

# Model 5103A

## System Settings and User Notes



**The World Leader in  
Subsurface Imaging™**

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**Limited Warranty, Limitations Of Liability And Restrictions**

Geophysical Survey Systems, Inc. hereinafter referred to as GSSI, warrants that for a period of 24 months from the delivery date to the original purchaser this product will be free from defects in materials and workmanship. EXCEPT FOR THE FOREGOING LIMITED WARRANTY, GSSI DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. GSSI's obligation is limited to repairing or replacing parts or equipment which are returned to GSSI, transportation and insurance pre-paid, without alteration or further damage, and which in GSSI's judgment, were defective or became defective during normal use.

GSSI ASSUMES NO LIABILITY FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR INJURIES CAUSED BY PROPER OR IMPROPER OPERATION OF ITS EQUIPMENT, WHETHER OR NOT DEFECTIVE.

Before returning any equipment to GSSI, a Return Material Authorization (RMA) number must be obtained. Please call the GSSI Customer Service Manager who will assign an RMA number. Be sure to have the serial number of the unit available

**FCC Notice (for U.S. Customers):**

This device complies with part 15, class F of the FCC Rules:

Operation is subject to the following conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation

**Warning:** Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Operation of this device is restricted to law enforcement, fire and rescue officials, scientific research institutes, commercial mining companies, construction companies and private parties operating on behalf of these groups. Operation by any other party is a violation of 47 U.S.C. § 301 and could subject the operator to serious legal penalties.

**Coordination Requirements**

(a) UWB imaging systems require coordination through the FCC before the equipment may be used. The operator shall comply with any constraints on equipment usage resulting from this coordination.

(b) The users of UWB imaging devices shall supply detailed operational areas to the FCC Office of Engineering and Technology who shall coordinate this information with the Federal Government through the National Telecommunications and Information Administration. The information provided by the UWB operator shall include the name, address and other pertinent contact information of the user, the desired geographical area of operation, and the FCC ID number and other nomenclature of the UWB device. This material shall be submitted to the following address:

Frequency Coordination Branch, OET  
Federal Communications Commission  
445 12<sup>th</sup> Street, SW  
Washington, D.C. 20554  
ATTN: UWB Coordination

(d) Users of authorized, coordinated UWB systems may transfer them to other qualified users and to different locations upon coordination of change of ownership or location to the FCC and coordination with existing authorized operations.

(e) The NTIA/FCC coordination report shall include any needed constraints that apply to day-to-day operations. Such constraints could specify prohibited areas of operations or areas located near authorized radio stations for which additional coordination is required before operation of the UWB equipment. If additional local coordination is required, a local coordination contact will be provided.

**Notice:** Use of this device as a wall imaging system is prohibited by FCC regulations.

**For U.S. Customers**

**Ground Penetrating Radar Coordination Notice And Equipment Registration**

**Note:** This form is only for Domestic United States users. The Federal Communications Commission (FCC) requires that all users of GPR who purchased antennas after July 15<sup>th</sup>, 2002 register their equipment and areas of operation. If you have purchased any of the antennas listed in question 6 after July 15<sup>th</sup>, 2002, you must fill out this form and fax or mail to the FCC.

Failure to do this is a violation of Federal law.

**1. Date:**

**2. Company name:**

**3. Address:**

**4. Contact Information [contact name and phone number]:**

**5. Area Of Operation [state(s)]:**

---Continued on next page.

**6. Equipment Identification:****Brand Name:** Geophysical Survey Systems, Inc.**Antenna Model No. (center frequency):** *CHECK all antennas being registered.*

<b>Model</b>	<b>Frequency</b>	<b>FCC ID</b>
52600	2.6 GHz	QF752600
4105	2.0 GHz	QF74105
5100B	1.6 GHz	QF75100
5101	1.0 GHz	QF75101
4108F	1.0 GHz	QF74108F
HandyScan	1.0 GHz	QF7HANDYSCAN
3101D	900 MHz	QF73101D
5103	400 MHz	QF75103
5103A	400 MHz	QF75103A
50400	400 MHz	QF750400
TerraVision	400 MHz	QF7TERRAVISION
5104	270 MHz	QF75104
5106	200 MHz	QF75106

**7. Receipt Date Of Equipment:****Fax this form to the FCC at:** 202-418-1944**Or****Mail to:**

Frequency Coordination Branch, OET  
Federal Communications Commission  
445 12<sup>th</sup> Street, SW  
Washington, D.C. 20554

ATTN: UWB Coordination

**Do not send this information to GSSI.**

**Certificate**

To Whom it may concern:

This is to certify that electromagnetic radiation emissions from transducers (antenna with transmitting and receiving electronics) manufactured by Geophysical Survey Systems, Inc. (GSSI) DO NOT constitute a safety or health hazard to operating personnel.

Emissions from GSSI transducers are below the 10mW/cm<sup>2</sup> (100W/m<sup>2</sup>) level specified by the United States Occupational Safety and Health Administration (OSHA) regulations

Paragraph 1910.97 states:

"For normal environmental conditions and for incident electromagnetic frequencies from 100 MHz to 100 GHz, the radiation protection guide is 10 mW/cm<sup>2</sup> (milliwatt per square centimeter) as averaged over any possible 0.1 hour period."

Emissions data using GPR SIR System-10, SIR-2, SIR-3, SIR-4, SIR-8, SIR-20, SIR-2000 and SIR-3000 (at the standard Pulse Repetition Frequency of 100 KHz) with the antenna Models listed and levels of Electromagnetic Radiation are specified herein:

Following is the average power density data at 5cm and wide band.

ANTENNA (MHz)	AVERAGE POWER DENSITY (W/m <sup>2</sup> @ 5 cm)	OSHA SPEC. (W/m <sup>2</sup> )
100	Less than 0.0001	100
200	Less than 0.0001	100
300	Less than 0.0001	100
270	Less than 0.0001	100
400	Less than 0.0001	100
500	Less than 0.0001	100
900	Less than 0.0001	100
1000	Less than 0.0001	100
1600	Less than 0.0001	100
2600	Less than 0.0001	100

GEOPHYSICAL SURVEY SYSTEMS, INC.

Alan E. Schutz  
Engineering Director

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## Table Of Contents

<b>Model 5103A Antenna .....</b>	<b>1</b>
System Setup - Standard Settings .....	1
Signal Position.....	2
Gain Check.....	2
Specifications .....	2



## Model 5103A Antenna

The Model 5103A antenna has greatly improved resolution performance over previous GSSI mid-frequency antennas, such as the Model 3105 (300 MHz). The Model 5103A can be used in continuous, survey wheel or static stacking modes.

### System Setup - Standard Settings

#### Preset Settings:

Range/Depth is approximately 2.5m (8 ft) assuming a dielectric constant of 9.

Setup Mode: Manual

System Run Mode: Survey Wheel (recommended) or Continuous

Range: 50 ns

Number of Gain Points: 5

Vertical Low Pass Filter: 800 MHz

Vertical High Pass Filter: 100 MHz

Samples per Scan: 512

Bits per Sample: 16

Scans per Second: Set to 120 (recommended).

#### Deep Profiling:

For approximately 5 m (16 ft) with a dielectric of 9.

Setup Mode: Manual

System Run Mode: Survey Wheel (recommended) or Continuous

**Range: 100 ns**

Number of Gain Points: 5

Vertical Low Pass Filter: 800 MHz

Vertical High Pass Filter: 100 MHz

Samples per Scan: 1024

Bits per Sample: 16

Scans per Second: Set to 120 (recommended).

## Signal Position

Place the antenna on the ground and use the Automatic Signal Position selection. The system will servo and place the direct coupling pulse at the top of the time range window.

To test that you have the correct position, raise the antenna off the ground and you will observe on your system that the antenna transmit pulse will separate from the reflection from the ground. The higher that you raise the antenna, the further apart will be the two pulses.

To assure that the direct coupling pulse (time zero) is recorded the user should place the signal Position servo in the manual mode. The signal should then be moved down in the time range window until the entire surface pulse is visible and there is some 'dead time' or flat trace visible above the direct coupling pulse in the time range window.

## Gain Check

The surface pulse should be about 2/3 the width of the screen. If it is greater, reduce the Gains manually. If the signal appears too small you can manually increase the Gains, but the first gain point should never exceed 10dB, the last gain point should not exceed 65dB.

## Specifications

Center frequency: 400 MHz

Pulse duration: 2.5 ns

Depth of penetration: 0-16 ft depending on dielectric permittivity

Size of sensor: 12×12×6.5 inches (30×30×17cm)

Weight of sensor: 14 lbs (6.4 kg)