**Introducing IQR Multi-modal Sensor Module: A Cutting-Edge, Plug-and-Play Solution for Environmental Perception in Robotics**

In the rapidly evolving world of robotics, IQR's multi-modal sensor module offers an easy-to-integrate, high-precision, full-fusion environmental perception solution tailored for mobile robot developers. Engineered with simplicity and high performance in mind, this solution adapts seamlessly to mainstream mobile robot, empowering research teams, professors, and students globally to kickstart their research and applications without the complexity of setups.

Whether you're a robotics researcher or a non-robotics user, IQR provides a hassle-free experience with robust software support and AI integration, allowing you to focus on your core **research rather than the intricacies of system configuration.**

**Key Features:**

Plug-and-Play for Effortless Setup: The module features standardized interfaces (USB3.0, GMSL2, Ethernet, HDMI)

compatible with leading mobile robot platforms, ensuring quick hardware adaptation without complex debugging.

**User-Friendly Operation:**

IQR's system is designed for both seasoned professionals and beginners. Even users without prior ROS (Robot Operating System) experience can easily operate the platform through its intuitive IQR Robot Control and Interaction Software.

**Comprehensive Software Support:**

The ROS ecosystem and pre-configured AI models like Yolo v11 and DeepSeek 8B are integrated for immediate deployment in applications such as security surveillance and inspection.

**Advanced Sensor Integration:**

IQR supports various high-performance sensors, including LiDAR, differential GPS, IMU, and depth cameras, delivering reliable data fusion for all research applications.

**Zero-Barrier Operation for All Use Cases**

The IQR multi-modal sensor module is engineered for seamless, rapid deployment. The plug-and-play design allows for quick

connection to mobile robots through standardized ports, requiring no complex software configuration. This ease of use is critical for getting research up and running swiftly. Whether you are in the lab, at the field, or in extreme environments, IQR is built to handle outdoor conditions like high and low temperatures and vibration without compromising stability.

**For Non-Robotics Users:**

IQR's integrated Robot Control and Interaction Software.

offers an accessible pathway for users unfamiliar with ROS. The pre-installed AI models are ready to deploy, making it ideal for industries looking to incorporate robotics without needing to delve into coding or system-level integration. With features like AI-powered object detection and semantic understanding, users can instantly apply the module to applications such as security patrols, automated inspections, and more.

**Full Stack Support: Bridging Research and Engineering**

IQR isn't just for robotics enthusiasts—it's built for seamless research and development across various fields. The system comes fully equipped with a ROS Noetic package, including key features such as laser scanning point cloud processing,

multi-sensor calibration, and obstacle avoidance algorithms. For research-focused users, the integration with NVIDIA Orin NX hardware and CUDA support ensures up to 100 TOPS of deep learning power for running complex algorithms.

This plug-and-play capability means no more time spent on sensor calibration or data synchronization. From high-performance LiDAR to IMUs and depth cameras, IQR integrates various sensor modalities into a unified framework, providing real-time multi-modal data fusion.

**Cost-Effective Industry Solutions**

IQR revolutionizes the traditional development model by cutting down the environmental perception system setup time by as much as 80%. For research teams, this means less time spent on hardware configuration and more focus on validating theories with pre-installed algorithms. For project application users, the rRobot Control and Interaction Software allows for quick adaptation to existing robots, significantly reducing the cost and time required for deployment.

Whether you're looking to deploy a single robot or multiple units, IQR ensures high scalability, low operational costs, and rapid

implementation. This solution is ideal for academic research, industry applications, and large-scale deployments alike.

**Tailored for Research and Development:**

- **Research Version**: Powered by the NVIDIA Orin NX, this version comes pre-configured with AI algorithms for high-performance computation, ensuring deep learning tasks are executed with efficiency. Whether you're testing new theories, building robotic models, or running complex simulations, IQR’s research platform offers unbeatable flexibility and performance.
- **Application Version**: Designed for industries that need quick deployment, this version includes all the essential hardware and software components needed for robust navigation, mapping, and real-time interaction. With features like multi-robot coordination, path planning, and obstacle avoidance, it’s ready to integrate into your existing projects with minimal setup.


## Product Specifications

| Feature | Application Version | Research Version |
|---|---|---|
| **Main Controller** | Automotive-grade AD10 controller (Orin Core) | NVIDIA Orin NX |
| **Hardware** | 64-line/32-line LiDAR, Differential GPS, IMU, Depth Camera | 64-line/32-line LiDAR, Differential GPS, IMU, Depth Camera |
| **Software** | Ubuntu 20.04, ROS Noetic, Python 3.8 | Ubuntu 20.04, ROS Noetic, Python 3.8 |
| **Pre-installed Apps** | Yolo v11, DeepSeek 8B, Robot Localization & Navigation | Yolo v11, DeepSeek 8B, Multi-robot Systems |

| Feature | Application Version | Research Version |
| --- | --- | --- |
| **Standard Ports** | USB3.0, Ethernet, HDMI, GMSL2 | USB3.0, Ethernet, HDMI, GMSL2 |

**Join the Robotics Revolution with IQR**

Whether you're in academia, research, or industry, IQR's multi-modal sensor module is designed to elevate your robotics projects, bringing innovative solutions that save time, reduce costs, and increase accuracy. Let IQR help you turn your ideas into reality—effortlessly. Start deploying today and discover how this cutting-edge technology can accelerate your research and applications in robotics and beyond.

For more information or to get started, visit our website or contact our global support team.