

GCB-3070

Datasheet



GCB-3070 is part of the Geoscanners Smart Antenna series. It is a dual frequency smart antenna that provides native two channel GPR data collection. By using a smart antenna, in particular the GCB-3070 antenna, the GPR operator can collect data from both shallow and deep regions in one go. This way of collecting data reduces the time for the data acquisition by half when compared to single antenna operations. Furthermore, the collected data has ideally matched positioning, making it quite easy to observe the correlation between the information visible in the two channels.

GCB-3070 consists of a dedicated 300MHz antenna channel, 700MHz antenna channel and an integrated channel multiplexer. The performance of the 300MHz channel is comparable to the single channel Geoscanners GCB-300 antenna, with an improvement in the top resolution and slightly less penetration due to the extended distance between the transmitter and receiver.

The 700MHz channel results are comparable the Geoscanners GCB-700 antenna. The modifications in the design of the modern GCB-3070 antenna compared to GCB-700 resulted in a much wider frequency bandwidth, which improves the data even more.

Just like the rest of the smart antennas, GCB-3070 uses an advanced communication protocol when connected to a radar control unit. Through this protocol, the smart antenna will set its own default settings and do a system diagnostic check upon each start, allowing for easier usage. Because of the advanced technology and easy solutions for the user, the smart antennas can only be used with the Akula 9000C or newer radar control units.





Area of Application

- Utility detection
- Shallow engineering
- Environmental applications
- Forensics
- Close to surface void detection

Mechanical and Environmental Specifications

| | |
|----------------------------------|--|
| Dimensions LxWxD (mm/inches) | 472x330x177 / 18.5x13.0x6.9 |
| Weight (kg/pounds) | 4.35 / 9.6 |
| Fastening points LxW (mm/inches) | 250x180 / 9.84x7.08 |
| Ingress Protection | IP65 |
| Operating Temperature (°C / °F) | from -25 up to +40 / from 14 up to 104 |
| Relative Humidity (%) | 99 (NC) |

Electrical Specifications - General

| | |
|-------------------------------------|---------------------------|
| Antenna Type | Quarter Wavelength Bowtie |
| Shield Type | Top and Side Shield |
| Survey Wheel Output Voltage (Volts) | 5.01 |

Electrical Specifications - 700MHz Channel

| | |
|--|-----------|
| Distance between the TX and RX (mm/inches) | 80 / 3.14 |
| Feed point impedance (Ohms) | 269 |
| Transmitted Pulse Amplitude (Volts) | 128 |
| Receiver Sensitivity (µVolts) | 14 |
| Antenna Bandwidth (at 10dB) | 106% |
| Antenna Center frequency (MHz at 10dB BW) | 675 |

Electrical Specifications - 300MHz Channel

| | |
|--|-------------|
| Distance between the TX and RX (mm/inches) | 300 / 11.81 |
| Feed point impedance (Ohms) | 328 |
| Transmitted Pulse Amplitude (Volts) | 100 |
| Receiver Sensitivity (µVolts) | 14 |
| Antenna Bandwidth (at 10dB) | 95% |
| Antenna Center frequency (MHz at 10dB BW) | 315 |

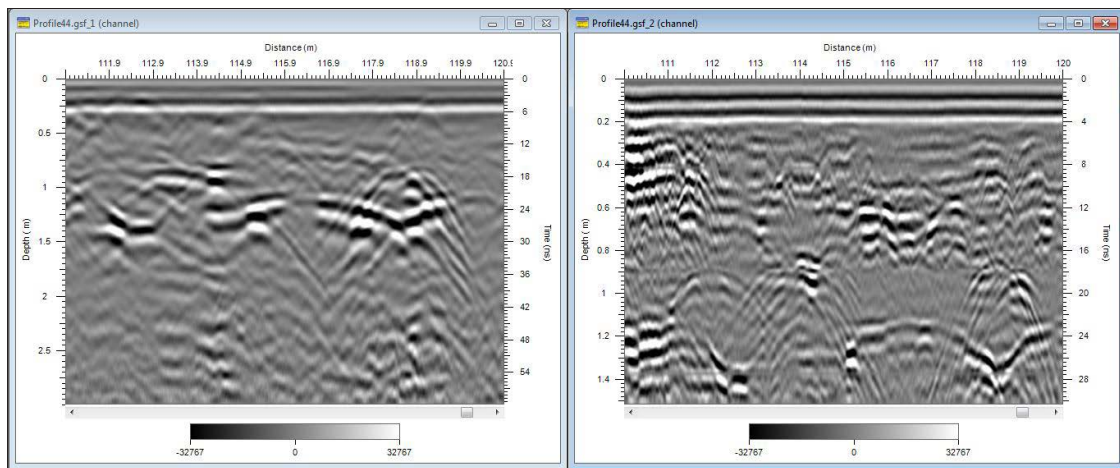
Accessories*

- SVC-820 4-wheel survey cart
- S37 protective skid plate with belts
- CTR-E907 smart antenna control cable

*Accessories are not included

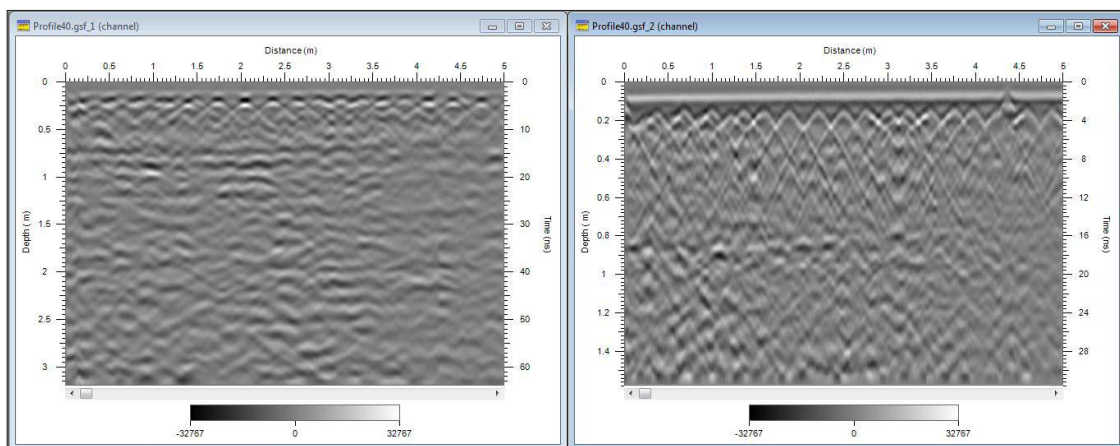
| Recommended Settings | | |
|---|---------------------|---------------------|
| | 700MHz Channel | 300MHz Channel |
| Pulse repetition Frequency, PRF (kHz) | ≥100 | ≥100 |
| Scan Rate, Traces/Second | 100 | 100 |
| Range (ns), (depends on soil penetration) | 7-35 | 40-100 |
| Low Pass Filter Cut-Off Frequency (MHz) | 1400 | 600 |
| High Pass Filter Cut-Off Frequency (MHz) | 350 | 150 |
| Gain | Adjust to 75% Swing | Adjust to 75% Swing |

GCB-3070 has many advantages compared to other antennas when used for utility or layer mapping surveys. The collected data will discover the deeper targets in the first channel at the same time as it determines, with great detail, the shallower targets in the second channel. This is well demonstrated in Image 1. The data from second channel nicely depicts a 20 cm layer of compacted snow and ice laying on top of the road, while the first channel shows deeper layers and targets all the way to 3 meters.



1. Utility and layer mapping on a snowy road.

Collecting data on concrete slabs often requires information about the concrete slab, area close to the bottom of the concrete slab and area deep beneath it. Here the combination of high and low frequency is necessary, because each of those requirements focus on a different type of targets and on different depths. By using a GCB-3070 antenna, one can easily interpret the rebar reinforcement position and conditions on contact with the slab and ground beneath it, while the lower frequency part of the antenna collects the information about the deeper targets.



2. Sample data collection over a concrete floor with rebars.

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