

# Model 5104 Antenna

## System Settings and User Notes



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Published by Geophysical Survey Systems, Inc.

13 Klein Drive

North Salem, New Hampshire 03073-0097

Printed in the United States

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

This device complies with part 15 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, and construction companies. 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.

(f) The coordination of routine UWB operations shall not take longer than 15 business days from the receipt of the coordination request by NTIA. Special temporary operations may be handled with an expedited turn-around time when circumstances warrant. The operation of UWB systems in emergency situations involving the safety of life or property may occur without coordination provided a notification procedure, similar to that contained in CFR47 Section 2.405(a)-(e), is followed by the UWB equipment user.

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

## Model 5104 Antenna

The Model 5104 antenna has greatly improved resolution performance over previous GSSI mid-frequency antennas, such as the Model 3105 (300 MHz). The Model 5104 can be used in continuous, survey wheel or static stacking modes. The Model 5104 has a center frequency of 275 MHz when measured in air.

### System Setup - Standard Settings

**Shallow Profiling:** Range/Depth is approximately 5m (15 ft) assuming a dielectric constant 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: 30 MHz

Samples per Scan: 512

Bits per Sample: 16

Scans per Second: Set to maximum scan rate allowed by the SIR System used..

**Deep Profiling:** For approximately 8 m (25 ft) with a dielectric of 9.

Setup Mode: Manual

System Run Mode: Survey Wheel (recommended) or Continuous

Range: 175 ns

Number of Gain Points: 5

Vertical Low Pass Filter: 800 MHz

Vertical High Pass Filter: 30 MHz

Samples per Scan: 1024

Bits per Sample: 16

Scans per Second: Set to maximum scan rate allowed by the SIR System used..

## 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: 275 MHz

Pulse duration: 3.6 ns

Depth of penetration: 0-25 ft depending on dielectric permittivity

Size of sensor: 17.5×17.5×7.5 inches (44.5×44.5×19cm)

Weight of sensor: 19 lbs (8.6 kg)