MODEL 863-000-200
DIGITAL ALTIMETER
USER'S MANUAL

330KHZ, 1000M DEPTH RATED
0.5 TO 100FT (0.15 TO 30M) OPERATING RANGE
SERIAL OUTPUT

DOCUMENT NO. 430-017C
April 14, 2005

S/N_____

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IMAGENEX MODEL 863
DIGITAL ALTIMETER

APPLICATIONS:

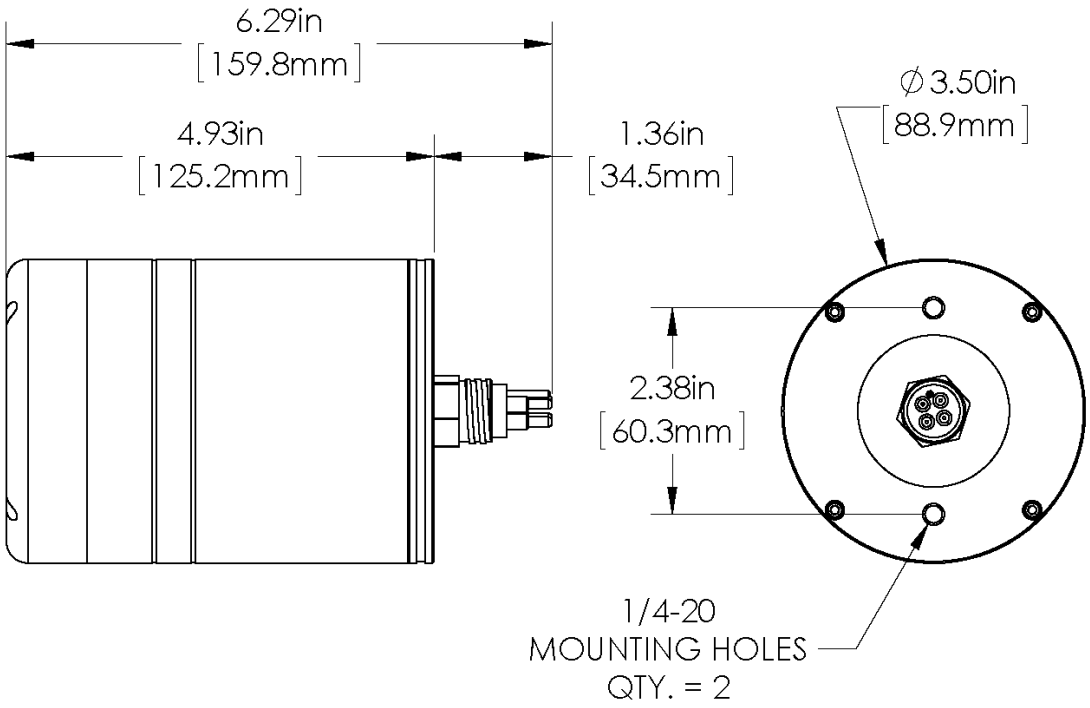
- Measure altitude of structures & objects
- Measure range to other structures & objects
- Monitor sedimentation or scouring
- ROV, AUV, & UUV

FEATURES:

- NMEA 0183 Serial Output
- Self contained
- Low power
- Compact size

The Imagenex Model 863 is a completely self-contained altimeter with a digital output. It is mounted in a pressure proof housing with an underwater connector for use at depth. The 863 Altimeter measures the range to the bottom or other large objects. It requires only power and an RS-232 or RS-485 serial interface to an external device.

HARDWARE SPECIFICATIONS:	
FREQUENCY	330 kHz
RANGE	0.6 m – 30 m (2’ – 100’)
TRANSDUCER	Conical beam
TRANSDUCER BEAM WIDTH	10°
TRANSMIT PULSE LENGTH	100 microseconds
RANGE RESOLUTION	20 mm
MIN. DETECTABLE RANGE	0.6 m (2’)
MAX. OPERATING DEPTH	1000 m (3000 m and 6000 m available)
INTERFACE	RS-232 @ 4800 bps (RS-485 optional)
CONNECTOR	Four conductor, wet mateable (Subconn MCBH4M-AS)
POWER SUPPLY	22 – 32 VDC at 100 mA max.
DIMENSIONS	89 mm (3.5”) diameter x 125 mm (4.93”) length
WEIGHT: In Air **In Water**	1000 m unit: 1.2 kg (2.6 lbs) 1000 m unit: TBA
MATERIALS	6061-T6 Aluminum & PVC
FINISH	Anodized



ORDERING INFORMATION:		
1000 m UNIT	Standard	863-000-200
3000 m UNIT	Standard	863-000-201
6000 m UNIT	Standard	863-000-202
RS-485	Option	-007

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1. SPECIFICATIONS

1.1 SYSTEM SPECIFICATIONS

1.1 IMAGENEX MODEL 863-000-200 ECHO SOUNDER MODULE

Operating Frequency:	330 KHZ
Transducer Beam Angle:	10 degree total included angle to 3db points
Transmit Pulse Length:	100 microseconds
Output:	Serial (RS-232 @ 4800,N,8,1) NMEA 0183 “$SDDBT” string
Range Resolution:	26.7 microsecond (2cm)
Overrange Output: No Return Output:	0 microseconds 0 microseconds
Power Supply:	20-36 VDC at 100 mA maximum
Connector:	Impulse MCBH-4-MP-SS (mates with MCIL-4-FS) 4 conductors, 2 for power, 2 for serial
Materials:	aluminum 6061-T6, 300 series stainless steel, pvc, acetal homopolymer, epoxy
Finish:	Hard anodize
Maximum Operating Depth:	1000M (3,300 ft)
Dimensions:	89mm (3.5in) dia. x 120mm (4.75in) high
Weight:	in air 1.1kg (2.4lb)

2. SYSTEM DESCRIPTION

The Imagenex Model 863-000-200 Digital Altimeter is a self contained module which includes a transducer, a transmitter, a receiver, and a microcontroller. It operates by transmitting a short acoustic pulse, and then detecting the echo from the bottom or other large object. It measures the time from the transmitted pulse until the echo is received and outputs this time to the serial port.

The module is packaged to operate underwater at depths to 1000 M (3,300 feet). Typical applications for this product include a remotely operated vehicle (ROV) altimeter, an autonomous underwater vehicle (AUV) altimeter and any other application where ranges must be measured underwater.

3. INSTALLATION INSTRUCTIONS

3.1 MOUNTING DIMENSION DRAWING 345-006

3.2 INSTALLATION

The altimeter is normally mounted vertically, with the transducer face pointing vertically down at the bottom. The transducer face must have a clear unobstructed view. The altimeter can be mounted by means of the tapped holes on the connector end cap or it can be clamped around its diameter.

The anodized housing should be protected by plastic or rubber isolation to prevent damage. Due consideration should be given to materials used to clamp the housing, and to electrical isolation from dissimilar metals, to avoid galvanic corrosion of the housing. The altimeter should be protected from physical damage by collision with the bottom or other objects.

The electrical connector should be protected from physical damage and the cable should not be bent sharply near the connector.

Underwater Connector Guidelines:

Lubricate with silicone grease before assembly
Mate with minimum twisting and flexing
Align index pin and socket carefully
Do not damage or bend pins in unmated condition

On a typical ROV installation, the IMAGENEX supplied cable connector is spliced to a customer supplied cable harness on the vehicle. The splice should be suitable for underwater operation. Suitable splices include cast epoxy splices, cast polyurethane splices, moulded rubber splices (so called hot splices) and tape splices. This will pass into the vehicle pressure hull or a junction box. The four conductors will be split into two conductors for power, connected to a suitable power supply in the vehicle's power distribution system and two conductors for the echo sounder serial output.

4. MAINTENANCE

The altimeter should be rinsed with fresh water after each immersion in salt water or dirty fresh water. This will prevent accumulation of salt or other contamination, and help prevent corrosion of the aluminum and stainless steel parts. The altimeter should be inspected periodically for signs of galvanic corrosion.

The transducer face should be carefully cleaned with a detergent solution to remove any oil, grease or other deposits which may reduce the acoustic performance of the unit.

Model 863-000-200 DIGITAL ALTIMETER DISASSEMBLY AND ASSEMBLY

The altimeter is a complex precision package. We recommend that only personnel familiar with miniature underwater electronic/mechanical devices attempt to service or repair this device.

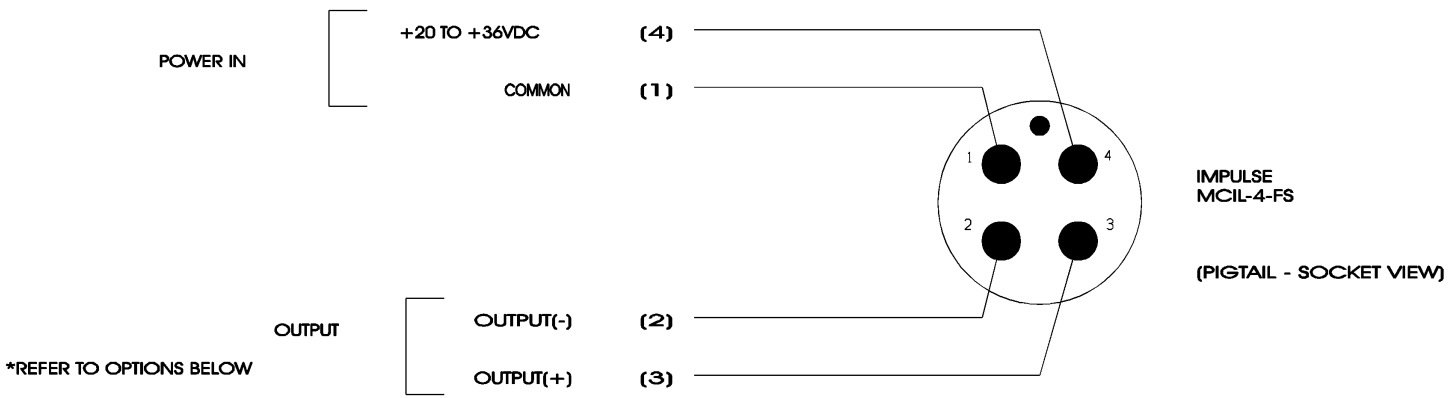
Refer to the assembly drawing to understand the general construction of the Underwater Unit.

The connector end cap can be removed by removing the four hex socket cap screws on the connector end cap and carefully withdrawing the end cap.

Extreme care must be taken when reassembling the Underwater Unit. The O-ring groove and sealing face should be carefully cleaned and inspected. After cleaning, the groove and face should be coated with a thin uniform coat of silicone grease. A new o-ring should be used if possible. The o-ring should be carefully cleaned and inspected for defects, and then lubricated with a thin uniform coat of silicone grease. A small scratch in the o-ring groove or sealing face, a small piece of dirt, or a defect in the o-ring, can cause leakage and consequent flooding of the unit.

5. WIRING DIAGRAM

DWG. NO.	863-200-184	MODEL 863 ALTIMETER PIGTAIL WIRING (20-36VDC)



*OPTIONS:

RS-232 OUTPUT

OUTPUT(-) = RS-232 COM
OUTPUT(+) = RS-232 TXD

IMAGENEX Technology Corp.		
Title: 863 ALTIMETER PIGTAIL WIRING (20-36VDC)		
Size: A	Document Number: 862-200-184	REV: 01
Date: April 14, 2005	Sheet 1 of 1	

Here is a sample output from our Model 863 Altimeter:

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$SDDBT,16.93,f,5.16,M,2.821,F
$SDDBT,16.93,f,5.16,M,2.821,F
$SDDBT,16.93,f,5.16,M,2.821,F
$SDDBT,16.86,f,5.14,M,2.810,F
$SDDBT,16.86,f,5.14,M,2.810,F
$SDDBT,16.86,f,5.14,M,2.810,F
$SDDBT,16.93,f,5.16,M,2.821,F
$SDDBT,16.86,f,5.14,M,2.810,F
$SDDBT,15.68,f,4.78,M,2.613,F
$SDDBT,15.55,f,4.74,M,2.591,F
$SDDBT,15.55,f,4.74,M,2.591,F
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- the output is NMEA 0183 (4800,N,8,1)
- RS-232 (optionally RS-485)
- output rate is approximately 3 messages per second.