

NEW ORBITAL GONIOMETER THEODOLITE

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A newly developed Autocollimator Theodolite enables Galileo-inspired measurements of relative angles of optical system with high resolution and accuracy

INTRODUCTION

Increased sophistication of commercial earth observation, high resolution satellites require multiple sensors to be mounted in the satellite payload. The ever-growing demand of better spatial and spectral resolution are accompanied by Interalignment between various sensors. Moreover, the concept is applicable to general optical angle measurements for prismatic elements.

METHODS

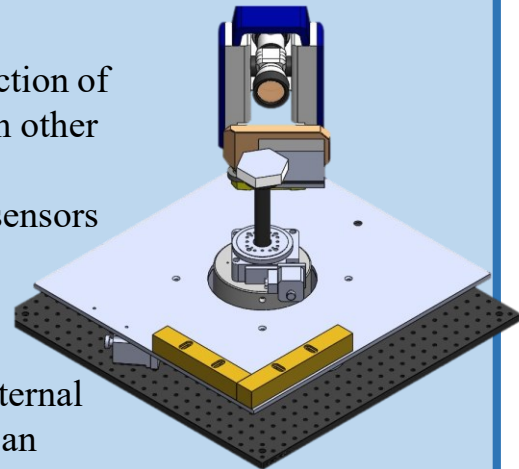
Based on a new technology of orbital transfer, a theodolite autocollimator conceived to transfer its measurement capability to orbital layouts was developed. Moreover, this technology is adequate for measuring angle in optical prismatic elements including polygons, pentaprisms, satellites (over 360 degrees) and others.

RESULTS

A prototype was assembled featuring:

- Accurate measurements of angular line of sight direction of various optical or electronic sensor in respect to each other and to the satellite frame.
- Mechanized measurements based on computerized sensors with minimum human involvement.
- Automatic loading/unloading of measured device, preferable by robotic arms.

The device is based on transferring the accuracy of an external rotating device to the to-be-measured device by building an orbital accuracy transfer system. In order to achieve the required rotational accuracy transfer, the measuring device is positioned on the perimeter of a rotating stage mounted around the to-be-measured part. For system control, a computer with a special algorithm is implemented.



CONCLUSION

- Proprietary & innovative technology offers angular measurements across all optical and micro-satellites needs.
- The system integrates the superior accuracies of a newly developed Autocollimation Theodolite with one of a kind orbital concept to offer excellent performance.
- This new technology is offered as a possible solution to automatic measurements of micro and mini satellites as they are increasingly used for commercial applications.

