High Parallel Test of Inertial Sensors

Applications:
- Inertial sensors such as gyroscopes, accelerometers, 6DOF combos, 9DOF combos
- Other MEMS applications on request

Solution for:
- All leaded and leadless packages, including tiny and fragile devices
- Typical carrier size 215 mm x 65 mm
- Strip sizes from 48 mm x 150 mm to 70 mm x 230 mm
- Tri-temp test from -40 °C to +125 °C

Inertial sensor test equipment

Standard strip handler + Physical stimuli module + Tilt axes / Rotational axis

Facts:
- High-parallel test in structures, i.e. strips, panels, or carriers
- Scalable modular architecture: convertible to various sensor applications and package types
- Support of a large variety of packages incl. tiny and fragile packages
- Robust handling with minimum number of device contacts and low jam rates
- Real-world (physical) sensor stimulus with high accuracy
InGyro TEST MODULE

1. Base System
1.1 InGyro Module
- 3-axis module for physical stimulation of inertial sensors up to 4DOF
- Compatible with Xcerra InStrip test handler for automatic strip or carrier handling, compliant to InCarrier process
- Available as ambient or AHC module

1.2 Temperature Test Options
- Ambient / tri-temp (-40 °C to +125 °C)
- Cooling standard: LN2 at 1.5 to 6 bar

1.3 Test Interface
- Tester interface: IEEE 488.2 (TCP/IP optional)
- Angle control from tester: via IEEE 488.2
- Index step control from tester: via IEEE 488.2

1.4 Human Machine Interface
- Panel PC with 25” touch screen, Windows 7
- Remote recipe management
- User configurable menus and run-screen
- Online help system

2. Conversion
2.1 Conversion Style
- InCarrier / strip style conversion

2.2 Conversion Time
- Package conversion time required: typically <30 min

2.3 Adjustment / Calibration after Conversion
- Semi-automatic adjustment at InStrip, e.g. width adjustment of conveyor system
- Semi-automatic angle calibration with precision reference inclinometer (0.01°)

3. Packages
3.1 Possible Package Style
- Singulated packages (with InCarrier process)
- Packages in strips (e.g. leadframes, BGA strips)
- Package types: leaded and leadless devices (e.g. BGA, LGA, QFN, MLF, WLCSP, SOIC, SOT, QFT)

3.2 InGyro Panel Specification
- Panel size: min. 48 mm x 150 mm; max. 70 mm x 230 mm
- Panel thickness: max. 6 mm

4. Contacting
4.1 Number of Contact Sites
- Number of signal lines: 1200
- Typical contacting force: 0.3 N/pin
- Indexing: ±55 mm in x-direction

4.2 Type of Contacting
- Typical: spring probe
- Lifetime contacting: typical >500k insertions
- Max. contactor resistance: 2.5 Ω + resistance of cable dock

5. Performance
5.1 Strip/carrier Alignment and Motion
- 2x tilt axis (α,β), 1x rotational (yaw) axis (Θ)

Tilt axes
- Tilt angle: α: -180° to +90°, β: -90° to +90°
- Position accuracy α,β: ± 0.1°
- Time to reach stable position (α° to 90°/90°): <1.2 s

Yaw axis
- Rotation angle Θ: ± 360°, 720° max. range
- Constant velocity (trapezoidal acceleration profile)
- Yaw rate: max. 700°/sec
- Time to reach stable yaw rate: 100°/s: <180 msec
- 200°/s: <260 msec
- 400°/s: <440 msec

5.2 Temperature
- Range: -40 °C to +125 °C
- Accuracy at contact site: ±2 °C
- Uniformity across strip/carrier: ±2 °C
- Temperature stability ± 1 °C
- DUT reference sensor reading accuracy (optional): e.g. PT100 class A, PT 100/PT 1000 class Y (±38)

5.3 Throughput
- Depending on tester capability (number of parallel contact sites, number of devices, layout of a panel, test time)
- Index time: 0.6 s
- Strip exchange time: 15 s

6. Facility Requirements
6.1 Supply Requirements
- Power: 398/446 Vac / 50 Hz / 3 phases /N/PE 208 Vac / 60Hz / 3 phases /PE 230/240 Vac / 50/60 Hz / 3 phase /N/PE
- Air: 5 ~ 10 bar (73 ~ 145 PSI), max. air flow 400/minute
- LN2: 1.5 ~ 6 bar (22 ~ 87 PSI), average consumption: 200 l/h

6.2 Weight
- InGyro module/total system (incl. base unit, loader, unloader) 180 kg / 1250 kg

6.3 Size
- InGyro system (incl. base unit, loader, unloader) 2.15 m (length) x 1.60 m (depth) x 2.10 m (height)

6.4 Mobility
- InStrip+InGyro+loader/unloader moveable on castor by 2 persons as one system

7. Compliance and Standards
7.1 Compliant to
- CE, E142