, lithium batteries (standard) SLB 150 battery pack (optional)
Battery Life	100 days <sub>typ</sub> @ 60-s sample rate (standard D-cell batteries) 250 days <sub>typ</sub> @ 60-s sample rate (optional SLB 150 battery pack)
Limited Warranty Period	1 year; 2 years for velocimeter calibration

## Specifications

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### Handheld Mobile Computer



### Hardware

<b>Handheld Computer</b>	<p>Microsoft Windows for PocketPC</p> <p><u>Lithium-Ion Battery:</u> 8-10 hours battery life, and 4 hours recharging time.</p> <p><u>Industrial grade conduction:</u> Water resistance IPS4 complaint, 4 foot drop all edges, corners, and surfaces.</p>
<b>Wireless Access Point</b>	<p>IEEE 802.11b protocol / Wi-Fi compatible</p> <p><u>Coverage:</u> 50 x 50 m average coverage radius</p> <p><u>Cables:</u> Network uses UTP 3 cabling to RJ45 connector Regulated power, 120-240 V AC</p>
<b>RS232-FSK Modem Box</b>	<p>ION FSK communication protocol</p> <p>Frequency -1</p>

### PCS Positioning Control System



Physical Characteristics	DMU	LIU
<b>Width</b>	48.09 cm (18.95 in)	48.26 cm (19.00 in)
<b>Depth</b>	65.25 cm (25.69 in)	28.88 cm (11.4 in)
<b>Height</b>	8.8 cm (3.47 in)	13.26 cm (5.219 in)
Electrical Characteristics	DMU	LIU
<b>Input voltage</b>	100-240 Vac	100-240 Vac
<b>Input frequency</b>	50-60 Hz	50-60 Hz
<b>Input power</b>	300 W (max)	300 W (max)
<b>Output voltages</b>	+3.3 Vdc@20A +5 Vdc @35A -5 Vdc @ 0.5A +12 Vdc @ 16A -12 Vdc @ 1.0A	+3.3 Vdc@28A +5 Vdc @30A N/A +12 Vdc @15A -12 Vdc @ 0.8A

## Specifications

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### Model SLB-150 Battery Pack



#### Physical Characteristics

<b>Shell life</b>	De-rates 2% capacity per year @ +77° F
<b>Cell chemistry</b>	Lithium thionyl chloride
<b>Cathode type</b>	Liquid
<b>Cell count</b>	2 cells per bank; 2 banks per pack
<b>Capacity</b>	70 Ah per pack
<b>Safety</b>	3-A fuse Hermetic-cell construction Water resistant packaging
<b>Diameter</b>	4.67 cm (1.84 in)
<b>Length</b>	33.12 cm (13.04 in)
<b>Weight</b>	1.1 kg (2.42 lbs)

### Model CMX-150 Battery Pack



#### Physical Characteristics

<b>Shell life</b>	De-rates 2% capacity per year @ +77° F
<b>Cell chemistry</b>	Lithium thionyl chloride
<b>Cathode type</b>	Liquid
<b>Cell count</b>	9 cells
<b>Capacity</b>	1200 Wh
<b>Safety</b>	0.75-A, slo-blo fuse Hermetic-cell construction Water resistant packaging Polarity-reversal protection
<b>Diameter</b>	7.77 cm (3.06 in)
<b>Length</b>	30.16 cm (11.875 in)
<b>Weight</b>	3.175 kg (7.0 lbs)

**Order Information**

ION

**Shipboard Equipment****Mounted Hardware**

<b>Assembly PCS</b>	8000-1764
<b>Assembly PCS LIU 2-Channel</b>	8000-1765-2
<b>Assembly PCS LIU 8-Channel</b>	8000-1765-8
<b>PCS Installation Kit</b>	8200-206
<b>Line Power Unit CTX</b>	9000-503/01

**PCS Software Set**

<b>Hi-Resolution V6.0</b>	9000-507/HR-600
<b>2-Channel V6.0</b>	9000-507/2-600
<b>12-Channel V6.0</b>	9000-507/12-600
<b>16-Channel V6.0</b>	9000-507/16-600
<b>24-Channel V6.0</b>	9000-507/24-600
<b>32 Channel V6.0</b>	9000-507/32-600

**Spares Kit (New Install)**

<b>PCS 2-Channel</b>	8200-207-2
<b>PCS 8-Channel</b>	8200-207-8
<b>PCS Cards (for LIU)</b>	8200-205-c

**Manuals**

<b>Installation Guide PCS</b>	4200-504
<b>Manual User's PCS V6.0</b>	4200-036-600

**Replacement Kits / Ancillary Components**

<b>CTX Vessel Radio</b>	9000-4038
<b>Kit Installation Radio</b>	6500-075

**Back Deck Equipment**

<b>Final Assembly Mobile Handheld</b>	9000-295/01
<b>Assembly Handheld Mobile Computer</b>	8000-2295
<b>Assembly RS232 FSK Handheld</b>	8000-2296
<b>Assembly 710 series Handheld Accessories</b>	8000-2297
<b>Assembly Wireless Handheld Access Point</b>	8000-2298



## Order Information

ION

### In-water Depth and Lateral Control Equipment

#### 5000 Product Family

DigiBIRD Model 5010	9000-5010
DigiBIRD Model 5011 - Final Assembly	9000-5011
Compass Bird 5011E	9000-5011E
DigiFIN - Lateral Acoustic Bird	9000-5120
Acoustic Bird Model 5110	9000-5110

#### SLB Battery / Ancillary Components

Battery Pack Lithium SLB-150	4000-074
Tool SLB-150 Conditioning	7000-101
Battery Pack Test Adapter 5000	9000-4123

#### Tools

Kit Depth Calibration 115 VAC	6500-065/01
Kit Depth Calibration 220 VAC	6500-065/02
Tool Kit 5000	6500-042

#### Spares Kit (New Install)

Kit Spare Model 5000	6500-041
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#### Service / Outline Drawings

Service Diagram Model	0050-003
Outline Drawing 5000 Series	0050-017
Outline Drawing Acoustic Bird 5110	0050-218

#### Manuals

5000 Operations and Maintenance W/CD-R	4200-017-300
5000 Operations and Maintenance Electronic Copy (PDF)	4200-016 4200-016E

#### Video

VHS 500 Display Assembly USA	VT-001-NTSC
VHS 500 Display Assembly EUR	VT-001-PAL

#### Diagnostic Software

Bird check	TBD
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#### Replacement Kits / Ancillary Components

Replacement Kit - Forward End Cap	2500-K042
Replacement Kit - Front Locking Pin	2500-K963
Replacement Kit - Rear Locking Rod	2500-K508
Replacement Kit - Motor Module	8000-K720
Replacement Kit - Battery Module	8000-K724
Replacement Kit - Wing Module	8000-K726
Assembly Safety Lanyard	8000-627
Fix Pressure Fitting ¼-20	5400-092
Wing 5000 Series	2501-259

**Order Information**

ION

**In-water Acoustic Equipment (DigiRANGE II™ only)****4000 Product Family**

<b>CMX DigiRANGE II 26 kHz</b>	9000-4013/01
<b>CTX DigiRANGE II 26 kHz</b>	9000-4029/01
<b>CTX DigiRANGE II Radio</b>	9000-4029/10

**CMX SLB Battery / Ancillary Components**

<b>Battery Pack Lithium CMX</b>	4000-076
<b>Battery Pack Test Adapter CMX</b>	9000-4122
<b>Tool Fishing CMX Battery</b>	7000-098
<b>Tool Battery Conditioning CMX</b>	7000-103

**Spares Kit (New Install)**

<b>Kit Spares CMX</b>	6500-091
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**Service / Outline Drawings**

Outline Drawing CTX	0050-221
Outline Drawing CTX Radio	0050-226
Outline Drawing Acoustic Bird 5110	0050-218

**CTX Transducers (Pingers)**

<b>Flanged</b>	9000-4112/01
<b>Towed</b>	9000-4112/02
<b>Right Angle</b>	9000-4112/03
<b>Threaded</b>	9000-4112/04

**Diagnostic Software**

<b>Pod check</b>	TBD
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**Replacement Kits / Ancillary Components**

Replacement Kit - CTX DigiRANGE II Elec 26 kHz	8000-K663-11
Replacement Kit - CMX DigiRANGE II Nose	8000-K1233
Replacement Kit - CMX DigiRANGE II Rear latch	8000-K1262
Replacement Kit - Source Application	8200-037
Replacement Kit - Acoustic XDCR 90DG	8000-K386
Model 303 Floatation Tube	9000-303/01
CTX Remote Radio	9000-4037

**Order Information**

ION

**In-water Motion Sensor Equipment****Final Assembly**

<b>Velocimeter Final Assembly</b>	9000-7000
<b>Speed Log Final Assembly</b>	9000-7500

**Spares Kit**

<b>Velocimeter Spares Kit</b>	6500-085
<b>Speed Log Spares Kit</b>	6500-090

**Service / Outline Drawings**

<b>Velocimeter Service Diagram</b>	0050-222
<b>Speed Log Service Diagram</b>	0050-223
<b>Velocimeter Outline Drawing</b>	0050-191
<b>Speed Log Outline Drawing</b>	0050-212

**Manuals**

<b>Velocimeter Manual Model 7000</b>	4200-051
<b>Electronic Copy (PDF)</b>	4200-051E
<b>Speed Log Manual Model 7500</b>	4200-053
<b>Electronic Copy (PDF)</b>	4200-053E

**Ancillary Components**

<b>Anode Velocimeter Long Life</b>	2850-181
<b>Screw SHCS 8-32X1" 316 SS</b>	2800-865

**Battery**

<b>Devices use the same Battery and Tester as 5000 Products</b>	SEE IN-WATER DEPTH AND LATERAL CONTROL EQUIPMENT
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**Tools**

<b>Devices use the same Tools as 5000 Products</b>	SEE IN-WATER DEPTH AND LATERAL CONTROL EQUIPMENT
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