

Ping360 Scanning Imaging Sonar



The Ping360 scanning sonar is a mechanical scanning imaging sonar. It's designed primarily to be used on the [BlueROV2](#) and other ROVs for navigation in low-visibility water conditions, but it's also suited for applications such as inspection, obstacle avoidance, target location and tracking, autonomous systems development, and more!

What is a Scanning Sonar?

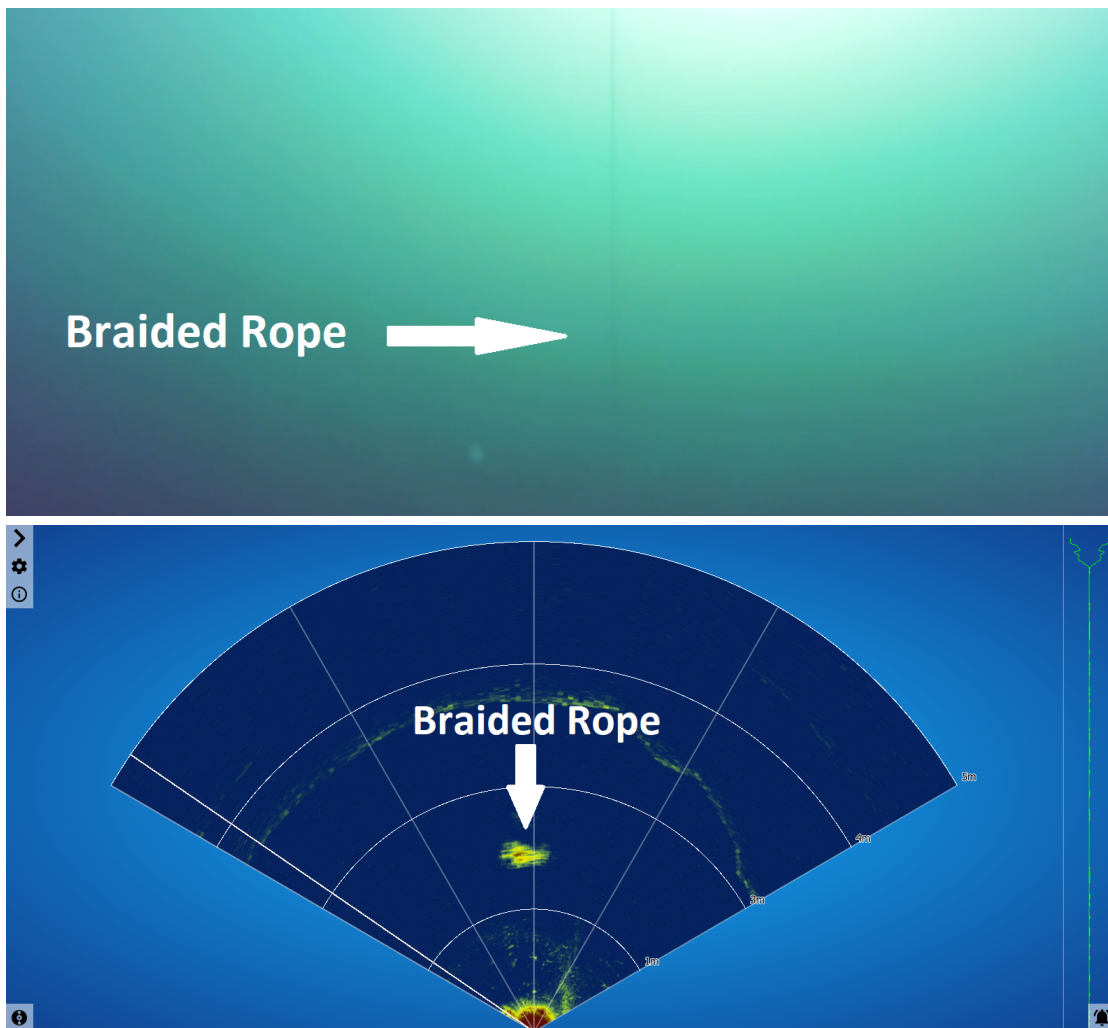
If you're new to scanning sonars, here's how it works: inside the Ping360 is an acoustic transducer that sends a narrow beam of acoustic energy into the water and then listens back for echoes. That transducer is mounted to a motor that rotates it in one degree increments and as it does this it generates a circular image of the sonar's surroundings with a maximum range of 50 meters (165 feet). The result is similar to what you might see from a weather radar on the local news or a laser scanner on an autonomous robot. Here's an example of a scan of dock pilings straight ahead of the BlueROV2:

When mounted on an ROV, the scanning sonar gives you a top-down view of the ROV's surroundings. You can see echoes from objects like ropes, walls, dock pilings, rocks, shipwrecks, boats, fish, and any other structures or objects that reflect sound waves. With that, you have reference points to navigate from, regardless of water visibility, and you can locate important features in the water quickly. Here's an example of a 120 degree sector scan showing a rope in front of the sonar:

What's Inside

The Ping360 is designed with an oil-filled section at the top that houses the acoustic transducer and an air-filled section at the bottom. It has an anodized aluminum case and a 1 meter (3.3 foot) cable with a pre-installed cable penetrator. It's rated to a maximum depth of 300 meters (984 feet). The bottom has four M3 mounting holes and interfaces with an included bracket that makes it easy to install on the BlueROV2 and in other applications.

The sonar operates at an acoustic frequency of 750 kHz and has a beam width of 2 degrees horizontally and 25 degrees vertically. Electrically, it can be powered from any clean 11-25 V power source and it communicates via USB, RS485, or Ethernet.



User Interface

The Ping360 connects to the [open source Ping-Viewer application](#) for control and data display. Ping-Viewer runs on Windows, Mac, and Linux and can connect to the Ping360 through a direct connection to the computer or through the [Companion](#) web interface on the BlueROV2.

For those who wish to integrate the Ping360 scanning sonar into other systems and access the data directly, it communicates with a binary message format called the [Ping-Protocol](#). We've have Arduino and Python libraries for the Ping-Protocol to get you up and running almost immediately.

Check out the Technical Details and Learn tabs above for more information!

Technical Details

Specifications

Parameter	Value
Electrical	
Maximum Supply Voltage	25 volts
Minimum Supply Voltage	11 volts
Maximum Power Consumption	5 W
Communication Protocols	USB, Ethernet, RS485
Cable	

Cable Diameter	4.5 mm	0.18 in
Cable Length	1 m	40 in
Cable Jacket	Black Polyurethane	
Conductor Insulation	FEP	
Conductor Gauge	28 AWG	
Power Wires	Black - Ground	
	Red - Vin	
USB Configuration	Orange-White - Vsense	
	Green-White - D-	
	Green - D+	
	Orange - GND	
Ethernet Configuration	Orange-White - TX+	
	Green-White - RX+	
	Green - RX-	
	Orange - TX-	
RS485 Configuration	Orange-White - Not Used	
	Green-White - D-	
	Green - D+	
	Orange - GND	
Acoustics		

Frequency	750 kHz	
Beamwidth - Horizontal	2°	
Beamwidth - Vertical	25°	
Minimum Range	0.75 m	2.5 ft
Maximum Range	50 m	165 ft
Range Resolution	0.08% of range	
Range Resolution at 50m	4.1 cm	1.61 in
Range Resolution at 2m	1.6 mm	0.06 in
Mechanical Resolution	0.9°	
Scanned Sector	Variable up to 360°	
Scan Speed at 2 m	9 sec / 360° *	
Scan Speed at 50 m	35 sec / 360° *	
Continous 360 degree scan?	Yes	
Mounting Angle Offset?	Yes	
Physical		
Pressure Rating	300 m	984 ft
Weight in Air (w/ cable)	510 g	18 oz
Weight in Water (w/ cable)	175 g	6.17 oz
Sonar Mounting Screw Size	M3x0.5 x 5 mm	
Mounting Bracket Screw Size	M5x0.8 x 12 mm	

