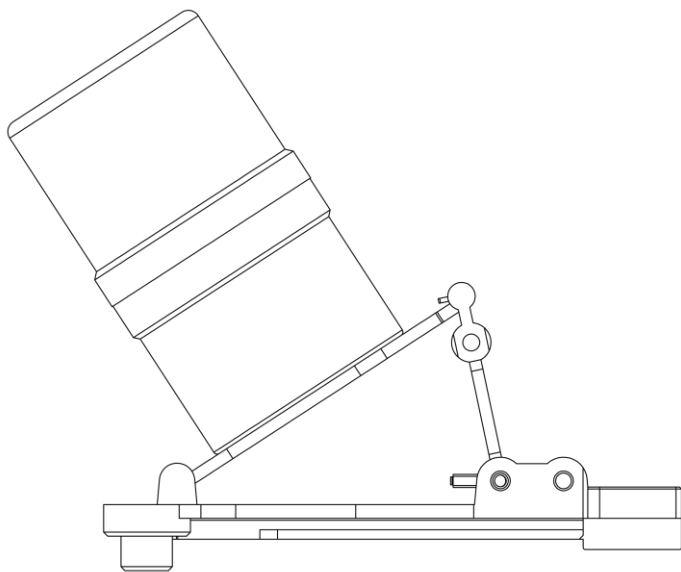


GTP_SONAR-M2

User Manual

V1.0.1 2020.12



1、 Introduction

GTP_SONAR-M2 Omnidirectional Scanning Sonar is an omnidirectional dual-frequency mechanical scanning imaging sonar system. This sonar is a miniaturized and with multifunction as high-resolution imaging for underwater detection, underwater object scanning and pipeline profile detection. Mainly used for underwater object detecting and imaging, pipeline silt measurement, pipeline profile, detection of suspended objects in water, objects protruding from the bottom of the seabed, and collision avoidance during operation. It has advantages such as small size, light weight, low magnetism, corrosion resistance, clarified display and easy to operate.

Suitable for installation on various submersibles and platforms, it is a powerful assistance for underwater construction and target detection. Portable and could be applied with T1 Pro for real-time operation. Sonar processing software could be run on WinXP, Win7 and other OS to achieve control, data collection, recording and playback function of sonar scanning.



Precautions

- It is recommended that all troubleshooting should be completed by trained professional technicians. The sonar circuits are very sophisticated. Before troubleshooting, you should be familiar with the location of these circuits. Otherwise, it may cause personal injury or device damage.
- If the sonar works on shore for more than 5 minutes, it may cause serious damage to the sonar electronic system. Avoid direct sunlight during sonar operation at high temperatures.
- The depth level of the sonar is 300 meters. Operations deeper than 300 meters may damage the sonar.
- It is recommended to be extra careful when operating the sonar at a height of less than 4 meters from the bottom.

- When using the software, follow the User Manual carefully. If there is any question or abnormal operation of the software during use, you can contact us soon.
- The software must be used with encrypted USB driver, make sure to insert the encrypted USB driver to the PC before use, please keep it properly, and contact our company in time when it lost.

Catalog

1、Introduction	2
2、Installation and Start	5
Task Mode	5
1. Omnidirectional Scan Mode	5
2. Sector Scan Mode	5
Device Installation	5
Device Start	6
3、PC Software Description	7
Software Introduction	7
Operating Environment	7
User Manual	7
1. Document Operation	7
a. Data Recording	7
b. Data Playback	8
c. Image Snapshot	8
d. Snapshot Playback	8
2. Palette Option	9
Default	9
Red	9

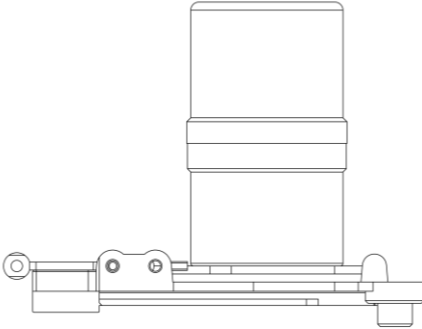
3. Sonar Operation	9
a. Mode Selection	9
b. Frequency Selection	10
c. Range Selection	10
d. Enhance Selection	10
e. Section display mode	10
f. Grid Switch	10
g. Emission Delay	11
h. Sonar Heading	11
i. Scan Switch	11
4、 Maintenance	11
5、 Specification.....	12
6、 After-Sales Service	13

2、Installation and Start

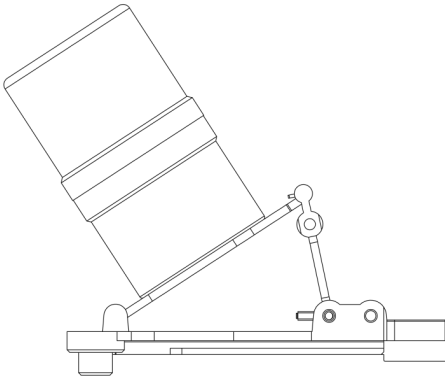
Task Mode

According to the different tasks the sonar performs, Choose 360° omnidirectional scan mode or sector scan mode. The installation method and position of sonar are different in different scanning modes.

1. Omnidirectional Scan Mode



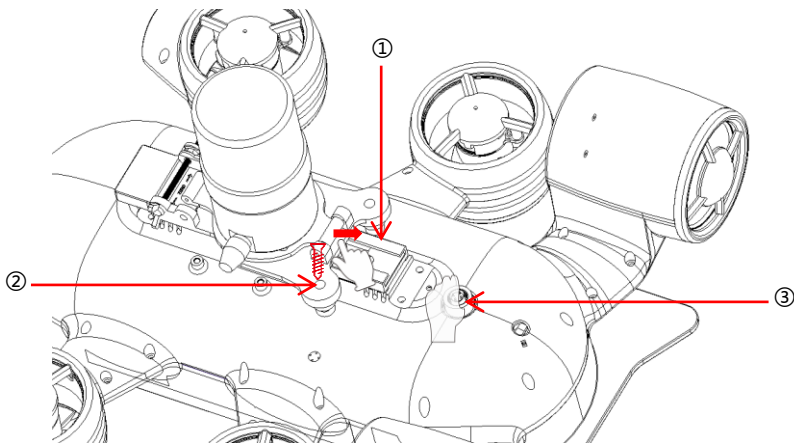
2. Sector Scan Mode



Device Installation

According to the direction indicated by the arrow, slide the omnidirectional scanning sonar support into the slide rail at the bottom of the underwater robot, install the screws after sliding into place.

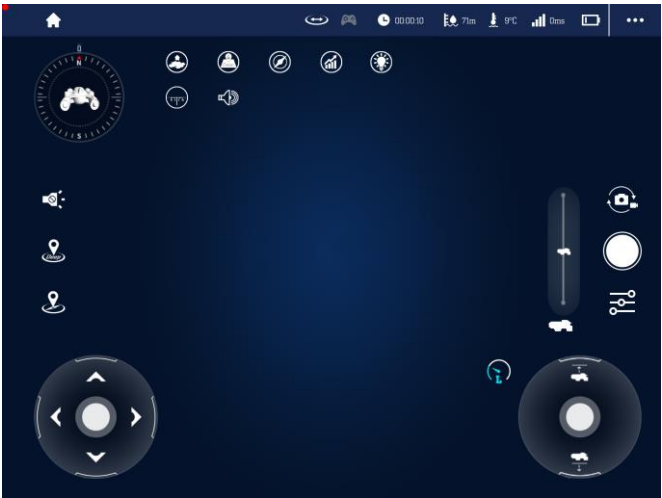
Connect the 8-pin connector at the tail of the omnidirectional scanning sonar to the T1 Pro sealed socket and tighten it clockwise.



① Bottom slide rail ② Installation screw positioning ③ Tighten clockwise

Device Start

On the Geneinno APP control page, click the sonar icon, start the sonar.



APP operation guide please refer
"Genneino Underwater Drone T1Pro User Manual"

3、PC Software Description

Software Introduction

The Dedicated PC software is a customized display and control software specially developed by our company for this type of sonar. Users can use this software to operate the sonar, read the data detected by the sonar and generate images.

The software includes basic functions such as data recording, playback, and snapshot. You can also set enhance sonar gain, display range setting, display mode, emission delay and other settings.

Operating Environment

The Dedicated PC software could be run in OS such as windows 7/10/Server 2016.

User Manual

1. Document Operation

This part contains five sub-items, which are data recording, data playback, image snapshot, snapshot playback, and exit. This part is the interface for selection of software working status.

a. Data Recording

The sonar software provides a data recording function, the sonar data can be stored in USP format while the sonar is operating. The steps as below.

Step 1: Start the software

Step 2: Click the "Document Operation" menu bar, click the "Data Recording" , the interface shown as the image below.

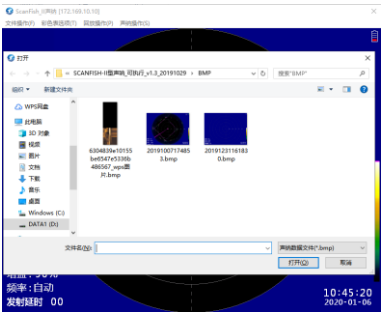
Step 3: Name the file and select the storage folder to save the data.

Step 4: Then the sonar data will be stored during the software is running, and the stored file format is .USP.

The snapshot image is in bmp format and stored in the BMP folder in the software folder.

d. Snapshot Playback

To replay the bmp image generated by the image snapshot function, click "snapshot playback" to open the interface as shown below, select the image to playback.

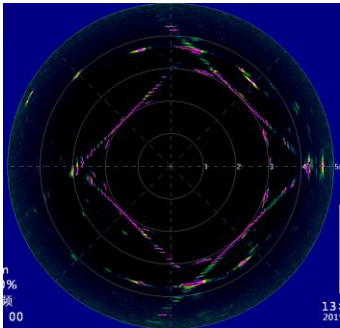


Snapshot Playback Data Selection

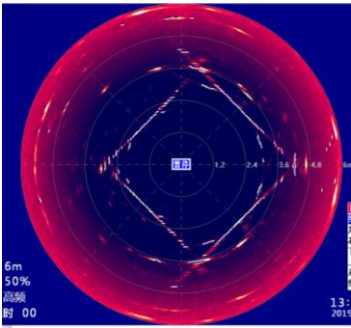
2. Palette Option

This option is the palette option for the sonar image display. It offers "Red" , "Bronze" , "High Contrast" , "Cool Tone" , "Warm Tone" , "Grayscale" for your selection.

Select different color palette, the interface will change into a different style as the color palette changes, the data won' t change.



Default

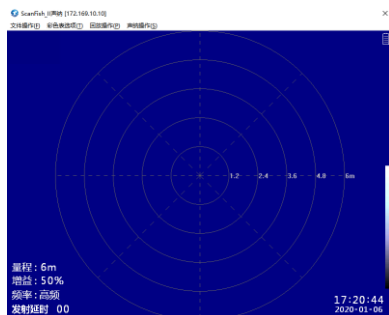


Red

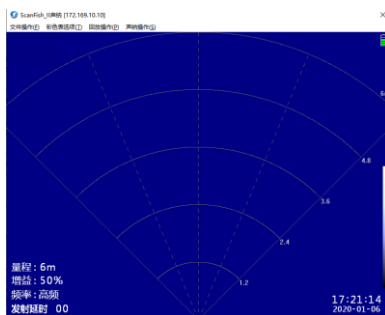
3. Sonar Operation

a. Mode Selection

Omnidirectional scan (PPI) and Sector scan are two sonar operation modes, PPI displays a whole circular area with the sonar as the center, and Sector displays a fan-shaped area.



Omnidirectional scan (PPI)



Sector scan

b. Frequency Selection

The working frequency of sonar can be set to three levels: auto, low frequency and high frequency:

- In auto level, when the range is less than 12m, it is high frequency, and when the range is greater than or equal to 12m, it is low frequency.
- In the low frequency mode, no matter at what range, it works at low frequency.
- In the high frequency mode, no matter at what range, it works at high frequency.

c. Range Selection

This option is used to adjust the display range of sonar software. The adjustable range is: 1m, 2m, 3m, 4m, 5m, 6m, 7m, 8m, 9m, 10m, 15m, 20m, 25m, 30m, 35m, 40m, 45m, 50m, 55m, 60m. Users can adjust this option according to their needs.

d. Gain Selection

Used to adjust the amplification effect of the sonar signal, users can choose according to actual usage from 10% to 100%.

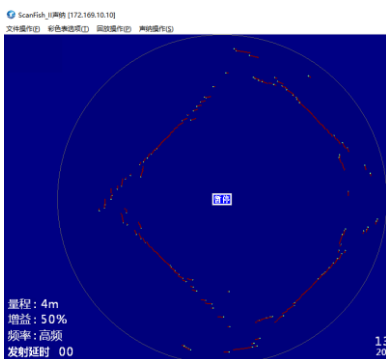
e. Section display mode

It is used to select the display mode of the software, they are "section", "overlay" and "image" three options.

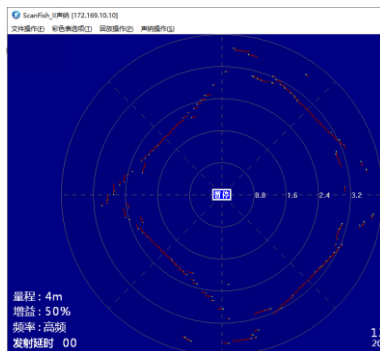
The profile is the profile line showing the current section lines, the image is the image data showing the current cross section image of the sonar, overlay is to overlay the profile line and image data on the software interface.

f. Grid Switch

The option is used to switch the grid line on/off in the software interface, and the switch effect shown as below.



Grid switch off



Grid switch on

g. Emission Delay

The emission delay guarantees the minimum interval between adjacent beams, the default is 0, the adjustable range is 0-30ms. This function is used in environments with severe reverberation, and generally does not need to be set.

h. Sonar Heading

Since the direction of the sonar emitting device is fixed, however, there may be multiple situations in the installation of sonar during actual use. This option requires the user to determine the orientation of the sonar probe for correct input according to the actual installation situation.

i. Scan Switch

"Pause Scanning" and "Continue Scanning" are used to pause and continue sonar scanning when the sonar is running.

4、Maintenance

- The soft sound-permeable cover is filled with oil, so the sound-permeable cover cannot be scratched during work and maintenance. In addition, the acoustic cover is made of polyurethane, which is resistant to oil but not resistant to organic solvents. When cleaning the surface of the probe, you can use a soft cloth dipped in detergent to clean the acoustic cover and titanium alloy surface. It is strictly forbidden to clean the acoustic cover with alcohol or organic solvents.
- Sonar cables need to be inspected regularly during the life cycle of the equipment. Once find that the cable surface is damaged or the cable is hardened and other undesirable phenomena need to be repaired or replaced, you can contact us for assist.
- If the equipment is not used for a long time, the equipment needs to be tested regularly. The method refers to the underwater test method in the previous article. Once the equipment is found to be operating abnormally, you can contact us for assist.
- Due to the material of the sonar probe and cable, the storage environment of sonar needs to avoid direct sunlight and dry at low temperature.
- During the storage process, it is strictly forbidden to pull the cable of the sonar. The cable should be stored in a stretched state and cannot be excessively bent. Particular attention to the joints of the sonar and not

excessive bending.

- The sonar should be stored in a packing box with sufficient buffer measures to avoid squeezing, scratching the probe, etc. that may damage the sonar.
- The box stores the sonar can prevent a some packaged dryers. Meantime, sonar should be kept away from organic solvents.

5、Specification

Dimension	φ57 mm * 99 mm
Materia	Standard 316 stainless steel (can be customized to titanium alloy)
Weight	625g
Buoyancy	Zero buoyancy in water (with extra buoyancy material)
Working Mode	Mechanical scanning imaging
Input Power	24±3 VDC
Power Consumption	Average 10W, maximum 20W (at the moment of power-on)
Maximum Depth	300m
Working Frequency	Low frequency: 667±5 kHz
	High frequency: 2±0.02 MHz
Frequency Switch	Auto (according to the detection range)/manual
Beam Width (customizable)	Low frequency: Horizontal 2.6±0.3°; vertical 7.5±1.5°
	High frequency: Horizontal 0.9±0.1°; vertical 2.5±0.5°
Distance pixels/precision	Low frequency: 1.5cm
	High frequency: 2.00mm @2MHz, 1m; 2.60mm @2MHz, 2m; 5.00mm @2MHz, 6m
Scan Range	Low frequency: 0.15~60m
	High frequency: 0.15~15m
Scan area	PPI: Omnidirectional 360°
	Sector: default 60°, adjustable

Scan speed	Two speed: Fast scan / High-resolution scan
Refresh Rate	1Hz @1m
Working Temp	-2°C~36°C
Storage Temp	-20°C~50°C
Transmission Communication	Ethernet interface (232/485 serial port as optional)
Mechanical Connector	T1 Pro specialized 8-pin connector
Software	Dedicated PC software for real-time observation, recording and review

6、After-Sales Service

When you use the omnidirectional scanning sonar (GTP_SONAR-M2), if you have any inquiries about use, maintenance, safety and other issues, you can contact us through various after-sales services provided by the company's official website.

- If product fails during use, contact our company's after-sales service directly for consultation, in case not to delay your use and maintenance time limit of the product.
- This product implements the tracking service of the whole device, from the date of purchase by the customer, and the warranty last one year. During the warranty period, the company is responsible for free repairs due to the failure of the equipment itself. The device shell is scratched or impacted and damaged due to user use, as well as self-disassembly or self-repair, etc., will not enjoy free maintenance term.
- Repair fee will be charged when the warranty period is exceeded.
- Apply after-sales service, please log on to the company website to check the latest after-sales process.

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