

Evo Logics®

UNDERWATER ACOUSTIC MODEMS

PRODUCT INFORMATION GUIDE



UNDERWATER ACOUSTIC MODEMS

Evologics underwater acoustic modems provide full-duplex digital communication using Evologics' patented S2C (Sweep-Spread Carrier) Technology, delivering an excellent performance, resistant to the challenges of the dynamic subsea environment. Self-adaptive algorithms adjust the S2C parameters to maintain the highest bitrate possible in current conditions.

Every Evologics underwater acoustic modem implements advanced data delivery algorithms, supports addressing and networking and is easy to control with a comprehensive set of commands and software-configurable settings.

- Use as transponders, beacons and pingers - all modems are fully compatible with Evologics USBL/LBL positioning systems and can facilitate simultaneous communication and navigation.
- WiSE and SDM devices offer extra opportunities for developers.
- OEM versions without housing and streamlined transducer units are available for system integration with UUVs.



APPLICATIONS

Oil & Gas

Support deepwater oil and gas exploration with a reliable communication system that provides real-time transmissions of sensor data or sending commands to remote equipment

Unmanned Underwater Vehicles (ROVs and AUVs)

Real-time tracking and data acquisition, command transmissions with instant messaging feature - send commands on top of the main data flow from sensors or cameras

Oceanography

Collect measurement data from various sensors in real-time or over periodic intervals, store and transmit data with adjustable priorities. Low power consumption and a power saving wake-up module enable long-term deployments

Monitoring Stations

Integrate the communication system with a power source, multiple sensors and an acoustic releaser for a fully autonomous solution for long-term data collection missions

Seismic

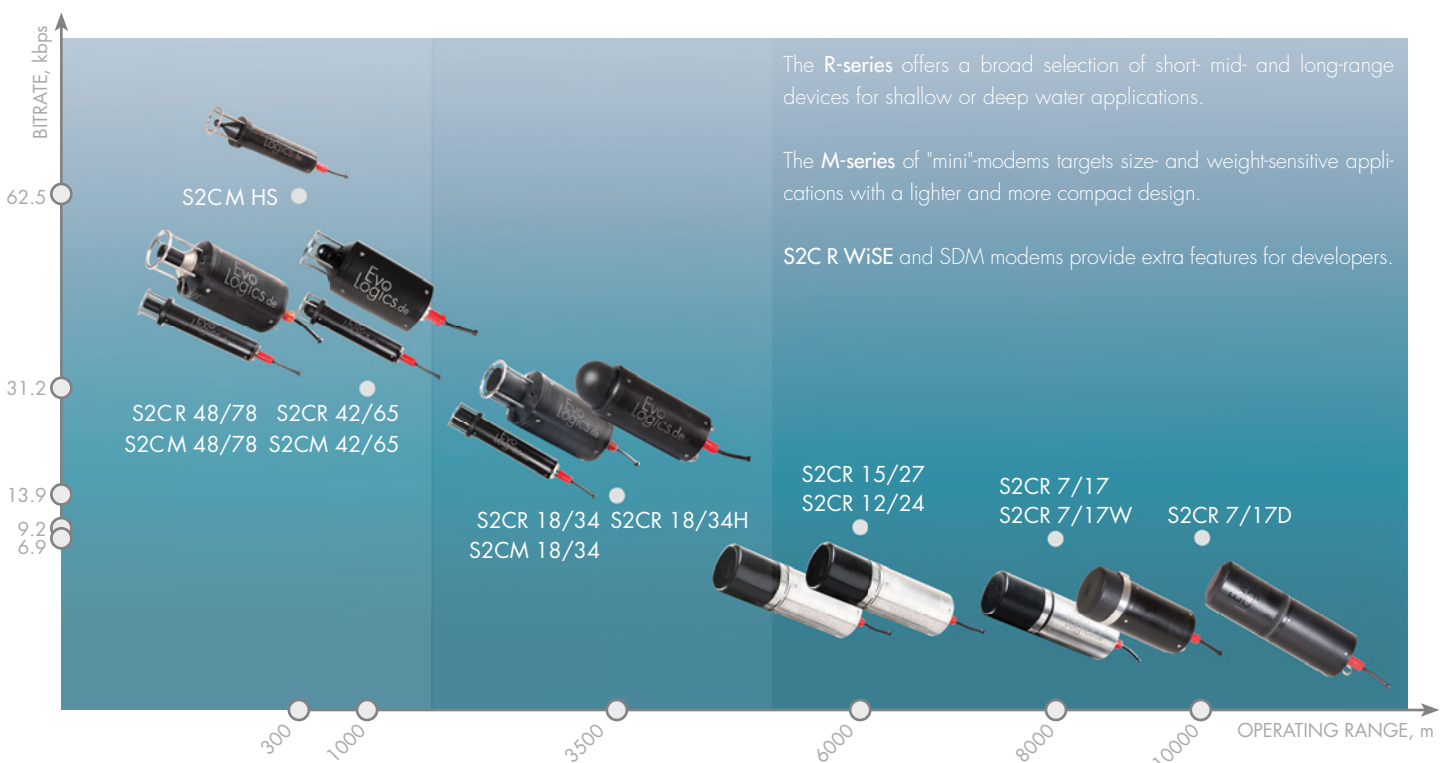
Collect seismic data and use the instant messaging feature for alarm-triggering events

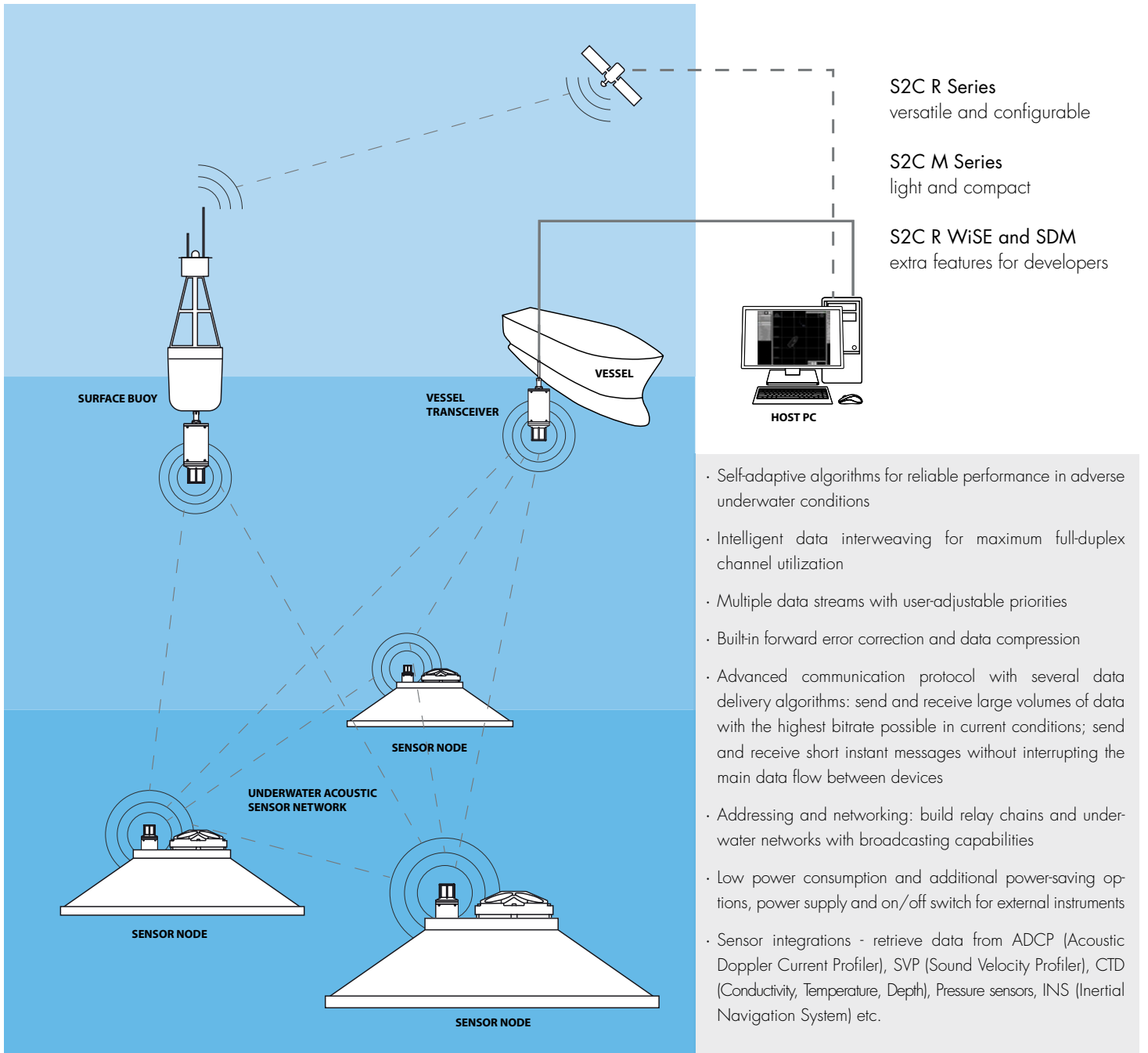
Networks and Relay chains

Transmit information over longer distances or cover a larger area

Information and Communication Centers

Advanced data management and expandable modular design can become the central point for all your underwater communication needs





DEVELOPER TOOLS

S2C WiSE-Series modems: the sandbox - an embedded network protocol development platform - provides an excellent testbed. Run custom networking scripts, sensor-specific data preprocessing scripts and modules directly on real hardware in real-world conditions.

S2C Modem Emulator: test protocols and/or application solutions without underwater modems. A time-saver for code debugging and refinement. Solutions, designed and tested with the emulator, are easy to export to modem hardware. Available over remote access or as a standalone EvoLogics Modem Emulator Box.

Software Defined Modem (SDM) mode: transmit and receive arbitrary waveforms and set a reference to trigger signal detection.

S2CR WiSE Modems

GENERAL	Same as S2CR-series modems
FIRMWARE	16-64 MB sandbox (extendable up to 64 GB with SD card)



SPECIFICATIONS AND CONFIGURATION OPTIONS

		S2CR 48/78	S2CR 42/65	S2CR 18/34	S2CR 18/34H	S2CR 15/27	S2CR 12/24	S2CR 7/17	S2CR 7/17D	S2CR 7/17W	S2CM 48/78	S2CM 42/65	S2CM 18/34	S2CM HS	S2CR 48/78WISE	S2CR 18/34WISE	
GENERAL	OPERATING DEPTH	Delrin 200 m	200 m	200 m	200 m	200 m	200 m	200 m	200 m	200 m	200 m	200 m	200 m	200 m	200 m	200 m	
	Aluminium Alloy	2000 m	2000 m	2000 m	2000 m	2000 m	2000 m	2000 m	2000 m	2000 m	not available				not available		
	Stainless Steel	2000 m	2000 m	2000 m	2000 m	2000 m	2000 m	2000 m	2000 m	2000 m	2000 m	2000 m	2000 m	2000 m	not available		
	Titanium	2000 m	2000 m	2000 m	2000 m	6000 m	6000 m	6000 m	10000 m upon request	6000 m	not available				not available		
OPERATING RANGE		1000 m	1000 m	3500 m	3500 m	6000 m	6000 m	8000 m	10000 m	8000 m	1000 m	1000 m	3500 m	300 m	1000 m	3500 m	
FREQUENCY BAND		48 - 78 kHz	42 - 65 kHz	18 - 34 kHz	18 - 34 kHz	15 - 27 kHz	13 - 24 kHz	7 - 17 kHz	7 - 17 kHz	7 - 17 kHz	48 - 78 kHz	42 - 65 kHz	18 - 34 kHz	120 - 180 kHz	48 - 78 kHz	18 - 34 kHz	
TRANSDUCER BEAM PATTERN		horizontally omnidirectional	wide-angle 100 degrees	horizontally omnidirectional	hemispherical	wide-angle 120 degrees	directional 70 degrees	hemispherical	directional 80 degrees	hemispherical	horizontally omnidirectional	wide-angle 100 degrees	horizontally omnidirectional	omnidirectional	horizontally omnidirectional	horizontally omnidirectional	
CONNECTION	ACOUSTIC CONNECTION	up to 31.2 kbit/s	up to 31.2 kbit/s	up to 13.9 kbit/s	up to 13.9 kbit/s	up to 9.2 kbit/s	up to 9.2 kbit/s	up to 6.9 kbit/s	up to 6.9 kbit/s	up to 6.9 kbit/s	up to 31.2 kbit/s	up to 31.2 kbit/s	up to 13.9 kbit/s	up to 62.5 kbit/s	up to 31.2 kbit/s	up to 13.9 kbit/s	
	BIT ERROR RATE	less than 10 ⁻¹⁰						less than 10 ⁻¹⁰			less than 10 ⁻¹⁰				less than 10 ⁻¹⁰		
	INTERNAL DATA BUFFER	1 MB, configurable						1 MB, configurable			1 MB, configurable				1 MB, configurable		
	INTERFACE ¹⁾	Ethernet or RS-232						Ethernet or RS-232			Ethernet or RS-232				Ethernet only		
	INTERFACE CONNECTORS	up to 4 connectors, Ethernet and serial combinations						up to 4 connectors, Ethernet and serial combinations			1 connector				1 connector		
POWER	POWER CONSUMPTION ²⁾	Stand-by Mode 2.5 mW	2.5 mW	2.5 mW	2.5 mW	2.5 mW	2.5 mW	2.5 mW	2.5 mW	2.5 mW	2.5 mW	2.5 mW	2.5 mW	0.5 mW	2.5 mW	2.5 mW	
	Listen Mode	5 - 285 mW	5 - 285 mW	5 - 285 mW	5 - 285 mW	5 - 285 mW	5 - 285 mW	5 - 285 mW	5 - 285 mW	5 - 285 mW	not available				5 - 285 mW	5 - 285 mW	
	Receive Mode	0.8 W	0.8 W	0.8 W	0.8 W	0.8 W	0.8 W	0.8 W	0.8 W	0.8 W	0.8 W	0.8 W	0.8 W	0.8 W	0.8 W	0.8 W	
	Transmit Mode	up to 60 W	up to 40 W	up to 65 W	up to 65 W	up to 65 W	up to 57 W	up to 45 W	up to 65 W	up to 70 W	up to 55 W	up to 35 W	up to 55 W	up to 8.5 W	up to 60 W	up to 65 W	
POWER SUPPLY OPTIONS ³⁾	External	24 VDC (12 VDC)						24 VDC (12 VDC)			24 VDC (12 VDC)				24 VDC or 12 VDC		
	Internal	Rechargeable battery 5 Ah or 10 Ah						Rechargeable battery 5 Ah or 10 Ah			not available				not available		
PHYSICAL	HOUSING OPTIONS	Delrin	Plastic non-magnetic corrosion-resistant housing for short-term deployments, depth rating 200 m						✓	✓	✓	✓	✓	✓	✓	✓	✓
	Aluminium Alloy	Light metal housing for short-term deployments, depth rating 2000 m						✓	✓	✓	not available				not available		
	Stainless Steel	Robust metal, suitable for long-term deployments in harsh environments, depth rating 1000 m or 2000 m						✓	✓	✓	✓	✓	✓	✓	not available		
	Titanium	Corrosion resistant housing, suitable for long-term deployment in harsh environments, depth rating 6000 m						✓	✓	✓	not available				not available		
DIMENSIONS ⁴⁾	Housing	∅110 x 178 mm	∅110 x 178 mm	∅110 x 178 mm	∅110 x 218 mm	∅113 x 220 mm	∅113 x 220 mm	∅113 x 260 mm	∅110 x 178 mm	∅110 x 178 mm	∅63 mm x 235 mm	∅63 mm x 235 mm	∅63 mm x 235 mm	∅63 mm x 235 mm	∅110 x 170 mm	∅110 x 170 mm	
	Total length	265 mm	265 mm	265 mm	300 mm	390 mm	390 mm	420 mm	338 mm	246 mm	310 mm	300 mm	310 mm	310 mm	265 mm	265 mm	
WEIGHT, dry/wet	Delrin	2250/400 g	2300/300 g	2245/400 g	3100/TBC g	2990/490 g	2990/490 g	4700/600 g	6200/600 g	3000/490 g	1120/330 g	1210/420 g	1265/480 g	1120/330 g	2250/400 g	2445/400 g	
MODULES AND OPTIONS	WAKE-UP MODULE ⁵⁾ not compatible with Ethernet	The Wake Up Module turns the rest of the device on if it detects incoming acoustic signals or incoming data on one host interface. Once the device completes receiving or transmitting data, it switches itself off. 2-channel version available for R-series						✓	✓	✓	✓ single-channel version only				not available		
	POWER SWITCH ⁶⁾ not compatible with Ethernet	The Power Switch allows to provide power supply to up to 4 external instruments and turn them on/off on command						✓	✓	✓	not available				not available		
	ADVANCED TIMEKEEPING MODULE	Allows to accept 1 PPS input from GPS, optionally includes a Chip Scale Atomic Clock for highly precise timekeeping						✓	✓	✓	✓ only available for OEM modem versions				not available		
	SDM VERSION	Software Defined Modem mode: transmit/receive arbitrary waveforms and set a reference to trigger signal detection						✓	✓	✓	✓	✓	✓	✓	not available		
	ACOUSTIC RELEASE DEVICE	Reliable mechanism for recovery of underwater assets to the surface. Also available in OEM version for system integration						✓	✓	✓	not available				not available		
	FLOATATION COLLAR	Floatation collar for fast recovery to the surface						✓	✓	✓	not available				not available		
	PRESSURE SENSOR	Accurate pressure measurements						✓	✓	✓	not available				not available		
	CABLE-MOUNTED TRANSDUCER	Separated transducer for easier system integration. Standard cable length 1.5 m, other upon request.						✓	✓	✓	✓	✓	✓	✓	✓	not available	
	OEM VERSION	Version without housing: transducer and electronics for system integration						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
APPLICATIONS	Fast short and medium range transmissions in horizontal channels	Fast short and medium range transmissions in vertical, slant and horizontal channels	Medium range transmissions in horizontal channels	Medium range transmissions in slant channels	Long range transmissions in vertical and slant channels, ong-term deployment	Long range transmissions in vertical and slant channels, long-term deployment	Long range transmissions in vertical and slant channels, depth-rated	Long range transmissions in vertical channels, depth-rated	Long range transmissions in slant channels, depth-rated	Fast short and medium range communication for UUVs	Fast short and medium range communication for UUVs	Medium range communication for UUVs	High-speed short range communication for UUVs and divers	Underwater network protocol development	Underwater network protocol development		

¹⁾ One RS-232 Interface can be replaced with a RS-422 interface. Contact Evologics for more information!

²⁾ Power consumption for RS-232 interface. Add 500 mWV if an Ethernet interface is installed. Add 300 mWV if the Wake-Up Module is installed. User-configurable Listen Mode is only available with a Wake-Up module installed. Power consumption in Listen Mode depends on Listen Mode settings.

³⁾ Contact Evologics for more information on external and internal power supply options!

⁴⁾ S2CR 48/78, 18/34 - dimensions of a Delrin housing, other builds are slightly larger; S2CR 12/24, 7/17 - dimensions of a titanium housing, other builds are slightly smaller. Contact Evologics for more information on device dimensions and weights!

⁵⁾ **The Wake Up Module is only compatible with RS-232 interface!** It is not compatible with Ethernet or RS-422. 2-channel Wake Up Module version reacts to incoming data on two serial interfaces.

⁶⁾ **The Power Switch is only compatible with RS-232 interface!** It is not compatible with Ethernet or RS-422.

ABOUT US

EvoLogics GmbH develops underwater information and communication systems based on bionic concepts, combining cutting edge engineering with the best ideas found in nature. The advanced product features have become enabling technologies for deep water exploration and production.

EvoLogics range of products offers highly reliable, flexible and cost-effective solutions for multiple underwater communication, positioning, navigation and monitoring applications. We strive for innovation and invest our vast experience into developing, manufacturing and supporting products that deliver an excellent performance and solve the most challenging tasks.

The company was founded in 2000 in Berlin, Germany, by a group of leading international scientists and maritime engineering experts. The company since focuses on developing innovative solutions for maritime and offshore industries, as well as smart robotic systems design and bionic research.

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