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NEX-G AUTOMATION LLP

FORKLIFT ANTI-COLLISION AI CAMERA

Edge Vision Pedestrian Detection & Voice Alert System

DOCUMENT	**Product User Manual**
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Installation Configuration Operation Integration Maintenance

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1. Product Overview

The **Nex-G Forklift Anti-Collision AI Camera System** is an intelligent edge-vision safety solution designed to prevent vehicle-pedestrian impacts in industrial environments. Utilizing embedded deep-learning algorithms, the system instantly recognizes human forms around material-handling equipment within a configurable 4-meter radius and delivers immediate spoken voice warnings via a high-volume (85–100 dB) integrated speaker—all without requiring ground personnel to carry wearable tags.

Key System Highlights:

- Deep-learning pedestrian recognition natively trained on complex plant floor datasets.
- Zero wearable hardware dependencies for site workers or visitors.
- Multi-language voice warnings (English, Hindi, Kannada, and regional variations).
- Bluetooth companion Android mobile application for rapid sensitivity and volume tuning.

2. Safety Information

> **Operator Responsibility:** The AI camera serves as an operator-assist driver awareness device. It does not replace standard safe driving practices, direct line-of-sight visual checks, or required plant speed limits.

- **Power Supply:** Connect exclusively to vehicle DC power systems rated between 12V and 24V DC. Verify polarity prior to powering.
- **Lens Care:** Keep the optical vision sensor lens clean from grease, mud, and heavy dust to ensure optimal detection metrics.
- **Speaker Decibel Warning:** The internal speaker outputs up to 100 dB. Ensure volume settings match ambient factory noise without causing acoustic distraction.

3. Technical Specifications

Parameter	Specification Details	Notes
Detection Method	Embedded Edge AI Vision Processing	Deep-learning human form recognition
Detection Distance	Up to 4.0 meters (Configurable)	Adjustable blind-spot detection radius
Audio Alert Output	High-Volume Built-in Speaker	85–100 dB configurable voice alerts
Camera Sensor	Industrial High-Dynamic Vision Sensor	Optimized for low-light & indoor glare
Configuration Interface	Android App via Bluetooth	Wireless volume, sensitivity & language setup
Supported Languages	English, Hindi, Kannada + Regional	Configurable spoken audio profiles
Vehicle Input Power	12V–24V DC	Direct vehicle electrical system connection
Enclosure Rating	IP54 Aluminum & ABS Housing	Dust and splash-resistant industrial casing
Mounting Hardware	Industrial Heavy-Duty Clamp Kit	Included for forklift overhead guard installation
Operating Temperature	−10°C to +55°C	Designed for cold storage and hot plants
Hardware Dependencies	Zero Worker Wearables Required	Protects all personnel without personal tags

4. Detection & Safety Flow

Real-time edge processing sequence from human entrance to operator audio warning:

01. Person Enters
Pedestrian enters configured 4m detection zone.

02. Edge AI Processing
Vision sensor recognizes human silhouette.

03. Voice Warning
Speaker outputs 85–100 dB spoken warning.

04. Driver Action
Forklift driver pauses vehicle to prevent impact.

5. Android Configuration Ecosystem

The camera system connects wirelessly via Bluetooth to an intuitive Android configuration app:

App Function	Operational Capability
Language Profile Selection	Toggle between English, Hindi, Kannada, and regional voice prompts to match local driver demographics.
Detection Sensitivity Tuning	Fine-tune edge vision algorithm thresholds to optimize detection under low lighting or metallic plant glare.
Volume Ceiling Control	Adjust spoken warning decibel output from 85 dB to 100 dB to overcome high ambient machinery noise.
Diagnostics & Updates	Inspect live camera feed bounding boxes, trace power diagnostics, and push wireless firmware upgrades.

6. Strategic Solution Advantages

Zero Wearable Dependency
Eliminates tag distribution, battery charging routines, and compliance failures for ground staff.

Rapid Clamp Mounting
Heavy-duty clamp kit enables fast, non-destructive installation onto forklift overhead guards.

Operator-Centric Flow
Spoken verbal alerts communicate danger directly without requiring drivers to glance at displays.

Multi-Site Fleet Scaling
Standardized hardware architecture supports rapid rollout across large materials-handling fleets.

7. Frequently Asked Questions (FAQ)

- **What does the AI camera detect?** Embedded deep learning specifically recognizes human bodies and forms.
- **What is the maximum detection range?** Up to 4 meters, fully adjustable via the companion Android application.
- **Does it require workers to wear a device?** No, edge vision operates natively without any worker tags.
- **What power supply does it require?** Standard vehicle 12V–24V DC input.

8. Troubleshooting Guide

Symptom	Possible Cause	Recommended Action
System does not power on	12V–24V DC power disconnected	Inspect wiring harness connection to vehicle ignition/battery and check inline fuse.
Delayed human detection	Dirty lens or heavy dust accumulation	Wipe vision lens gently using a micro-fiber cloth. Adjust sensitivity setting in Android App.
Voice alert inaudible during plant operation	Low volume setting	Connect via Bluetooth Android App and increase volume ceiling up to 100 dB.
App fails to connect via Bluetooth	Bluetooth disabled or out of range	Ensure phone Bluetooth is enabled and stay within 3 meters of the camera housing during setup.

9. Maintenance & Care

- Clean the camera optical glass daily prior to shift operation using a soft cloth to maintain vision clarity.
- Periodically inspect the structural mounting clamp bolts to ensure vibration resistance on rough terrain.
- Inspect power cables for chafing or pinching near the forklift mast or overhead guard frame.
- Store uninstalled units in a dry environment between −10°C and +55°C.

10. Support and Service Contact

For technical assistance, Android APK downloads, installation support, or fleet queries, contact Nex-G Automation LLP:

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