



Geodetic Systems

# V-STARS/N

Picture-Perfect Measurement™

The fastest,  
most accurate,  
single-camera  
photogrammetric  
3D measurement system



# V-STARS/N - What does it do (for me)?

The **V-STARS/N** systems from Geodetic Systems, Inc. (GSI) provide fast, highest-accuracy 3D coordinate measurement using a technique called “photogrammetry” where multiple pictures of a targeted object are taken from different locations, typically using a single, high-resolution camera that is hand-held by an operator.



Photogrammetry has several compelling unique capabilities that are unavailable from other widely used 3D measurement technologies such as laser trackers and measuring arms, namely:



**Immune to vibration and movement** so it can be used where other technologies cannot

**Works from lifts, cranes and unstable platforms** so it can see and measure what others cannot

**Fast picture taking and no warm-up time** so measurements are quick and production downtime is minimized

**Target measurement** so repeat measurements are extremely fast and easy, making it ideal for deformation, assembly/disassembly, and repeatability studies

**Extremely portable** – Equipment is small and lightweight so it can go places other cannot, and can be stored in two carry-on cases so it can safely go with you anywhere.

These capabilities, together with **V-STARS/N's** industry-leading speed, accuracy, ruggedness and repeatability make it well-suited for a wide variety of applications in many industries. Typical applications include:

## Part and tool inspection

On unstable floors and from lifts with minimal production downtime. Easy, accurate reliable measurement of reference and details using Feature Targets (FTs)

## Antenna inspection

Day or night, hot or cold, of practically any size or shape (including back structure, sub reflectors, etc). Fast repeat measurements under varying conditions and orientations.

## Automotive periodic tool inspection and troubleshooting

During breaks and even on moving lines. Ideal for deformation and repeatability studies and for troubleshooting problems throughout production.

## Wind energy tower flatness, blade and spar measurements

In the factory (no lifts or ladders needed for tower flatness) or in the field (lifts, cranes often needed), or even on the water.

## Shipbuilding fit-up, alignment, piping and inspection

Outside/inside and even on the water



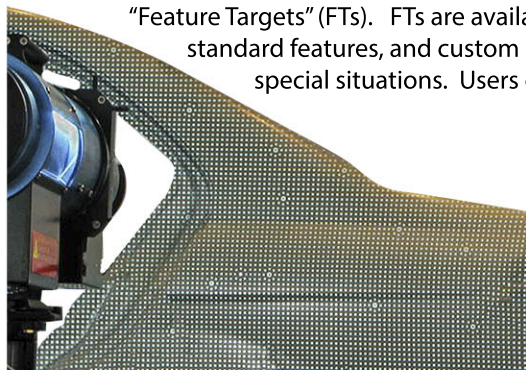
## Heavy engineering bridge blocks, part fit-up and conformance

Practically any size, in any conditions

# How does it work? - It starts with targeting

With the **V-STARS/N** systems, measurements are fast and easy. From our small, lightweight, rugged cameras that allow for simple “point and shoot” picture taking to our **V-STARS** software that provides fast, reliable, fully automatic processing using our proprietary “No-Click” feature, we do it all - quickly, reliably and accurately.

To achieve the system’s high accuracy and reliability, small, thin, inexpensive targets are applied to the points of interest on the object. Numerous types of other targets are also available for measuring various features, including GSI’s proprietary “Feature Targets” (FTs). FTs are available from GSI for many standard features, and custom ones can be made for special situations. Users can easily make their own FTs.

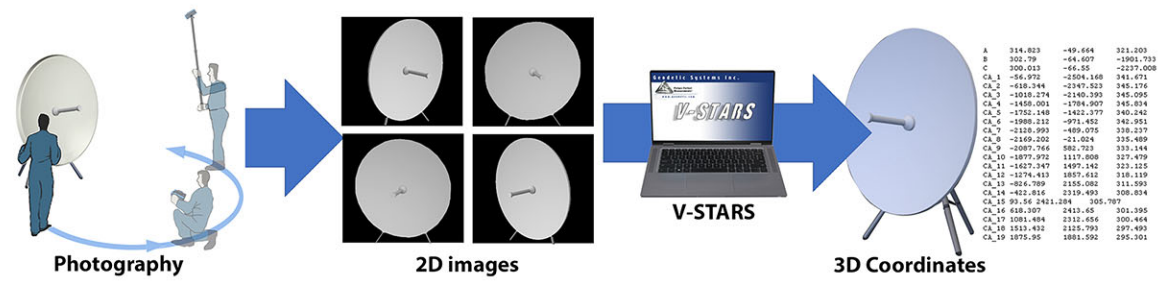


All targets are illuminated by a small, low-power flash system which provides consistent illumination whether taking pictures in low or high ambient light conditions varying from complete darkness to outside in full sunlight.

High-accuracy targetless measurement is also possible using our “Pro-Spot” target projector which simultaneously and instantaneously projects thousands of light dots on the object for measurement.

# How does it work? - It ends with XYZs

Photography is fast and easy. No operator adjustments are needed. The camera's optical viewfinder, tiltable LCD monitor, or optional lasers can all be used for aiming. Most measurements take 10 to 100 pictures but the number of pictures is practically unlimited (thousands).



There is no need whatsoever to hold the camera steady. As mentioned, pictures can be taken from lifts, ladders, cranes, etc. if needed. Even our optional "Periscope", a lightweight, telescopic camera extender is available for convenient floor-to-ceiling (and higher) picture taking. Pictures are stored on a flash memory device for later processing or can be transferred wirelessly as pictures are taken for immediate processing.

Pictures are quickly and automatically processed using GSI's industry leading **V-STARS** software to produce the 3D measurements of the desired points of interest. Using our proprietary "No-Click" process, measurements can be processed as soon as the flash memory device is inserted in the PC with no other operator involvement needed. Statistics and visualization tools provide intuitive feedback about the progress. Most measurements are completed in a minute or two thanks to our fast techniques and parallel processing. Points can be visualized and analyzed in **V-STARS** or exported to 3rd party packages for further analysis and processing.

## Why V-STARS?

To provide maximum capability and flexibility, three **N-series** camera models are available, called **Platinum (Pt)**, **Gold (Au)** and **Silver (Ag)**. They differ primarily in price, resolution/accuracy and size/weight. The cameras share many common features, including:



### Custom, Calibrated Camera and Lens 1

GSI's proprietary methods and advanced calibration techniques produce a rugged camera and lens that achieves the highest accuracy under all conditions.

### Ergonomic, Rugged, Protected

Other custom, proprietary features include: A rugged, but comfortable padded handle 9 for easier handling and better camera protection, A unique "Lens Guard" 1 with a captive, self-closing cap 3. Together they surround the lens (without touching it) thereby protecting the most critical (and vulnerable) part of the system A "Camera Shield" 2 that protects the camera and restricts access to unneeded features.



- 1 Custom Calibrated Lens
- 2 Lens Guard / Camera Shield
- 3 Self-closing Lens Cap
- 4 Integrated Flash Au Ag
- 5 External Flash Pt
- 6 Optional lasers Pt
- 7 TTL Viewfinder
- 8 LCD Screen
- 9 Comfort Handle

### Small but powerful flashes

With GSI's advanced materials and techniques, small, lightweight flashes 4 5 can illuminate the targets for practically all situations.

### Easy "Point and Shoot" operation.

Cameras are ready to take pictures straight out of the box. GSI optimizes camera focus and aperture, so no adjustment is needed or possible. GSI's advanced techniques enable the camera to be used at ranges from 1 to 100 meters and are a key to achieving the system's high accuracy. With the flash and shutter preset for most situations the operator only needs to aim the camera (using the optical TTL viewfinder 7, LCD monitor 8, or optional aiming lasers 6) and take pictures for true "point and shoot" operation.

### Extremely Portable (even with spare parts and even with an optional backup camera)

Even the most rugged equipment can fail or be damaged, lost or stolen. That is why spares are included for everything except the camera. And there is even an option for a fully functioning backup camera which can be used immediately. All the critical **V-STARS/N** system's components (camera, laptop computer, all accessories – including spares and even including the backup camera) are stored in two small cases that can be hand-carried aboard a plane.

# V-STARS/N Optional Accessories



## Bright Light Kit

For use outdoors in shade or sunlight. Includes larger, more powerful flash and two tested and certified Neutral Density filters to reduce light (8x for shade, 64x for sun).

PART ID: BRIGHT-LIGHT-KIT

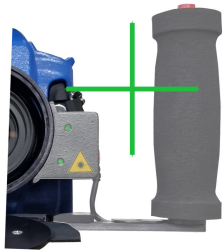


## 1.3M Periscope

Telescoping 4-section pole that extends camera reach. Can even be used for floor-level shots. Dual level switch in base activates optional aiming laser and takes pictures. Tilttable camera screen can also be used for aiming. Has ball mount for aiming, rolling camera. Length 0.5 to 1.3 meters (20 to 52"). Fits in camera case.



PART ID: PERISCOPE-1.3M



## Aiming Laser

Projects a bright, green cross that covers the camera's Field-Of-View (FOV). Blinks for better visibility. Includes handle with dual-level switch for activating laser and taking pictures. Only available for Platinum system.

Pt PART ID: N-LASER-KIT

## WiFi Kit

Provides fast, secure image transmission to system computer for immediate processing in **V-STARS**. 802.11ac wireless with WPA2-FSK encryption. Not available for Silver system.



PART ID: N-WIFI-KIT

## Back-up Camera

Spare parts are provided with the system for everything, except the camera. However, for a small fraction of the system price, a backup camera is available. It is a fully functional camera identical in features and specifications to the original camera. It is immediately useable if the original camera is lost or broken. It can even be stored in the system case along with the original camera.



PART ID: BACK-UP



Fits in case

# V-STARS/N Specifications

Specification differences between the different systems have been **bolded** for clarity.

Feature	Platinum - Pt	Gold - Au	Silver - Ag
Accuracy <sup>1</sup>	5µm + 4µm/Meter	<b>5µm + 5µm/Meter</b>	<b>5µm + 6µm/Meter</b>
Sensor	45 Million Pixels (MP)	<b>24MP</b>	24MP
Field of View (FOV)	Ultra-wide 74° x 53°	Ultra-wide 74° x 53°	<b>Very-wide 67° x 48°</b>
Rated Shutter life	200,000 pictures	<b>150,000 pictures</b>	<b>100,000 pictures</b>
Weight <sup>2</sup>	1.8kg / 4.0lbs	<b>1.4kg / 3.1lbs</b>	<b>1.0kg / 2.3 lbs</b>
Standard Flash	External, Add-on	<b>Built-in, Pop-up</b>	Built-in, Pop-up

## Optional Accessories Can be added at any time. Easy user installation

Wireless Image Transfer	802.11.ac	802.11.ac	<b>Not Available</b>
Aiming Lasers	Blinking green cross	<b>Not Available</b>	Not Available
Backup camera	Same specification as primary camera, can be used immediately		
Periscope camera extender	1.3M/52" reach for floor to ceiling picture taking		
Bright Light Kit	For taking pictures outside in shade or sunlight		

<sup>1</sup> Conditions for meeting accuracy specification:

- 1) Targets are of acceptable size and good quality.
- 2) Each target is seen in at least eight pictures with good geometry.

<sup>2</sup> Weight in Standard configuration - Camera with lens, standard flash, battery, handle, and all protections (Lens Guard, Camera Shield)

ISO 9001:2015  
CERTIFIED COMPANY



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