KINAIRY®

A few years ago, NIST (National Institute of Standards and Technology) had a problem. Some laser tracker users had asked them for a field test which was quicker and simpler than doing a full ASME B89 certification in a calibration lab. Tracker users wanted something to use in the field, maybe before an important measurement job, to reassure them that their trackers were in fine form. The result was NIST's IR.8016 interim field check for laser trackers.

However, while NIST's brain trust developed the mathematics for the IR.8016, it still required a metrology artifact for the field test. So, NIST reached out to Brunson to develop such an artifact – and KinAiry was born. Here are some answers to a few questions that we commonly get:

DO I STILL NEED TO RUN MY LASER TRACKER'S BUILT-IN COMPENSATION ROUTINE?

Yes, tracker manufacturers recommend that the operator perform the built-in compensation routines before use. KinAiry is not a replacement for that, it is a tool to enhance your best practices and your quality program.

HOW IS THE KINAIRY / IR.8016 PROCESS DIFFERENT THAN RUNNING THE COMPENSATION ROUTINES?

Trackers are able to dynamically adjust for errors that are detected when built-in compensation routines are conducted. KinAiry does not make any adjustments to tracker operation, it only allows the operator to have a clearer view of potential problems. KinAiry is able to detect some error parameters which are not compensated by internal tracker functions.

WHY IS KINAIRY SUPERIOR TO SHOOTING A SCALE BAR AND RUNNING A 2-FACE TEST?

Two-face tests and shooting scale bars are helpful but are not fully comprehensive. There are many parameters within a laser tracker that can generate errors. The benefit of the NIST IR.8016 process is that it is a volumetric check of many of a tracker's potential geometric error sources. To accomplish this, many components are manipulated during the test - the positions of the tracker relative to the KinAiry reference bar, the amount of vertical and horizontal angular movement, and the orientation of the reference bar. By following this short but rigorous process, potential tracker error sources are exposed.

Performing only a simple 2-face test or shooting a scale bar is not nearly as comprehensive as the IR.8016. Data captured in this manner may well miss several sources of tracker error. You can end up thinking your tracker is good even though there is an issue.

For more information on potential errors not seen with simpler tests, please refer to the NIST IR 8016 whitepaper, (September 2014), Tables 1-4 / Sensitivity Matrix.

HOW DOES KINAIRY PROVIDE A BENEFIT TO THE NADCAP CERTIFICATION PROCESS?

One of our customers was recently going through the NADCAP certification process. The NADCAP auditor asked our customer to provide periodic test documentation showing that the tracker was performing within the manufacturer's MPEs (Maximum Permissible Errors). NADCAP requires that this process be done once a quarter for each laser tracker.

KinAiry's graphical error report, based entirely on the math defined in the IR.8016 standard, provides the user with documentation indicating how the tracker is performing against the MPEs. KinAiry helped our customer meet the periodic test requirement and gain their NADCAP certification.

IN TERMS OF REPORTING, HOW DOES KINAIRY'S GRAPHICAL ERROR REPORT DIFFER FROM WHAT WE TYPICALLY GET BACK FROM THE LASER TRACKER MANUFACTURER FOLLOWING A CERTIFICATION?

Different manufacturers handle their certification reports in different ways. One of the manufacturers does share some individual test results, showing errors relative to the allowable tolerances. Others may simply show how the test was done and provide a simple "pass" designation.

As mentioned, KinAiry's software generates an error report each time the test is run, comparing actual values to the manufacturer's MPEs for that tracker. So, a "best practice" might include running the IR.8016 before a critical measurement job, after a tracker is shipped or endures a bumpy ride, or simply on a regular periodic basis. Having a number of error reports over a period of time can provide you with both a baseline (if, for example, the tracker is tested immediately after returning from the manufacturer's certification) as well as trend analysis over several quarters of the year. The whole point of KinAiry and IR.8016 is to help you sleep better at night, knowing that your tracker is in fine form and giving you proper measurements.

SPECIFICATIONS

Artifact Length
8' 0.025" / 2.43 m

Artifact Rotation
360° with 45° stops

Solution Weight
Positioner: 24.6 lbs/11.2 kg
Length Artifact: 32.7 lbs/14.8 kg
Case (packed): 95 lbs/43.1 kg

Required but not Included
KinAiry software
Computer with Windows 7 or later
High quality retroreflector
Model 230 shop stand or
Model MAS2000TA portable stand

When the KinAiry bar is mounted to this Brunson stand...	The tracker must have an "eye height" of...
Shop Stand (230-0)	49-53 in. (124-134.5 cm)
Portable Stand (MAS2000TA)	49-60 in. (124-152.5 cm)

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