

SPECIFICATIONS

APID Edge Proof-of-Concept: Technical Overview

The APID Edge PoC validates BioNAV's patent-pending Adaptive Particle Identification & Detection methodology on low-power embedded hardware, demonstrating feasibility under constrained compute environments.

Specification Table

Category	Specification
Methodology	Captured/Filtered Air Particle AI/ML Analysis — Patent Pending (PCT/US2024/031776)
Edge Hardware	NVIDIA Jetson Orin Nano — CPU-level baseline demonstration
Imaging Inputs	USB microscopy, computer vision (Keyence, Cognex, Basler), laser/UV/IR, multispectral, borescope + IP video + File upload
Processing Mode	Fully offline edge processing; hybrid cloud-ready architecture
Detection Engine	YOLOv8-based with cumulative training architecture (prevents catastrophic forgetting)
Outputs	Customize dataset, particle classification labels, confidence scores, detection metadata, session reports
Reporting	Local reporting for licensee use; cloud-ready data stream for future platform integration
Target Users	Air handling manufacturers, licensed system integrators, OEM development teams

Why Low-Power Edge?

The PoC's CPU-bounded design is intentional. This approach:

Edge Advantage	Professional Description
Establishes Performance Floor	Validates methodology at minimum viable compute; production deployments on GPU/TPU/NPU will see 10–50x performance gains
Enables Field Deployment	Low power consumption supports portable, battery-powered, and remote installations
Proves Offline Capability	Core detection functions without cloud dependency—critical for industrial, mobile, and secure environments
Reduces Pilot Costs	Lower hardware investment for proof-of-concept testing before production commitment

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Manufacturer Value Proposition

Integrating APID into air handling products enables:

Immediate Capabilities:

- Real-time filter analysis + particle classification during product operation
- Customizable ALERT notification messaging based on actual debris analysis
- Differentiated product features for competitive positioning – “Custom” datasets
- Data-driven insights for product development and quality assurance

Future Cloud-Network Platform Eligibility:

Licensed manufacturers gain eligibility for participation in BioNAV's planned environmental health data platforms:

- **PatientShare™** — End-user mobile application aggregating environmental exposure data across multiple products and environments
- **EnviroShare™** — Cross-manufacturer data layer enabling unified exposure tracking for consumers

Platform participation terms and technical requirements will be shared with qualified licensees under NDA. Development timeline targets 2H 2026 for initial platform availability.

Licensing & Engagement

Pathway	Description
Manufacturer Licensing	Annual license for OEM APID integration
Integrator Partnership	Distribution rights + technical training
Technical Advisory	Implementation consulting, custom development
General Inquiries	Information requests, media, speaking

Contact Rob Freeman at info@bionav.com for questions or to schedule an appointment.



About BioNAV

BioNAV® Health & Wellness specializes in *Environmental Health Solutions*. Our patent-pending process is revolutionizing the way air (and gas) particle data is analyzed, leveraging network servers, edge devices, sensor-to-sensor integration, and their combinations. This innovative technology empowers air handling manufacturers to unlock new revenue streams while embracing personalized respiratory care for their customers. www.bionav.com

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