

Numurus' smart sensors combine sensing, analytics, control, communications, and machine learning capabilities together in compact cloud-enabled packages to facilitate rapid development of advanced robotic inspection and navigation solutions.

Multiple Sensors In One

The 3DX system combines multiple modes of underwater 2D and 3D imaging coupled with an embedded IMU to create a formattable platform for both in-water and out-of-water robotic automation development.

Embedded Super Computer

The 3DX is outfitted with NVIDIA's Jetson TX2 embedded AI-engine to turn raw data into real-time automation and inspection information within the sensor, rather than relying on an external processing system.

Modular Software Platform

In order to accelerate the creation of embedded processing pipelines and mission critical information, Numurus offers out-of-the-box and customized ROS- based software modules to create powerful processing pipelines and accelerate mission critical information.

3DX Sensor Options

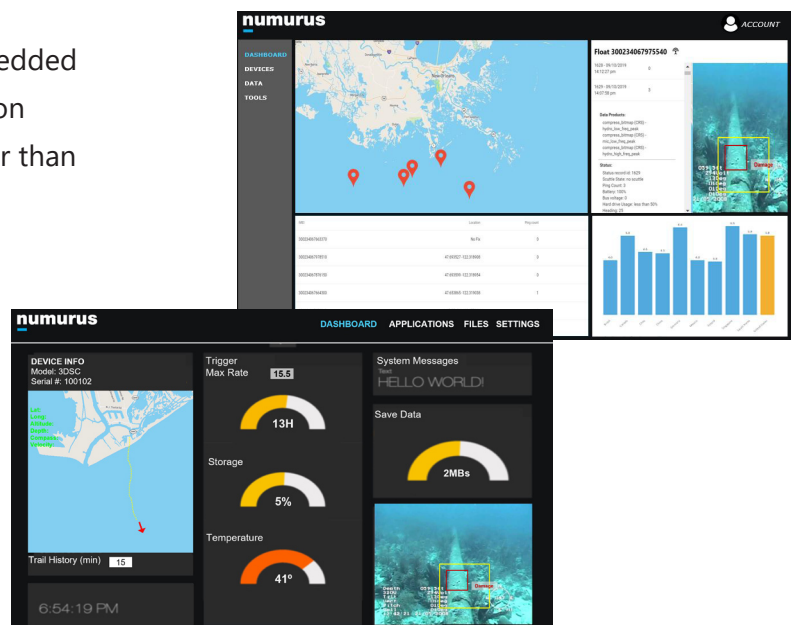
- Stereoscopic 3D HD Camera
- Electrically Scanned 3D Sonar
- IR Pulsed Laser 3D Time-of-Flight Camera

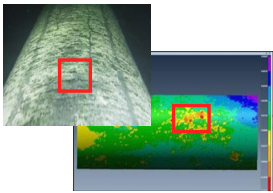
3DX Features

- 2k Lumens Programmable LED Bank
- LORD 3DM-CV5-25 IMU for Onboard INS
- Jetson TX2 GPU for Onboard AI
- Programmable Hardware Triggers
- ROS Compatible Software Modules (Processing, Control, and Communications)
- Onboard Storage

Interface Options

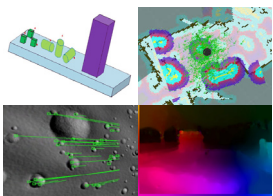
- Machine to Machine through ROS
- Resident UI through Web Browser
- Online through NEPI Cloud Services





Automated Inspection

Create unique on-board detection and classification processing pipelines and feed in data from a combination of sensing technologies to achieve reliable and robust results.



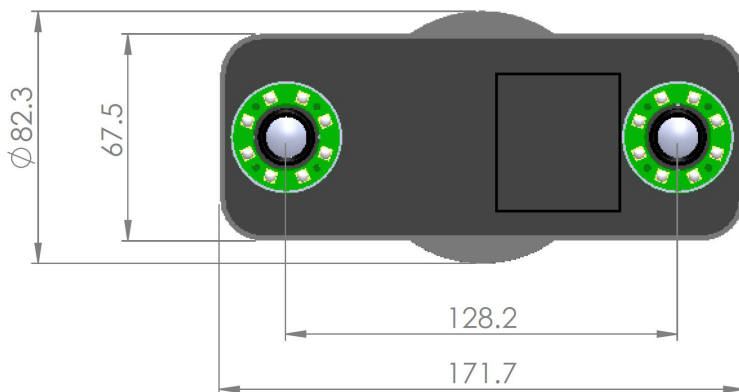
Feature-Based Localization

Combine on-board inertial navigation algorithms with a variety of non-traditional image based localization techniques such as optical flow, FBO, and SLAM to achieve high positional accuracy in GPS-denied environments.

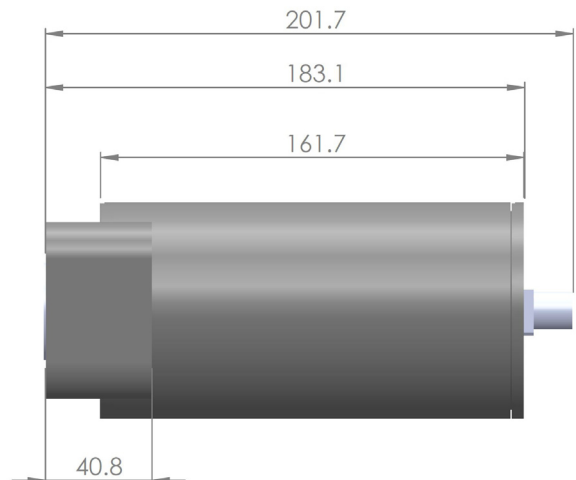


Manipulator Automation

Apply trained object detection and orientation classifiers to create continuous streams of manipulator-to-object pose estimates.



Units: mm



Integrated Sensor Options

2D/3D Stereoscopic HD Camera	1952 (H) x 1243 (V), Color
2D/3D Electrically Scanned Sonar	2.5 MHz, 60°x60° Scan field, 2°x2° Beams, 1mm range resolution
2D/3D Time-of-Flight Laser Camera	320 x 240 QVGA, 70x60 FOV, 60fps, 850 nm

Additional Features

Dimmable LED Bank	2000 Lumens
IMU	LORD 3DM-CV5-25

GPU Processor

NVIDIA Jetson TX2

Onboard Storage

256 GB SD Card

Digital Interfaces

Interface I/O	Ethernet 10/100/1000
Hardware Triggers	TTL Level Input and Output

Electrical

Supply Voltage Range	9-48 VDC
Power Estimates Standby/Avg/Max	0.1 W / 15 W / 35W

Mechanical

Dimensions	18.3cm x 17.2cm x 8.2 cm
Weight in Air/Water	5 lb / 1.6 lb

Thermal

Operating Temp Range	-20°C to +65°C
Thermal Throttling Range	+65°C to +85°C