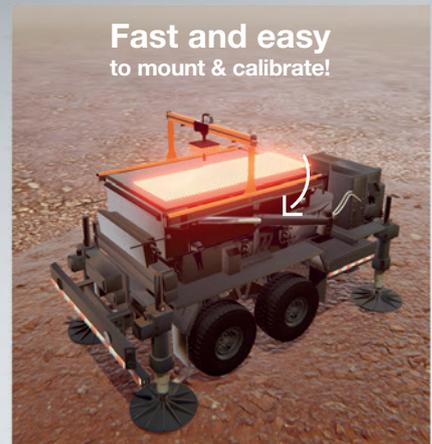
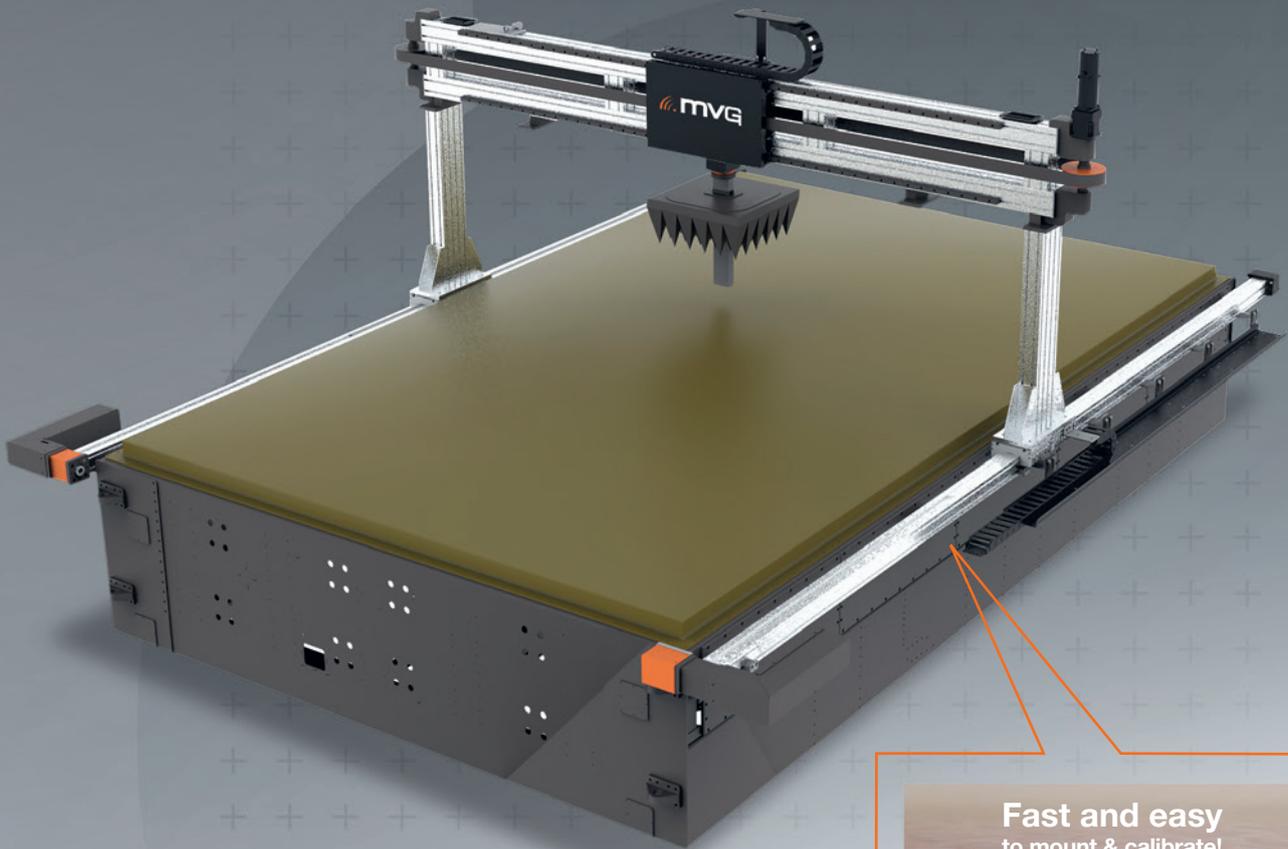




# Bolt-On Scanner

## Modular Portable Scanner

A fast, lightweight, and accurate solution  
for on-field active phased array calibration



## + General Overview

When a radar requires recalibration, it needs a complex operation involving the dismantling of the asset and its transport to a distant near-field measurement facility.

This process often takes weeks, resulting in substantial downtime, high transportation costs, and increased operational risk.

## + The Solution: In-Situ Re-calibration

To avoid the need for facility transport, MVG has created an advanced solution: **the Bolt-on-Scanner**. This modular, portable system brings fast, lightweight, and accurate active phased array calibration directly to the field.

This approach transforms a previously high-risk, heavy-logistics event into a routine in-situ maintenance task, ensuring that measurement accuracy does not come at the expense of asset availability.



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## SOLUTION FOR

- Active phased array calibration on the field
- Pulsed and continuous wave testing

## PRODUCT CAPABILITIES

### Technology

- Near-field / Planar

### Features

- X-axis travel: Configurable to antenna dimensions
- Y-axis travel: Configurable to antenna dimensions
- Z-axis: Configurable to frequency needs
- Roll axis:  $\pm 90$  deg
- Repeatability: 0.05 mm
- Accuracy:  $\pm 0.5$  mm RMS
- Side rails for the x-axis can be installed as a permanent integral part of the radar's structure
- Planarity: 0.2 mm
- Scan Speed: 100 mm/sec

## MEASUREMENT PROBE



## + ADVANTAGES



### Maximized Mission Readiness (Uptime)

By eliminating the transport loop to a facility, you reduce downtime from weeks to hours. The radar stays on-site, in position, and ready to re-engage immediately after calibration.



### Tactical Agility

No longer need to plan months in advance for transporting assets out of the front lines. Calibration becomes an on-demand capability, ensuring peak performance exactly when and where it is needed most.



### Drastically Reduce Logistical Costs

It decreases the heavy costs associated with specialized heavy transport and external facility fees. The Bolt-on-Scanner converts a high-CAPEX/OPEX event into a cost-efficient field operation.



### Risk Mitigation

Once sensitive equipment is moved, there is a significant risk of damage during handling and transit. "On-site" testing ensures the system is calibrated in its actual operating configuration and environment, effectively mitigating the risks of re-installation errors or transit damage.

# + System Overview

## X-AXIS

The X-axis is implemented as a dual-drive gantry system, using two parallel drive trains operating under synchronized electronic control.

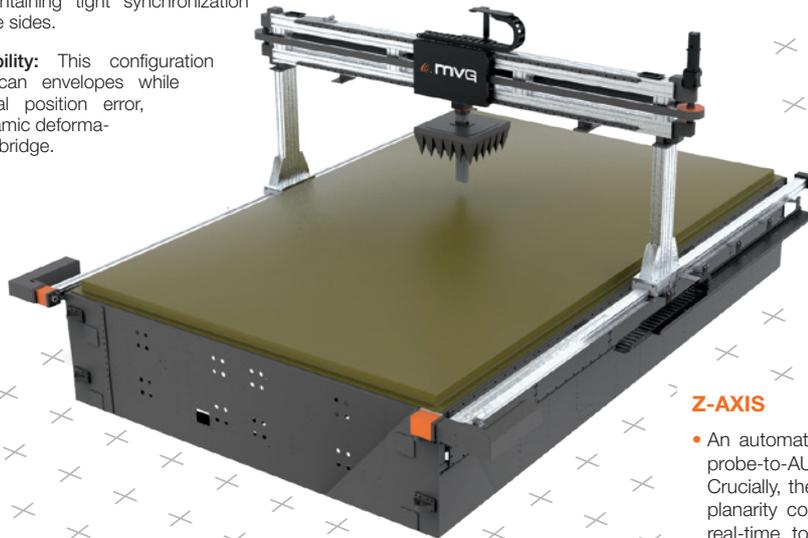
The gantry configuration provides:

- **Structural Parallelism:** By driving the gantry from both sides, the system minimizes racking and angular misalignment, helping maintain the Y-axis bridge perpendicular to the scan path throughout operation.
- **High Dynamic Stiffness:** The dual-drive arrangement distributes drive force across both sides of the structure, enabling high-repeatability motion of large moving frames while maintaining tight synchronization between both drive sides.
- **Large-Area Stability:** This configuration supports large scan envelopes while reducing structural position error, vibration, and dynamic deformation of the moving bridge.

## Y-AXIS

The Y-axis is the secondary scanning stage mounted orthogonally to the X-gantry.

- **Optimized Sampling Speed:** Designed for high-speed bi-directional movement, the Y-axis acts as the primary data acquisition stroke. It utilizes low-friction linear bearings and high-precision drive mechanisms to minimize settling time between samples
- **Orthogonal Integrity:** Hard-mounted to the stable X-axis gantry, the Y-axis maintains a rigid 90-degree relationship to the X-plane, ensuring a perfectly rectangular sampling grid—critical for accurate Fast Fourier Transform (FFT) processing of RF data



## Z-AXIS

- An automated linear stage that controls the probe-to-AUT (Antenna Under Test) distance. Crucially, the Z-axis is often utilized for active planarity correction, dynamically adjusting in real-time to compensate for any structural deviations and maintaining a perfectly flat scan plane.

# + Executive ROI Summary

Category	Traditional Method (Return-to-Base)	Portable PNF (On-Site)	Direct ROI Impact
Logistics	\$50k+ (Shipping/Insurance)	\$2k (Scanner Travel)	95% Reduction
Facility	\$10k/day (Chamber Rental)	\$0 (Hangar/Field)	100% Avoidance
Downtime	14–30 Days	1–2 Days	90% Faster Turnaround
Risk	High (Transit/Handling)	Minimal (In-Place)	Significant Liability Drop

