MODS
The OROS Mobile DAQ System

OROS Webinar

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Product manager, OROS France

Nick Hoffman
Application Engineer, OROS Americas
About your presenters

Nick Hoffman

Joined OROS Americas May 2020. Responsible for supporting US users and sales team. Recent graduate, worked NVH support from 2015 and consultation from 2017.

Nicolas Givelet

Nicolas Givelet manages strategic accounts and innovative partnerships at OROS. He was the MODS products manager. His experience in matching application with signal processing and systems architecture have enabled him to develop and manage the continuous improvement of the instruments and software platform of the OROS real-time noise and vibration measurement and analysis systems during 20 years.
About the webinar

⇒ Please write your questions in the Q&A area
⇒ We will take time to answer at the end of this webinar

⇒ Your webinar is recorded
⇒ You will be able to replay it anytime
Contents

> OROS Introduction
> The Teamwork offer
> MODS positioning and usages
> OR10 DAQ
> NVGate Operations
> NVGo App monitoring App
> Live demo
> Q&A
Made for Your Demanding World

**Industrial Sectors**
- Automotive
- Aerospace
- Energy and Process
- Marine
- Precision Machining and Process

**Applications**
- Noise
- Rotating
- NVH
- Structural Dynamics
- Quality Process and Control

**Product Life Cycle**
- R&D
- Acceptance
- Diagnostics
OROS – Noise and Vibration Testing and Analysis Solutions

Full Software suite
- Comprehensive
- Application oriented
- Rotating
- Structural Dynamics
- Data Acquisition and Signal Processing
- Acoustics

Services
- Customer Support
- Consulting & Coaching
- Customization & Integration

State-of-the-art Instruments
- From 2 to 32 channels
- Distributed up to 1000+
- DataCare®
- Made for any testing environment

Flexible
Teamwork, the OROS Noise & Vibration Testing Systems

On-site services

End of line test

Distributed acquisition

Team's Office

Instrument store

Common data storage

Office licenses

Data sharing

Large ch. counts

On board

Test bench
Trends of Portable N&V Measurements

- **Streamlining repetitive measurements**
  - Simple and predefined operations
  - Workflow: Experts ⇔ Operators ⇔ Analysts

- **Access to harsh environments**
  - Avoid PC’s constraints
  - Fully autonomous
  - Easy to handle

- **Secure measurements**
  - Cyber security compatible (No PC)
  - Informed and shareable data

Mobile, Integrated, Simple
Trends of N&V Small Channel Count

- Traveling light
  - Less cables, light
  - Easy to carry on site

- Complete software suite
  - Modern interface
  - Mastered metrology

- Secured
  - Real-time operations

Mobile, Accurate, Complete
Teamwork MODS Applications

- On-site services
- End of line test
- Distributed acquisition
- Test bench
- On board
- Large ch. counts

- Instrument store
- Common data storage
- Office licenses
- Data sharing
- Team’s Office
Typical usage 1/2

- In vehicle / on board tests
  - Vehicle dynamics, flight domain test, interior NVH
  - Test centers, OEM parts integration

Test preparation

- Setup template
  - Expert

Measurements

- Operators
  - Data acquisition
  - Check/Inform measurements

Post-process

- Analyst / expert
  - Post-processing
    - Result analysis
  - Test report
    - Graphs
    - Test information

Office | Track | Office
Typical usage 2/2

- **On-site services**
  - Predictive Maintenance
  - Machinery diagnostics

**Preparation**
- Measurement setups
- Easy travel

**Measurement**
- Monitoring with Tablet
- Machine
- On-line analysis with PC

**Analysis & Report**
- Software suite
- Customer

**Trip**
- Machine site
- Office
OROS Mobile DAQ System

More than just a hardware -> An ecosystem

Multiple possibilities:
- Operating modes
- Modular components
- Measurement situations
- Users profiles

Ideal for Teams & Fleets
Mobile
  One hand holding
  Wi-Fi, 6 h of operations
  Removeable µSD card

Accurate
  8 inputs 102.4 KS/s, 2 ext. sync, ±40 V,
  Teamwork metrology
  GPS, CAN Bus

Simple
  Large buttons keyboard
  Touch screen
  headphone plug to listen inputs
Package contents

What is delivered with the DAQ

- LEMO to 3 BNCs cables
- Ethernet cable
- Power supply
- USB-C cable
- Antennas (GPS, Wi-Fi)
- Carrying bag with removeable pouches for sedentary and nomad accessories
## OR10 Specifications

<table>
<thead>
<tr>
<th>Operating modes</th>
<th>Stand alone / Android tablet or smartphone / NVGate Front-end</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data recovery</td>
<td>Direct import from NVGate</td>
</tr>
<tr>
<td>Interface</td>
<td>Wi-Fi 802.11 n/a/c LAN (100Mbps)</td>
</tr>
<tr>
<td>Input connector</td>
<td>3 inputs per LEMO</td>
</tr>
<tr>
<td>Input channels</td>
<td>4 or 8 dynamic + 2 ext sync.</td>
</tr>
<tr>
<td>Coupling</td>
<td>AC/DC/ICP/TEDS/FLOAT</td>
</tr>
<tr>
<td>Input range</td>
<td>±300 mV ~ ±40 V all couplings</td>
</tr>
<tr>
<td>A/D converter</td>
<td>24 bits</td>
</tr>
<tr>
<td>Dynamic range</td>
<td>140 dB</td>
</tr>
<tr>
<td>Phase match</td>
<td>±0.02° @ 20 kHz</td>
</tr>
<tr>
<td>Amplitude match</td>
<td>±0.01 dB@ 20 kHz</td>
</tr>
<tr>
<td>CAN</td>
<td>16 ch. 2.0A &amp; B, 125 kBs to 500 MB/s, 10 Hz</td>
</tr>
<tr>
<td>GNSS</td>
<td>10 Hz GPS, Galileo, Beidou, galileo</td>
</tr>
<tr>
<td>Headphone</td>
<td>3.5&quot; stereo jack, live input playback</td>
</tr>
<tr>
<td>Tachs/triggers</td>
<td>2 ext. sync 6.4 MHz on ch. 8 and 9</td>
</tr>
<tr>
<td>Volume of memory</td>
<td>removable 16 GB ExFAT μSD</td>
</tr>
<tr>
<td>Size</td>
<td>Approx. 170 x 115 x 34 mm, 380 g</td>
</tr>
<tr>
<td>Battery autonomy</td>
<td>Continuous recording @ 25.6 kS/s &gt; 4 h</td>
</tr>
</tbody>
</table>

### State-of-the-art:
- Autonomy,
- Flexibility,
- Performances,
- Accuracy,
- Robustness,
- Openness,
Multi-modes

Front-end

Post-Processing

Mobile

Standalone
Connected

Real-time & analysis, acquisition setup preparation and measurement recovery with software platform on PC.

Connection
- Ethernet 100 Mb/s
- Or Wi-Fi (802.1 a/c)

(Post) Analysis
- All NVGate options & features
- All software suite modules
- Computation & record on PC
Standalone…

…with OR10 in the hands

Ultra simple keyboard
  Navigation
  REC/Stop

Touch screen
  Inputs status
  Record duration
  Measurement name

Setup
  Templates list from NVGate
  Checks ICP, Auto-range
NVGo: Be mobile…

…around the acquisition

**Android App**
- Smartphones
- Tablets
- Disconnection proof Wi-Fi

**Configuration**
- Front-end & Recorder
- NVGate Models’ based

**Display**
- Monitoring vu-meters
- Signal
- Spectra
NVGo

An acquisition monitor that…

Show the essential,
- Inputs status / name
- Recording status and time
- Available memory and duration

Secure your measurements,
- Front-end table (reduced)
- Model based templates with properties
- Sampling & record status always on top
Hands on!
Thank you

Watch our MODS video from [https://www.youtube.com/user/OROSanalyzer](https://www.youtube.com/user/OROSanalyzer)

Especially the *Lawn Mower Vibration Testing with OR10*
OROS software modules for MODS

- **Noise & Vibration Software Platform**
  - Spectral Narrow Band Analysis
  - Time Domain Analysis
  - Automatic Reports
  - Sequenced acquisitions
  - Waterfall & Profiles
  - ASAM ODS

- **Acoustics Analysis**
  - 1/n Octave Analysis
  - Multi-channels Sound level meter
  - Sound Power
  - Sound Intensity
  - Sound Quality
  - Beamforming
  - Holography
  - Transfer Path Analysis
  - EV/HEV NVH

- **Rotating Analysis**
  - Spectral & Order Diagnostics Toolset
  - Order Tracking analysis
  - Balancing
  - Rotor Dynamics
  - Reciprocating Machines Diagnostics
  - Torsion & Twist
  - Monitoring

- **Structural Dynamics Analysis**
  - Operating Deflection Shape
  - Modal Analysis
  - FRFs acquisitions
Questions & Answers
Upcoming Webinars

> October - NVGate V12 Tips and Tricks
> November - Sound source identification
> January / February 2021 - Characterizing the dynamic behavior of the machines using modal analysis

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