applied acoustics
underwater technology

Applied Acoustic Engineering Ltd
Marine House, Marine Park,
Gapton Hall Road, Great Yarmouth
NR31 0NB, United Kingdom

T +44 (0)1493 440355
E general@appliedacoustics.com
W appliedacoustics.com

Wireless Acoustic Load Shackle System

Key features

- 25-300 tonne subsea shackle load cells
- Sigma digital bi-directional spread spectrum signalling
- Robust digital telemetry
- Up to 4,000m water depth
- Monitor 4 load points using 3510 PAM
- Monitor strain and position up to 16 shackles with Easytrak Nexus 2 (option)

Applications

- Monitoring load distributions on spreader bars
- Cable strain monitoring
- Safety applications
- Mooring systems
- Ballasting operations

Wireless Load Shackle System Overview

The subsea Acoustic Load Shackle is designed for operations where load monitoring is required, either for short term operations lowering an item to the seabed, or for longer periods monitoring dynamic loads. It is completely wireless, using acoustic signals to transmit data from under the sea to a surface display module, where up to four shackles can be monitored sequentially.

The Acoustic Load Shackle system consists of a Crosby lifting shackle with a bespoke load cell machined to replace the standard pin, an applied acoustics' positioning beacon and a standard applied acoustics' 3510 PAM Portable surface display.

The secure and reliable wireless digital acoustic technology reduces the risk of interference from a 'noisy' environment in which the load cell is required to operate subsea. Its unique ID code ensures there is minimal risk of interference from other positioning or release work in the vicinity.

Technical Specification

ACOUSTIC BEACON MODEL TYPES – PHYSICAL SPECIFICATION

Housing material; Hard anodised aluminium, with clear protection sleeve and stainless steel cage

Model	Beam Pattern	SPL	Survival Depth	Diameter	Length	Weight in Air / Water
1019LS	±90°	188dB	1500m	74mm	395mm	2.90kg/1.40kg
1015LS	±45°	194dB	2000m	74mm	410mm	3.0kg/1.50kg
1039LS	±90°	191dB	4000m	100mm	540mm	6.90kg/ 3.0kg
1035LS	±45°	200dB	4000m	100mm	540mm	6.90kg/ 3.0kg

Beacon Electrical Specification

BATTERY

Battery type	Rechargeable. NiMH as standard
Listening life	Mini beacons: 30 days Midi beacons: 90 days
Operational life	Applied Acoustics' Spread Spectrum at 1.0pps **1019LS**: 75 hours **1015LS**: 75 hours **1039LS**: 60 hours **1035LS**: 150 hours

CONFIGURATION

The system works using spread spectrum technology and will be delivered, as standard, set up to work with AAE spread spectrum channels.

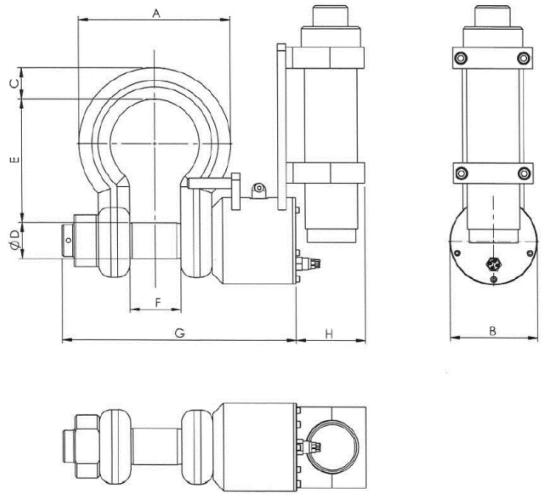
EXTERNAL INPUTS

Connector type	MCBH8M 8-way connector
Responder key	+ 5 to 25 Volts
External Power	22 to 35 VDC @80mA
Charge	Onboard fast charger for 3 hour charge, typical. Activated and monitored via 1082 Smart Switch or 1083 Multi-Charger

Registration No. QU180081a
ISO9001:2015

Shackle Physical Specification

Dimensions in mm										
	A	B	C	D	E	F	G	H	Proof Test SWL	Accuracy
25 Tonne	225	125	47	52	163	73	335	102	150%	1.5%
55 Tonne	324	125	67	70	249	105	420			
85 Tonne	340	125	75	83	311	127	460			
120 Tonne	416	125	89	95	358	150	518			
200 Tonne	530	142	120	125	458	180	615			
300 Tonne	565	180	130	150	540	205	655			



SHACKLE DETAILS

Max. Survival depth	4,000m
Max. Operating depth	2,000m
Battery	14.8V Rechargeable Li-Ion 8 cell 5.4Ah
Self-discharge	<5% per month @ 20°C, <10% @ 30°C, <20% @ 40°C
Life	72,000 samples or 2 months.
Material	17-4PH H1150+11560 stainless steel
Calibration	Supplied with calibration, proof load & test certificates to BS EN 10002/2 1992

Beacon and Shackle Compatibility

- 3510 PAM Portable and 3190 MF dunker
- Easytrak Nexus 2 USBL

Options

- Increased depth rating
- Stainless transponder housing
- External subsea battery pack

In partnership with dlm

applied acoustics
underwater technology

Due to continual product improvement specification information may be subject to change without notice.
Wireless Acoustic Load Shackle October 2020

Registration No. QU180081a
ISO9001:2015