

Model 5100 Antenna

System Settings and User Notes



We Provide Complete Survey Solutions

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FCC NOTICES:

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 12th 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.

Model 5100 Antenna

The Model 5100 antenna has greatly improved performance over previous high frequency antennas. Not only is the frequency higher, but the antenna has the ability to see objects at very close distances. The Model 5100 can only be used with a “deadman” switch with the SIR-20 or SIR-3000 control units. These systems are designed to limit the antenna at or below its maximum rated pulse repetition frequency of 200 KHz.

System Setup - Standard Settings

Note: You must follow these setup instructions exactly to use the Model 5100 antenna. Positioning of the signal will be the last step in the process.

Setup Mode: Manual

System Run Mode: Survey Wheel (recommended) or Continuous

Range: 6-12 ns

Number of Gain Points: 3

Vertical Low Pass Filter: 3000 MHz

Vertical High Pass Filter: 400 MHz

Samples per Scan: 512

Bits per Sample: 16

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

Signal Position

Place the antenna on the concrete floor and use the Automatic Signal Position selection. You may need to try this 2 to 3 times to get the system to lock on to the surface pulse. If after 3 tries the surface pulse is not in the signal window, point the antenna into the air and again try the Automatic Position.

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.

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.

Data Collection

Collecting data using the survey wheel with the standard settings

System Run Mode: Survey Wheel

Number of Scans per Meter: 80 (24 scans per foot) or higher

Special settings used for collecting data on bridge decks

Setup Mode: Manual

System Run Mode: Survey Wheel

Range: 6 ns (unpaved), 10 ns (paved)

Number of Gain Points: 1

Vertical Low Pass Filter: 3000 MHz

Vertical High Pass Filter: 250 MHz

No Horizontal Filters

Samples per Scan: 512

Bits per Sample: 16

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

Signal Positioning: Use the same procedure as in standard setup

Set the Scans per Meter parameter to 80 scans per meter (24 scans per foot)

Calibrate the survey wheel before collecting data

Note: See Bridge Assessment Manual before proceeding.

Specifications

Center frequency: 1500 MHz

Pulse duration: 0.7 ns

Depth of penetration: 0-18 inches depending on type of concrete

Size of sensor: 1.5 x 4 x 6.5 inches (3.8 x 10 x 16.5 cm)

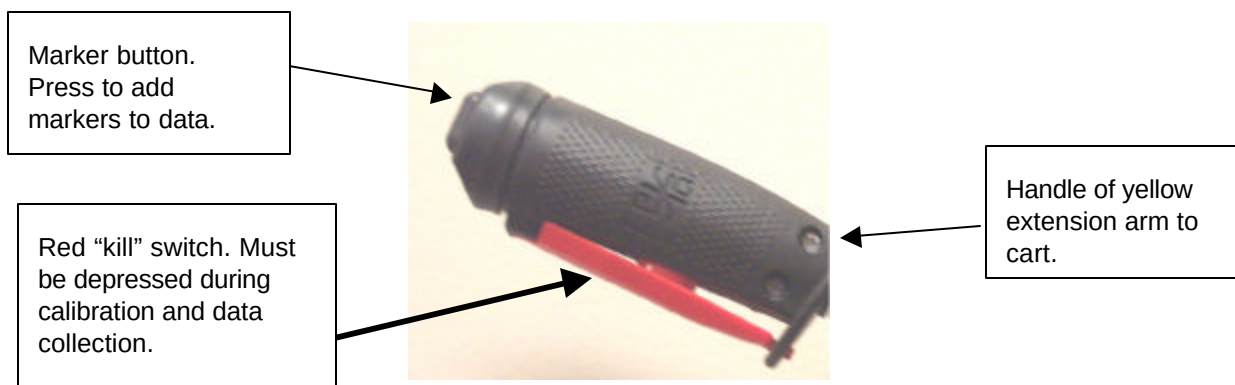
Marker/Kill Switch

There are two standard methods of operation for the 5100. Both use a cart, but one uses a long yellow handle to allow data taking while walking. Both of these methods use a multi-function marker button. The cart is shown below.



- The green button on the cart must be pressed continuously during calibration and operation.
- Releasing the button for less than one second will place a marker in the data.
- During data acquisition, releasing the button for two seconds will place the system in the Standby mode. In this mode, momentarily releasing the button will restart data collection.
- Releasing the button for longer than 10 seconds will close any open files and turn off the transmitter. To resume, the data acquisition sequence must be repeated.

A long yellow handle may be added to the cart. This has a multi-function switch at the top end.



- If you are using the long yellow handle attached to the StructureScan cart, you will need to keep the red "kill" switch on the handle depressed at all times.
- Releasing the handle for 2 - 10 seconds pauses data collection. Data collection that is in Pause mode can be restarted by briefly releasing the "kill switch" or pressing the marker button.
- If the "kill" switch is released for more than 10 seconds, the file will automatically be closed.
- Markers are added to the data by pressing the marker button on the end of the handle, or by quickly releasing and depressing the kill switch.