**Supplier Scouting Opportunity Synopsis 2023-022**

**Item to be scouted:** Dual-Probe Micro CMM

**Item description:** The NIST Dimensional Metrology Group (DMG) needs a replacement dual-probe (vision and micro-touch-probe) micro coordinate measuring machine (CMM) to replace our current outdated and unsupported dual-probe CMM (Mitutoyo UMAP Vision System Ultra QV350). Touch capabilities must permit measurement of internal and external features of size ranging from 25 um to several millimeters with as large as possible aspect ratios between the probe diameter and shaft length. Vision must be able to accurately measure pitch and feature size for grid plates and stage micrometers with line widths as small as 10 um. The minimum machine measurement volume needed is 250 mm (X) x 250 mm (Y) with a minimum of 150 mm in Z to allow for multiply item access during a sequence of measurements and allow space for item fixturing. Dual-probe technologies must be selectable without reconfiguration and not simply interchangeable probe types.

**Technical Information**

**----------**

**Supplier Information**

**----------**

**Type of supplier being sought:** Manufacturer

**Reason for scouting submission:** Market research for other suppliers and other suitable products

**Summary of technical specifications and performance requirements**

**----------**

**Describe the manufacturing processes (elaborate to provide as much detail as possible):** The instrument design must incorporate precision metrology components including rigid structure, low expansion high-accuracy/high-resolution scales, and minimal error motion stages.

**Provide dimensions / size / tolerances / performance specifications for the item:**

- Table accommodation space 400mm x 400 mm
- Resolution of machine scales ≤ 0.01 µm 4. Must have dual-probe capability, contact and vision, without instrument reconfiguration and not simply interchangeable probes.
- Vision must be capable of standalone operation
- Contact probe must work in conjunction with vision for coordinate system establishment.
- Must be able to use vision system to establish coordinate system for touch probe.
- Must be able to calibrate the offset between the touch probe (ball tip
- center) and center of the vision probe (focal point).
- Autonomous measurement capability required after coordinate system is established.
- Touch probe
    - Measurement directions: X, Y, and Z
    - Probes must be replaceable.
    - Probe diameters must be available to measure inside diameters down to 25 µm
    - Multiple probes with different probe tip diameters and shaft length must be available to optimize aspect ratio between tip diameter and shaft length, maintaining maximum permissible depth of measurement for inside diameter/width measurement while maintaining accuracy*.

- Measurement speed ≥ 5 µm/s
- 1D length repeatability ≤ 100 nm (with any probe).
- Vision
    - Lighting options: must include back lighting, ring lighting, and coaxial lighting.
    - Table capacity ≥ 28 kg
    - Automated objective changeout desirable
    - Objective choices capable of measuring line widths from 10 µm to 250 µm with pixel size < 1 µm.
- Measuring accuracy:
    - E1X, Y ≤ (0.25 + L/1000)µm, L = mm
    - E2XY ≤ (0.5 + 2L/1000)µm, L = mm
    - E U, MPE ≤ (1.3 + 3L/1000)µm, L = mm
    - P F2D, MPE ≤ 1.0 µm
- Options:
    - Available touch probes and objective choices must be specified with their associated costs.
    - Integratable fixturing and manipulating accessories should be included, but priced separately as options.

**List required materials needed to make the product, including materials of product components:**
Product should be sold as a standalone unit.

**Are there applicable certification requirements?**: No
**Are there applicable regulations?:** No
**Are there any other standards, requirements, etc.?:** Supplier must demonstrate proof that performance meets agreed upon specifications stated and tested according to the following standards:
- ISO 10360-7:2011 for Vision
- ISO 10360-2:2009 and 10360-5:2010 for Touch Probe

Performance testing must be done after installation and stabilization, in controlled NIST lab environment.

**Additional Comments:**
Instrument will be maintained in a precision temperature (+/- 0.01 C) and humidity controlled lab. Instrument air supply is available, in lab, up to 100 psi (690 KPa).

**Business Information**
**----------**
**Volume and pricing**
**----------**
**Estimated potential business volume:** The intention is to buy one. What this purchase means for the potential future sales to others is unknown.

**Estimated target price / unit cost information (if unavailable explain):** $500K

**Delivery requirements**
**----------**
**When is it needed by?:** 6 months

**Describe packaging requirements:** Assembled and delivered or delivered and assembled on site is acceptable.

**Where will this item be shipped?:**

NIST
100 Bureau Drive
Building 219, Room F036
Gaithersburg, MD 20899

**Additional comments**
**----------**
**Is there other information you would like to include?:**
The current make and model benchmark is the Mitutoyo ULTRA UMAP Vision System 404 TYPE2. Looking to meet or exceed.

Additional Information
---
Agree (click to read agreement): Yes