

# HORIBA



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Director of Innovation

Camera-readable Patterned Position Scales:  
Improving your In-plane Positioning Performance  
in the Context of Machine Vision & Automation

25 June 2024. 16:00 - 17:00 CEST

EPIC Members  
New Product Release



# HORIBA France

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- **HORIBA France & Jobin-Yvon technology known for**
  - Diffraction gratings
  - Spectrometers
  - Spectroscopy instruments

... today we will introduce a new product in a different field:

- **Position & motion-sensing solution *nanoGPS-OxyO***

Can be of interest to you if:

- You use/integrate positioning or motion systems
- You care about position accuracy, or reproducibility, or drifts, ...

AND you have a camera in your system

# A product for position measurements, using any existing camera

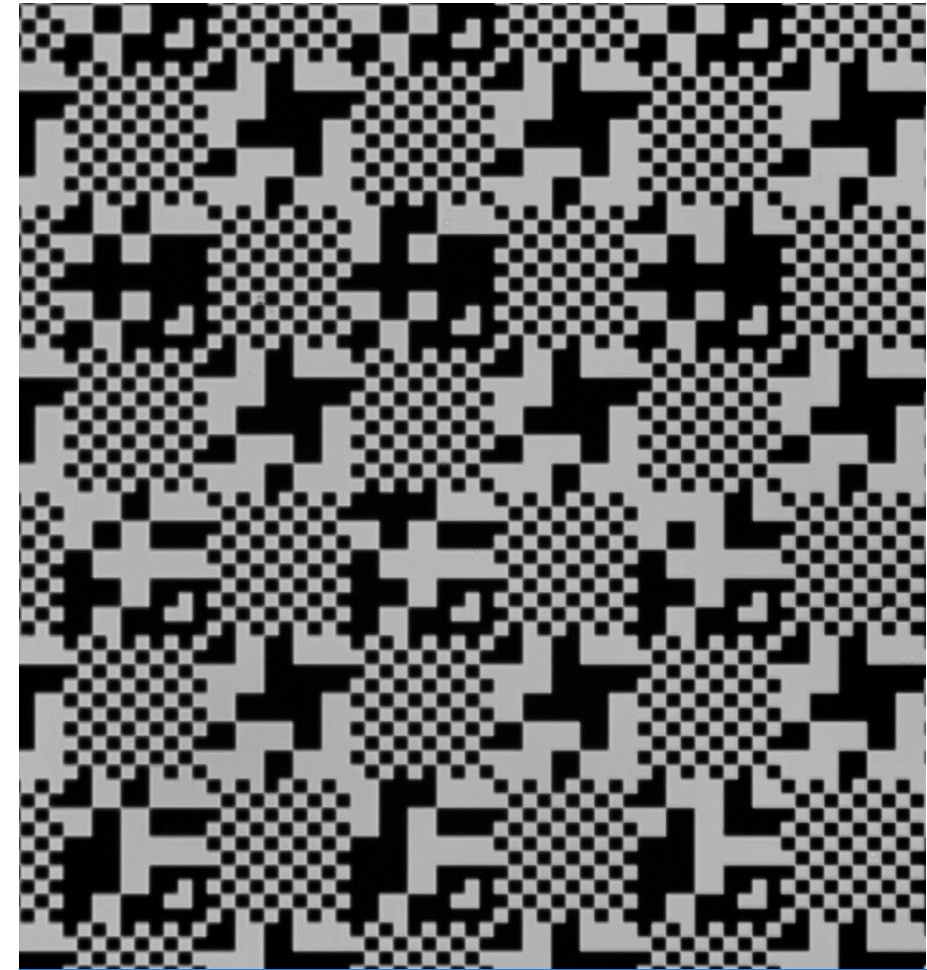
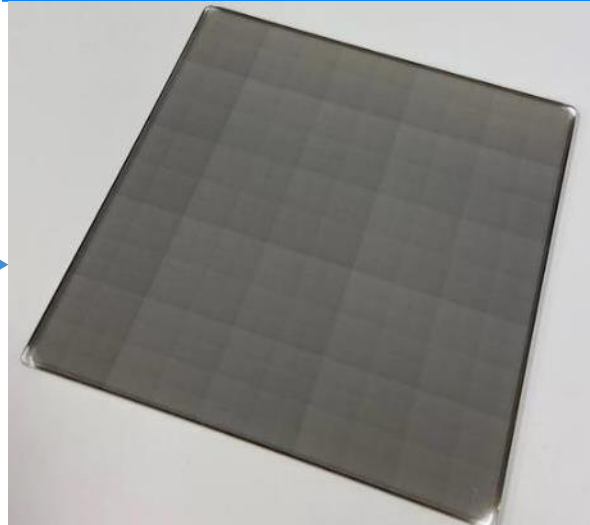
Any Camera



nanoGPS OxyO®  
commercial kit

OxyO software

nanoGPS OxyO® scale



$(X, Y) = (0.000, 0.000) \mu\text{m}$   
 $\text{Phi}_z = -3.1404 \text{ rad}$



Any positioning

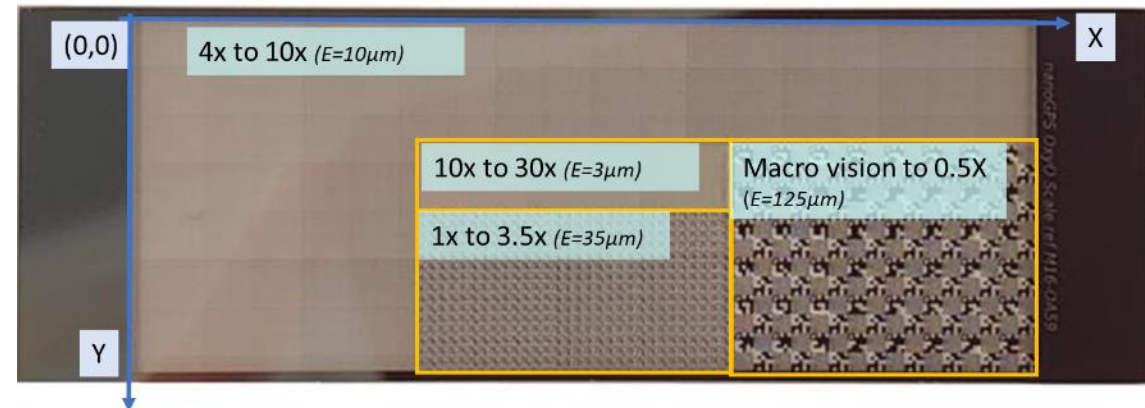
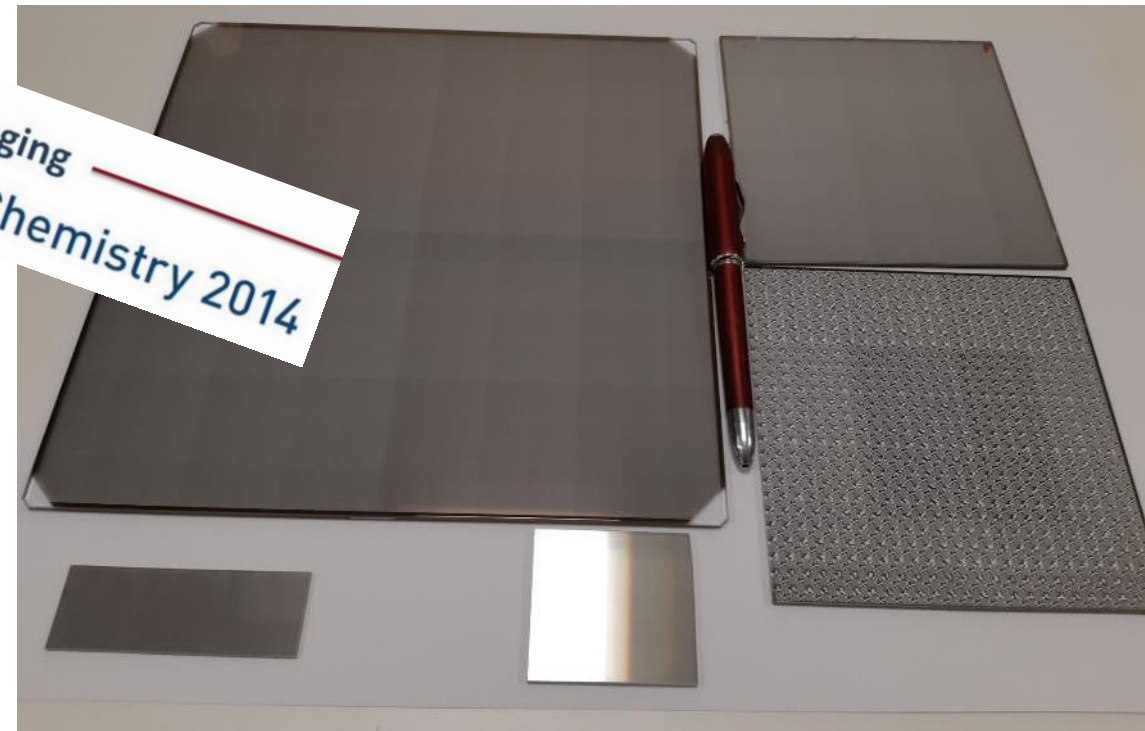
system

served.

# Precision and accuracy of nanoGPS technology

- **Precision**
  - Down to 1nm in X, Y; 7 $\mu$ rad in  $\varphi_z$
- **Speed**
  - Up to 300Hz with USB3 camera
- **Different models of scales**
  - Size : from mm<sup>2</sup> to 1m<sup>2</sup>
    - to accomodate Travel
  - Accuracy
    - Quartz scale accuracy: 150nm over 80mm
  - Working distance
- **HORIBA is the only commercial provider of machine-readable scales**

Super-resolution imaging  
The Nobel Prize in Chemistry 2014



# Internal adoption of our camera-readable scales triggered our go-to market

- **Product Dept**

- New features to our raman microscopes

Objective Adjustment (OA)  
Video Raman Matching (VRM)

The guarantee of perfect beam positioning whatever the objective

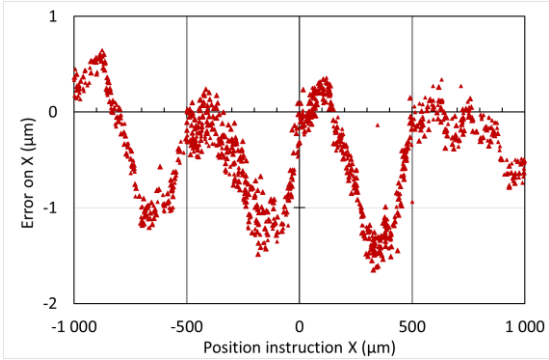
- New solutions

nanoGPS navYX™  
Collaborative Correlative Microscopy Solution

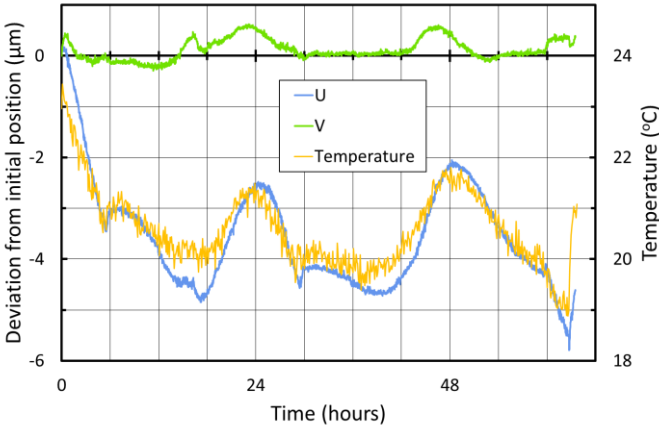
Perform Multimodal Observation  
Combining SEM, Raman and  
Optical Microscopes

- **R&D Dept**

- Moving stages issues



- Stability issues



- Software debug

- **Prod & Indus Dept**

- Automated alignment camera & stage;
- Automated magnification determination
- Automated QC and tests

- **Service Dept**

- Checking issues at customer's site

# Products available at <https://store.eu.horiba.com/pages/position-sensing>

- **Commercially-availables Camera-readable scale + software**

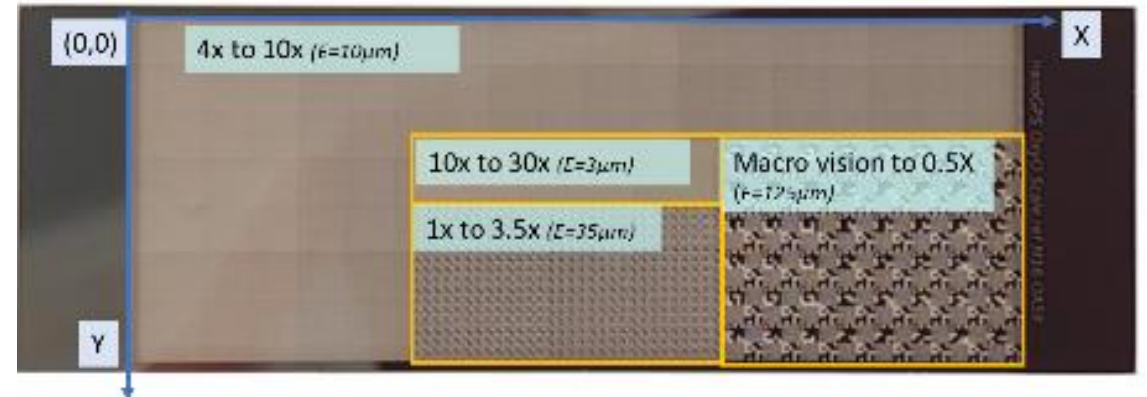
- HORIBA Store (keyword nanoGPS-OxyO)
  - Technical details, examples, RFQ
- « discovery kit » : invent your applications !
  - Start Hands-on nanometrology with less than 1k€  
<https://store.eu.horiba.com/products/nanogps-oxyo-discovery-kit>

- **For an oem perspective:**

- Contact Olivier Acher [olivier.acher@horiba.com](mailto:olivier.acher@horiba.com)



- Larger and/or more accurate scales available



<https://www.researchgate.net/profile/Olivier-Acher>

# Who is using this type of products ?

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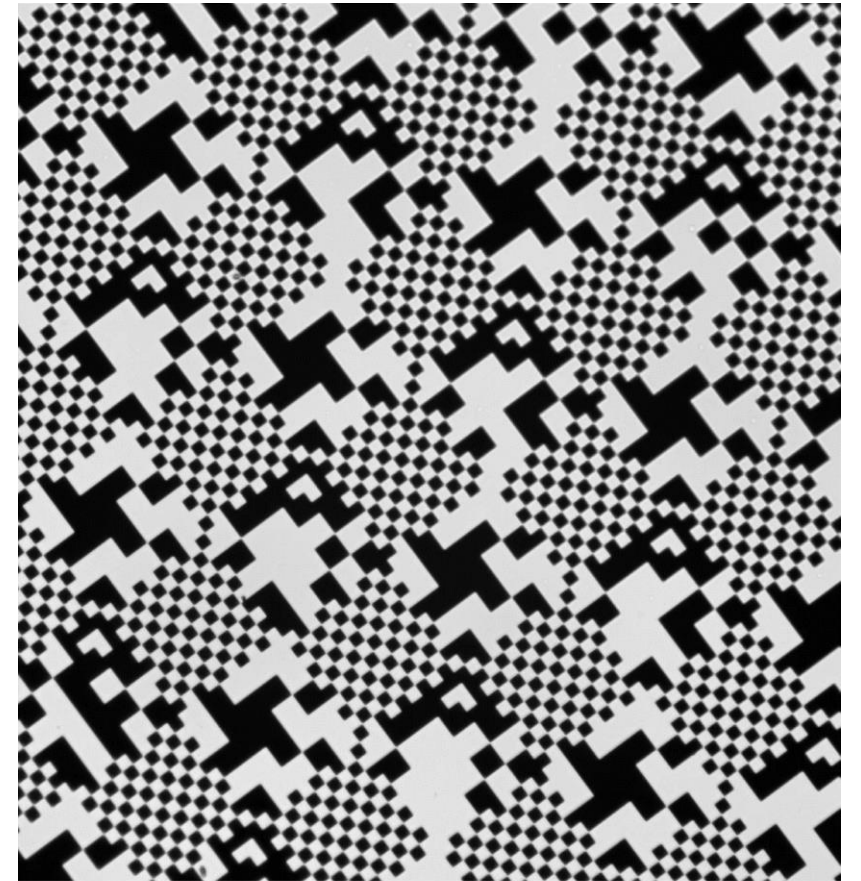
- **Stage manufacturers, integrators & users**
- **Microscopy manufacturers, integrators & users**
- **Instrumentation companies**
- **Laboratories**
  
- **Robotic solution provider**
- **Industrie 4.0**

# Take-home message

- You can use any camera for position measurement
- The positioning performance is a system issue; which referential is adequate for your ?
- HORIBA provides machine readable scales + software
  - Retail: nanoGPS-OxyO kits
  - Oem: kits; customized solutions based on nanoGPS technology
- An easy start to hands-on nanometrology is :



I will be pleased to answer your questions online ! Or get in touch [olivier.acher@horiba.com](mailto:olivier.acher@horiba.com)



$(X, Y) = (0.000, 0.000) \mu\text{m}$   
 $\text{Phi}_z = 0.934 \text{ rad}$



Omoshiro-okashiku  
Joy and Fun



Terima kasih  
谢谢  
Gracias  
Σας ευχαριστώ πάρα πολύ  
धन्यवाद  
شُكْرًا  
Danke  
Tack ska du ha  
Grazie  
**THANK YOU**  
Obrigado  
Большое спасибо  
Cảm ơn  
Merci  
감사합니다  
ขอบคุณครับ  
ありがとうございました  
Dziękuję

# Some nanoGPS-OxyO oem customers develop their position encoder

