FLEX MODE: BEST PRACTICES & FAQ

WHY DID GSSI CREATE FLEX MODE?

We designed Flex Mode as a quick and easy rough-out tool for enhancing your GPR workflow. Flex Mode will help in any situation, but our goal was to focus on two specific conditions:

1. **Congested, target-rich areas:** Traditional 2D scanning can be challenging to interpret when there are targets at multiple depths, especially when they are curved or angled relative to the scan area. Flex Mode streamlines 3D GPR collection by delivering rapid results without having to spend time collecting data on a fixed grid.
2. **You need report content your customers can understand:** Clients are increasingly demanding more realistic GPR deliverables, and non-specialists find 2D profiles difficult to read. Flex Mode generates images and deliverables that anyone can understand.

Q: When is the best time to use Flex Mode?

A: Before or after a 2D mark out. Perform a Flex Mode scan before a 2D mark out to understand the environment you are scanning, and to assess the complexity of the scan area. Use Flex Mode after the mark out to validate your 2D interpretations and to look for any additional targets. Don't forget to collect a few Flex Mode screen grabs for your report!

sales@geophysical.com
www.geophysical.com
Geophysical Survey Systems, Inc.

Reach us at
800.524.3011

FLEX MODE FAQ

Q: How does Flex Mode work?

A: Flex NX combines vision system coordinates and 2D radar data to build and help you visualize subsurface targets within a 3D volume. Data visualization in Flex Mode is comparable to methods used in the medical imaging industry.

Q: What is the purpose of Flex Mode calibration, and how does it affect data quality?

A: Flex NX's vision system requires a high level of accuracy to assemble and display an accurate and high-quality image. For the vision system to "know" where it is **in space** it must first determine where it is relative **to space**. The vision system calibration is very brief but an important step in ensuring position accuracy. The vision system must be calibrated at the beginning of each Flex Mode scan.

Q: How big an area can Flex Mode scan?

A: Flex Mode is capable of collecting and imaging within an area that is 120 cm x 60 cm (4 ft x 2 ft).

Q: Can I perform a mark out with Flex Mode?

A: No, Flex Mode was designed as a rough out tool to provide a quick and easy way to visualize what is below the surface before and/or after 2D scanning.

Q: Can I use a remote display when collecting or opening data in Flex Mode?

A: No, remote view is for 2D view only.

Q: Does Flex Mode replace traditional 2D scanning?

A: No, Flex Mode is a validation method designed to augment, but not replace, 2D scanning techniques.

Q: Does Flex Mode replace traditional grid-based 3D?

A: No, Flex Mode is meant to be an efficient method for generating high quality deliverables that are easy to understand. Traditional grid-based scanning is more laborious and time consuming though it does have advantages in certain situations.

GSSI

Geophysical Survey Systems, Inc.
40 Simon Street
Nashua, NH 03060-3075 USA

sales@geophysical.com
www.geophysical.com

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Q: How is Flex Mode different from traditional grid-based 3D?

A: Flex Mode doesn't use a fixed grid for positioning. Grid-based data collection is prone to user error as it relies on the user to be able to collect straight lines with specific start and end points. Additionally, Flex Mode uses both antennas (standard and cross-polarized) and does not require the data to be collected in two directions.

Q: Do I need to use a grid layout to perform a Flex Mode scan?

A: No, Flex Mode does not require grid paper or a grid layout. Simply start Flex Mode collection in the center of your scan area (up to 120 cm x 60 cm (4 ft x 2 ft) area) and cover the area of interest with parallel passes.

Q: How many scans do I need to take to make a good image?

A: Flex Mode collects data as one continuous scan, regardless of direction. There is no minimum number of passes needed to create an image, though when covering larger areas you should collect tighter passes for a better image. We recommend a maximum of 5 cm (2 in) between passes for general scans, and a maximum of 2.5 cm (1 in) for capturing detailed images.

Q: How accurate is a Flex Mode image?

A: Flex Mode's accuracy is dependent on the vision system's ability to monitor its position. The vision system does measure and monitor its position confidence. Flex NX will stop collecting data if confidence drops below a level at which accuracy can be guaranteed.

Q: What is the maximum scanning depth for Flex Mode?

A: 30 cm (1 ft).

Q: Do I have to scan in a specific direction?

A: For the best results, scan forward to backward using a back-and-forth motion. Flex NX's rear antenna is rotated 90 degrees from the front antenna, so you do not have to scan in two perpendicular directions to image a reinforcement grid.

Q: How long does it take to collect data in Flex Mode?

A: A thorough Flex Mode collection within a 120 cm x 60 cm (4 ft by 2 ft) area typically takes about a minute or two to collect and display the 3D volume.

Q: What happens if I pick up Flex NX during the scan?

A: Flex NX will detect that it has been lifted, but will continue scanning. We recommend keeping Flex NX's wheels on the surface until scanning is completed, and always tapping the stop icon when finished. It is not possible to add additional data once Flex NX has stopped collecting.

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Q: Are the wheels used during a Flex Mode Scan?

A: Yes, the wheels make it easy to roll Flex NX back and forth and to achieve relatively even spacing and coverage.

Q: Are there limitations with where and how Flex Mode is used?

A: Yes, to accurately track its position Flex NX requires that the vision system be unobstructed. When possible, avoid reflective surfaces and dark and small areas for best results.

Q: Does Flex Mode work on walls, ceilings, and inclines?

A: Yes, Flex Mode can work on walls, ceilings and inclines but the surface should be flat.

Q: Can Flex Mode see everything that can be seen in 2D?

A: Flex Mode provides a different way to visualize the same radar data seen in 2D scanning. Since both 2D and Flex Mode imaging techniques have strengths and weaknesses, there will be some cases when one data set looks better than the other based on subsurface targets and conditions.

Q: Will Flex Mode improve over time?

A: Yes, Flex Mode will continue to be improved over time. As new and improved versions become available, updates will be posted on the Flex NX support site at: https://www.geophysical.com/support/flexnxsupport

Q: Will I be able to open Flex Mode scans in RADAN®?

A: No, you cannot open Flex Mode scans in RADAN. We are evaluating options for viewing Flex Mode data off device.

Q: What can I do with Flex Mode data?

A: Flex Mode's Top Down View provides slicing options for visualizing targets at varying depths, and gain adjustments for optimizing data. In 3D Volume View a fully rotatable 3D cube can be viewed from any angle, with a threshold slider for accentuating targets of interest. Screen grabs can be taken at any time, and these will be included in file transfers.

Q: Does Flex's vision system save images from the environment?

A: No, Flex NX does not save pictures or footage at any time. Flex NX only saves localized position information required for 3D imaging.

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