GENERAL DESCRIPTION

Harmolign combines spatial directions with known geometry of LEDs embedded into boresight pads. With unique accuracy and speed, the 6 DOF of the pads and hence the LRU trays/mountings can be determined.

- Snap-on pads with no alignment requirements
- Orientation of each pad relative to the aircraft datum line
- Flexible configuration of pads
- Simultaneous measurement of datum pad and any other pad or pads
- No aircraft jacking or leveling needed
- No moving parts
- Full freedom to move and operate on aircraft while boresight is ongoing
- No scheduled maintenance required, no scheduled maintenance cost

ABOUT METRONOR

Metronor is an ISO 9001 certified high-technology company headquartered just outside Oslo, Norway. Based on in-house innovation and research, Metronor has since 1989 developed a range of electro-optical portable coordinate measuring systems in three business areas.

Military: Products and solutions for boresight systems, helmet tracker alignment, helmet tracking, and for lightweight position and orientation tracking for sensors and weapons.

Industrial: Portable measurement systems with applications for robotic production lines for the automotive industry, parts production and inspection for the aerospace industry, energy companies e.g. windmill blade production, turbine production, as well as large-scale casting companies.

Medical: Proven solutions within the micron-level accuracy range for pre-calibration of couches and gantries, in-line alignment solutions for patients, and closed-loop feedback solutions for real-time compensation of misalignments during treatment.

Metronor Norway (HQ)

Phone: +47 66 98 38 00
Fax: +47 66 98 38 01
email: info@metronor.com
www.metronor.com

METRONOR

Harmolign

Advanced Electro-Optical Boresighting System

METRONOR

METRONOR'S TECHNOLOGY

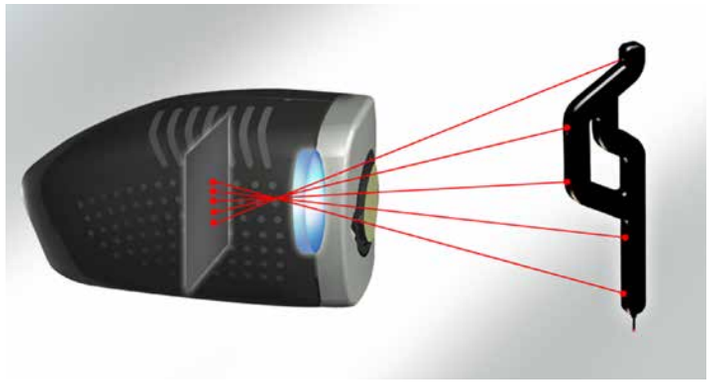
Metronor's technology is built upon in-house research and development within electro-optics and photogrammetry – the science of precisely determining the location of items based on images.

Enabling navigation and measurements of objects spatially by measuring an object's position and orientation with an extreme degree of accuracy in 6 degrees of freedom (6 DOF measurements).

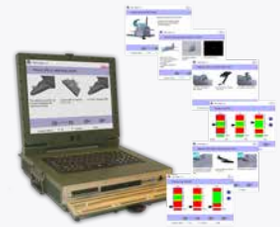
All Metronor products have three main components:

- A set of light sources, typically very robust and reliable Light Emitting Diodes (LEDs)
- One or more solid-state digital cameras, capturing images of the LEDs
- A computer, automatically controlling and optimizing the LED and cameras interaction

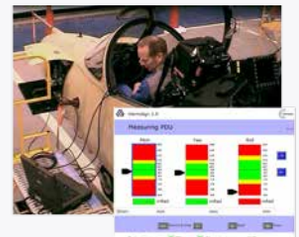
The LEDs are typically mounted into a structure such as a hand-held probe, a carbon-fiber pad, or a metal structure to form a stable pattern. If the shape and size of the LED pattern is known, then a single image of the LED pattern is enough to calculate where the LED pattern is relative to the camera – both in terms of position as well as orientation.



MAIN FUNCTIONALITY AND FEATURES

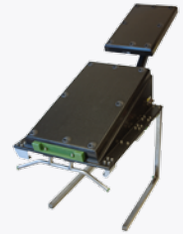


Graphic,
interactive displays



Shows accuracy
adjustments
in real-time

No need to
walk around
while measuring



Self-verification of
system performance;
No need to ship to
manufacturer for check

Rugged and robust,
qualified for temperature,
altitude, bench handling,
loose cargo, transit drop,
salt fog, rain, fungus, ATEX,
contamination, EMC

TECHNICAL SPECIFICATIONS

Type	Electro-optical boresight system
Principle	Volumetric, with camera continuously measuring all line replaceable units (LRUs) to weapon system platform datum
Accuracy	0,1 mRad (2σ)
Adapters	Carbon fiber with C matched LRU adapters
Temperature	-10˚C to +50˚C (15˚F to 120˚F) operating -30˚C to +70˚C (-22˚F to 160˚F) storage
Range	20 – 25 m (65 – 80 ft) max
Reliability>2400h MTBF	
Qualifications	Temperature, Altitude, Bench Handling, Loose Cargo, Transit Drop, Salt Fog, Rain, Fungus, ATEX, Contamination, EMC
Standards	MIL-STD-810 MIL-STD-461 MIL-STD-1472 MIL-STD-129 MIL-STD-1388 MIL-STD-1629 MIL-STD-498 MIL-HDBK-217 MIL-HDBK-454