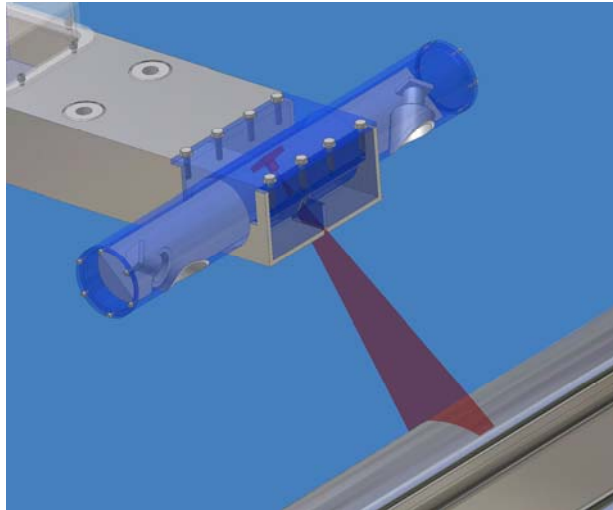


## Vista OpenGeo™



**Vista Instrumentation LLC** has designed and developed the next generation of Rail Track Geometry Measurement equipment which brings better performance, lower cost, simplicity and reliability to the industry.

Based on highly integrated hardware which enables extremely fast rail image processing using special firmware programmed into a gate array chip (FPGA) this system enables non-contact measurement of railroad track to levels not possible previously.

Despite performance that surpasses legacy systems, The OpenGeo™ system also achieves better (low) power consumption, smaller size, lower cost, better reliability and extreme flexibility in application not previously possible.

# VISTA INSTRUMENTATION LLC

## Vista OpenGeo™ Track Geometry Measuring System

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### **System Features:**

- Compact, lightweight and robust design in a very competitively priced package.
- Open Source design and software gives the customer total control over all aspects of system operation and data acquisition.
- High speed operation, genuine 250mm data samples at a vehicle speed of 350km/hour.
- Low power usage, less than 40 watts at 12 or 24 volts.
- All components designed to work in a high vibration hostile environment.
- GPS location capability built in.
- Wi-Fi (802.11b/g) capability is built in and provides the ability to remotely monitor system operation and download data.
- Lasers have failsafe safety interlocks built in.
- Dual tachometer interface for reliability and more accurate distance measurement if required.
- Embedded software in solid-state memory provides increased reliability.
- Ability to remotely update software and firmware using a failsafe process.
- Battery backup to ensure data integrity during main power outages.
- Configurations supporting unattended operation (possible installation on passenger trains and unattended vehicles).
- Extensive self diagnostics automatically monitor system operation and report problems.
- Components are factory calibrated and can be replaced in the field as convenient sealed modules.

# VISTA INSTRUMENTATION LLC

## Vista OpenGeo™ Track Geometry Measuring System

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### **Projected Accuracy and Specifications:**

1. The repeatability based on statistical data is derived from standard deviations calculated using average removed data over 200m segments of track in multiple runs of 8km at different speeds.
2. All the figures are quoted at a 95% confidence level.
3. Accuracies are based on previously tested sensors and are subject to revision.

Parameter	Repeatability (Raw Data)	Repeatability (Statistical Data)
Surface (vertical) profile (35m)	+/- 1mm	+/- 0.1mm
Surface (vertical) profile (70m)	+/- 1mm	+/- 0.1mm
Alignment (horizontal) profile (35m)	+/- 2mm	+/- 0.2mm
Alignment (horizontal) profile (70m)	+/- 2mm	+/- 0.2mm
Track Gauge (deviations from 1435mm datum)	+/- 0.5mm	+/- 0.1mm
Superelevation (cant)	+/- 1.5mm	+/- 0.15mm
Twist (over 3m length)	+/- 1.5mm	+/- 0.15mm

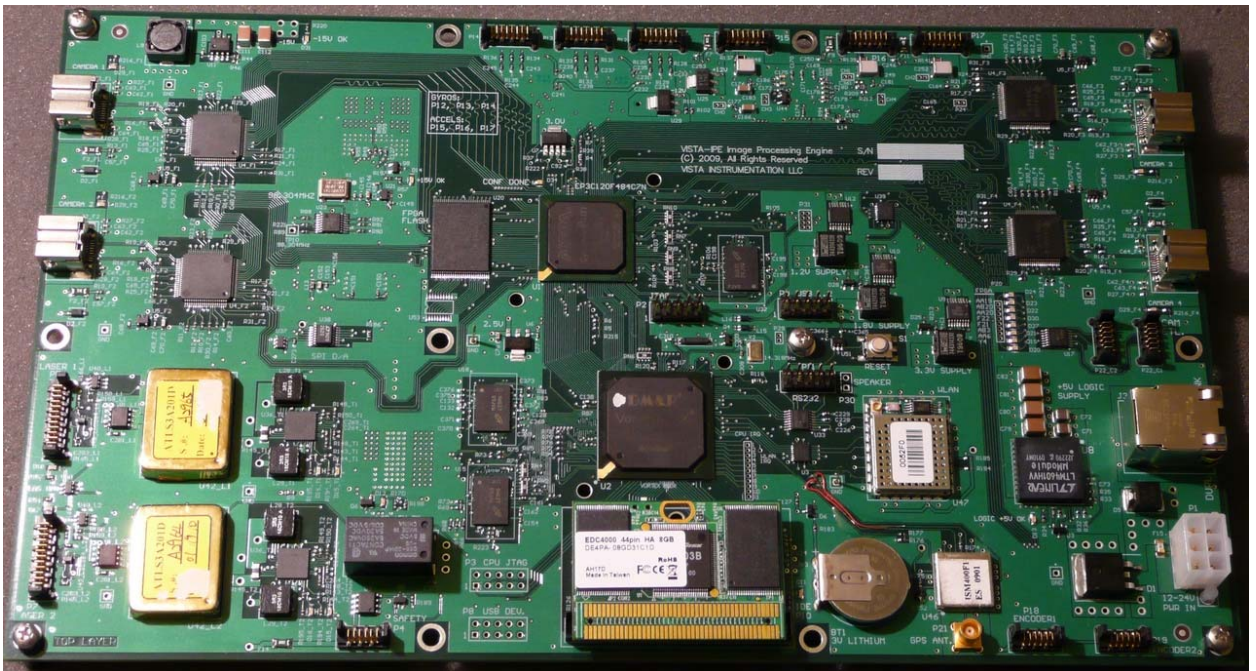
**Table 1 Projected accuracies**

# VISTA INSTRUMENTATION LLC

## Vista OpenGeo™ Track Geometry Measuring System

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The Vista-IPE image processing engine is a single circuit board made using state of the art components. This circuit board provides all needed functionality including digital image processing, interfacing with the inertial instruments (gyroscopes and accelerometers), laser illumination, tachometer interfaces, system control and diagnostics, wired and wireless networking, GPS and all power supplies.



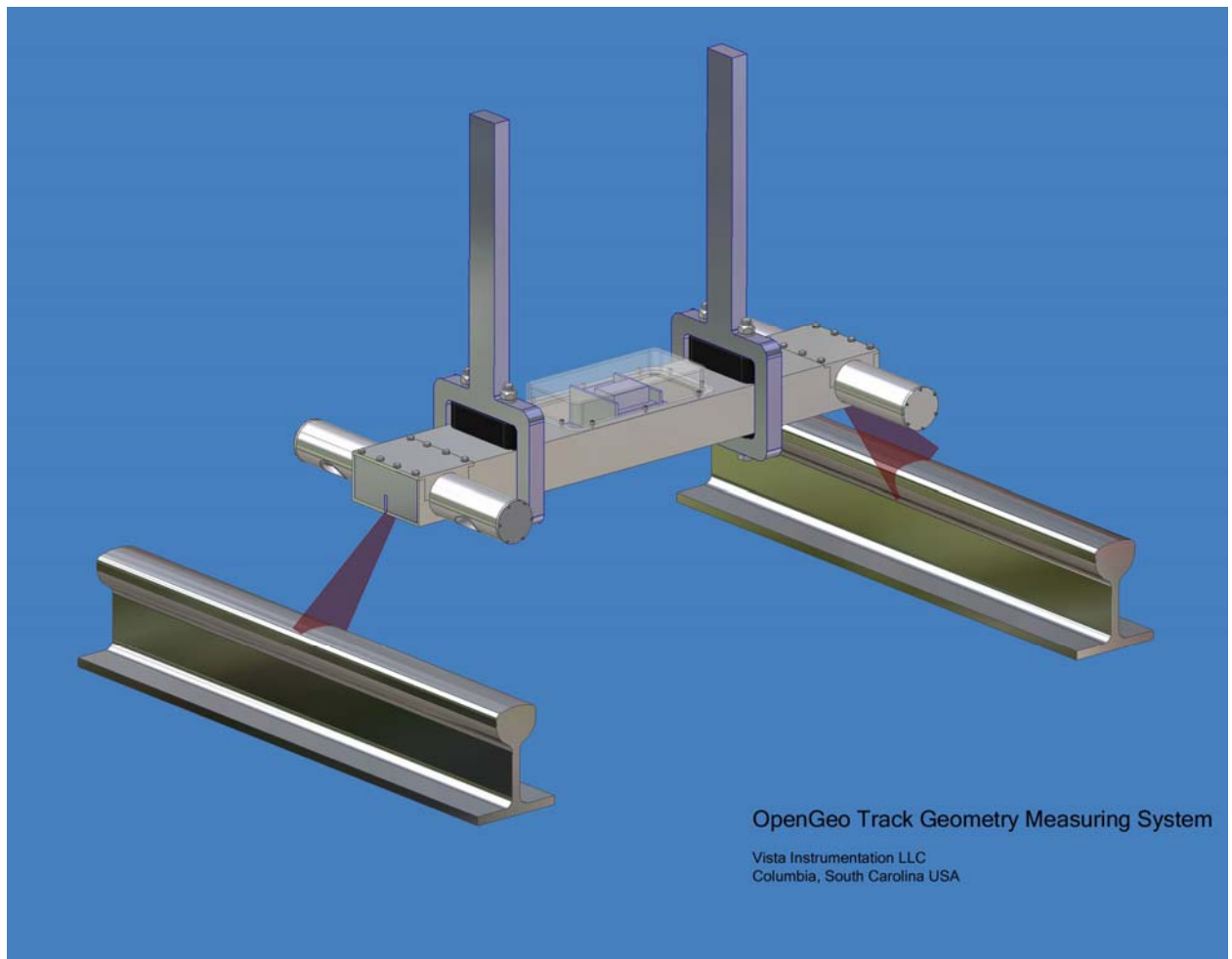
This component measures just 280mm x 160mm and is specially manufactured to provide extra rigidity for reliable operation in harsh environments.

# VISTA INSTRUMENTATION LLC

## Vista OpenGeo™ Track Geometry Measuring System

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The Vista OpenGeo™ system is compact and easily adapted to fit almost any situation. The mounting system has integral shock isolation and may be customized for any vehicle type:

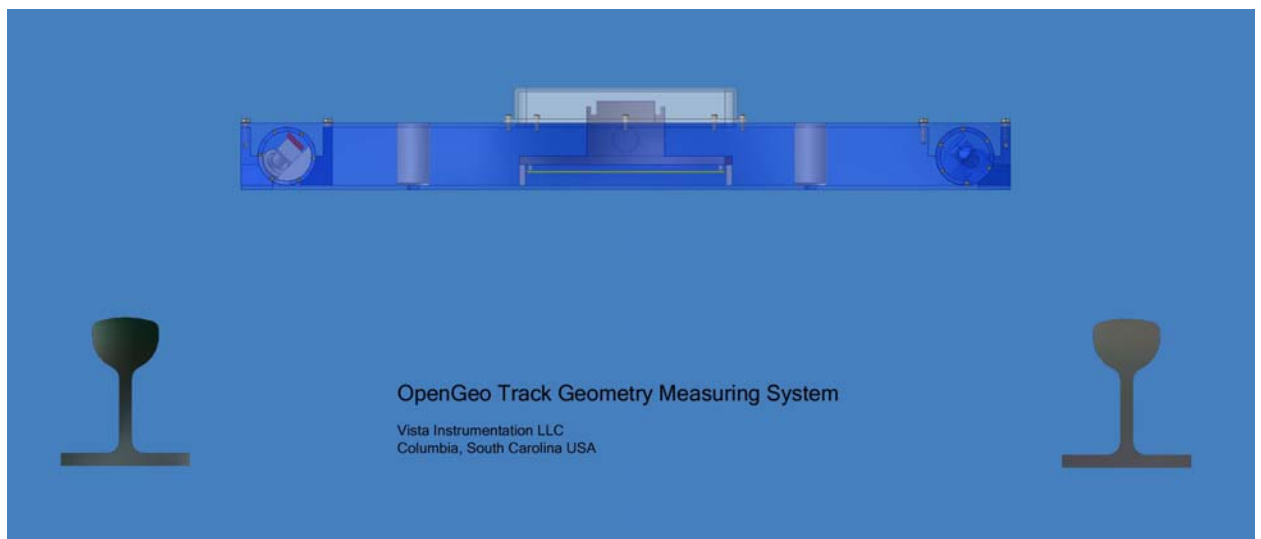
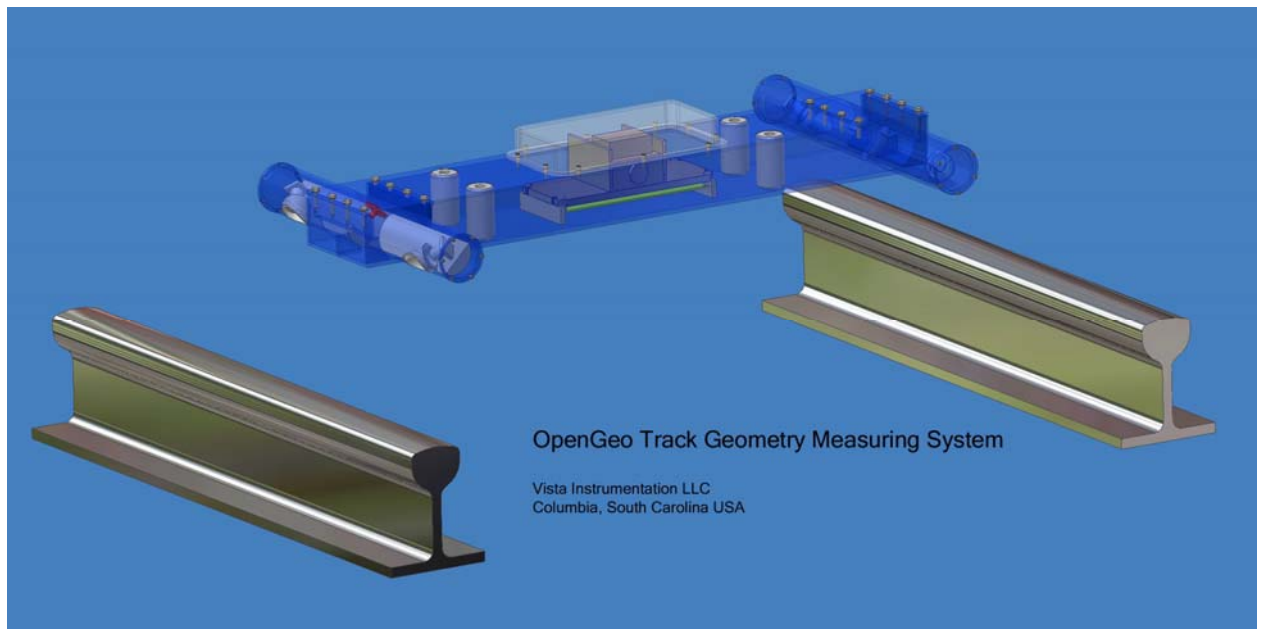


# VISTA INSTRUMENTATION LLC

## Vista OpenGeo™ Track Geometry Measuring System

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The exterior housing protects all internal components from the environment and a modular approach ensures easy serviceability:





# VISTA INSTRUMENTATION LLC

## Vista OpenGeo™ Track Geometry Measuring System

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Typical dimensions for the Vista OpenGeo™ Track Geometry Measuring System:

