3DX-PL100
A Smart Perception Sensor Platform

Hardware Features
• 3x Connector for 2D/3D Sensors
• 1x Connector for DVL or GPS
• 1x External Interface Connector
All Connections include Comms, Power, GPS/PPS, & Trigger I/O
• NVIDIA TX2
• IMU
• Solid Stage Storage
• Power Supply Relay Board

Data Streams
• Nav & Pose
• 2D Color Images (Right/Left)
• 3D Depth Image & Point Cloud
• AI Classification Output Streams

Interface Options
• ROS Data and Control Topics
• Resident UI through Web Browser
• NEPI Smart IoT to Cloud or Remote Server

Advanced Sensing Technologies
3DX smart perception payloads interface external 2D/3D imaging/mapping technologies with an internal IMU, GPU, and Edge software management suite within a compact underwater housing to facilitate the rapid development of advanced robotic inspection, manipulation, and navigation solutions.

Integrated Local and Remote Software
3DX payloads run an on-board Resident User Interface (RUI) that offers a web browser based portal for local system interface. In addition, 3DX sensors include Numurus’ NEPI smart IoT software interface for remote system and data monitoring/management.

ROS Based Data and Control Interface
Quickly integrate 3DX data and control into existing user interfaces or autonomous control systems leveraging intuitive well documented ROS topics.

On-Board AI Support
All 3DX payloads are 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 solutions.
Applications

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 across a variety of conditions and targets.

Improved 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 position accuracy in GPS-denied environments.

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

Specifications

**Hardware**
- **GPU**: NVIDIA TX2
- **IMU**: Translation 1.0 % Rotation 0.013°/m
- **Internal Storage**: 256 GB SD Card

**Communications**
- **Ethernet Comms**: 4 x Ethernet 100 Base-T
- **Serial Comms**: 1 x Ethernet 100 Base-T
- **GPS/PPS**: (All) RS232 Rx and TTL Line
- **Interface I/O**: (All) TTL Input/Output Lines

**Electrical**
- **Input Voltage Range**: 10-36 VDC
- **Output Voltage Range**: 24 VDC
- **Power Estimates**: 5 W / 15 W / 30 W (Does not include sensor loads)

**Mechanical**
- **Connector Options**: Impulse MKS 310 (100 Mbits/s)
- **Housing Dimensions**: 18 cm x 10 cm OD
- **Weight in Air/Water**: 2.0 lb / 0.5 lb
- **Depth Rating**: 1 km

**Thermal**
- **Operating Range**: -20°C to +65°C