



NEX-G AUTOMATION LLP

UWB FORKLIFT ANTI-COLLISION WEARABLES SYSTEM

UWB-Based Proximity Alert & Vehicle Speed-Control Interface

DOCUMENT	Product User Manual
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Installation • Configuration • Operation • Relay Integration • Maintenance

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Document Control

Item	Details
Product	Nex-G UWB Forklift Anti-Collision Wearables System
Document purpose	General guidance for safe installation, configuration, operation, testing and maintenance.
Version	1.0
Prepared for	Safety managers, forklift operators, system integrators and maintenance teams.
Applicability	General guide. Exact device controls, charging method, relay ratings and vehicle interface vary by model.

Important: This manual is based on the product information provided for the Nex-G website. Confirm the exact model datasheet, relay contact ratings, wiring diagram, wearable charging instructions, mounting requirements and vehicle integration procedure before installation. Do not infer undocumented wiring or settings.

Contents

- 1. Product Overview
- 2. Safety Information
- 3. Features and Technical Specifications
- 4. System Components
- 5. Installation and Mounting
- 6. Configuration and Commissioning
- 7. Operating Modes and Relay Integration
- 8. Daily Operation and Charging
- 9. Testing and Validation
- 10. Troubleshooting
- 11. Maintenance and Storage
- 12. Frequently Asked Questions
- 13. Support and Service

1. Product Overview

The Nex-G UWB Forklift Anti-Collision Wearables System is designed to detect proximity between pedestrians and industrial vehicles such as forklifts. A pedestrian wears a UWB-enabled tag, while a receiver is mounted on the forklift. When a tag enters a configured detection zone, the system can activate audible and visual warnings and provide relay outputs for compatible vehicle control circuitry.

The stated detection range is configurable from 1 to 10 metres, with specified proximity accuracy of ± 20 cm and system response latency below 200 ms. Actual performance can be affected by installation, device orientation, environment, configuration and the specific model.

Typical applications

- Warehouse and fulfilment-centre forklift routes.
- Pedestrian crossings and shared vehicle–person work areas.
- Automotive, manufacturing, logistics and material-handling facilities.
- Industrial yards, cold-chain warehousing and selected construction/mining applications.
- Warning and compatible relay-interface applications for vehicle speed reduction or engine cut-off, subject to vehicle manufacturer approval.

Safety limitation: This product is an aid to risk reduction, not a substitute for safe driving, training, marked walkways, speed limits, mirrors, cameras, supervision or a site traffic-management plan. Do not rely on it as the sole protective measure.

2. Safety Information

- **Qualified installation:** Installation and vehicle integration must be completed by competent personnel familiar with industrial vehicles, electrical systems and site safety procedures.
- **Vehicle controls:** Never connect relay contacts to engine, traction, braking or speed-control circuits without written approval and an engineered interface from the forklift/vehicle manufacturer or authorized integrator.
- **Fail-safe design:** Define the safe state for loss of power, communication, tag battery, relay failure or receiver fault. Validate the response under controlled conditions.
- **Do not bypass safeguards:** Do not bypass, disable or modify factory-installed vehicle safety interlocks or protective systems.
- **Audible output:** The stated siren output is 90–110 dB. Avoid close-range exposure and use suitable hearing protection during tests.
- **Mounting:** Secure the receiver so it cannot detach, obstruct the operator's view, interfere with controls or be damaged during normal vehicle operation.
- **Charging:** Use only the charger and charging procedure approved for the wearable model. Keep charging connectors dry and inspect them for damage.
- **Environmental limits:** The stated operating temperature range is -10°C to $+60^{\circ}\text{C}$. Confirm model-specific limits and avoid use outside them.
- **Zone testing:** Notify affected personnel before testing alerts or relay actions so a test is not mistaken for an actual danger condition.

3. Features and Technical Specifications

Parameter	Published information	Notes
Detection technology	Ultra-Wideband (UWB)	IEEE 802.15.4 compliant as specified in supplied product content
Detection range	1–10 m	Configurable; confirm setup method for exact model
Proximity accuracy	±20 cm	Specified accuracy; real-world results depend on environment and installation
System latency	<200 ms	Specified response latency; validate in the deployed configuration
Alert outputs	Audible siren and visual LEDs	Siren output specified at 90–110 dB
Relay outputs	2 × potential-free contacts	NO/NC contacts; verify contact ratings and terminal assignment
Wearable charging	USB-C / magnetic charger	Charging option depends on supplied wearable
Wearable battery life	Up to 5 days as specified	Actual life depends on usage, settings, battery condition and model
Enclosure	Anodized aluminium alloy; IP54 stated	Confirm rating for each component and installed connectors
Mounting	Wearable: waist belt; receiver: magnetic/bracket	Use the approved mounting method for the exact model
Vehicle compatibility	Relay-compatible controllers	Integration requires compatibility review and approved interface
Operating temperature	–10°C to +60°C	Verify exact component limits
Wireless dependencies	No local Wi-Fi / GPS dependency stated	UWB communication is used for proximity detection

Specifications: Product-page values are not a substitute for the controlled datasheet. Confirm relay voltage/current ratings, tag/receiver quantities, UWB channel/region settings, alarm thresholds, IP rating per component and battery details before deployment.

4. System Components

Component	Role	Checks before use
UWB wearable tag	Carried by a pedestrian to participate in proximity detection.	Confirm tag identity, battery/charge state, physical condition and correct wearing position.
Forklift-mounted receiver	Detects nearby compatible UWB tags and processes proximity conditions.	Confirm secure mounting, power, configuration and unobstructed placement.
Audible siren	Warns operators and/or nearby personnel of a proximity condition.	Confirm sounder operation and suitable audibility in the work area.
Visual LEDs	Provides a visual indication of system or proximity status.	Confirm indicators are visible from intended operator positions.
Dual relay outputs	Provides potential-free NO/NC contacts for compatible external control interfaces.	Verify contact rating, wiring diagram, relay logic and approved vehicle interface.
Charger	Recharges the wearable where the supplied model is rechargeable.	Use the specified USB-C or magnetic charger for that model.

5. Installation and Mounting

5.1 Site preparation

- Identify pedestrian routes, forklift travel paths, intersections, blind corners, loading areas and other high-risk zones.
- Perform a site risk assessment and select an initial detection range within the stated 1–10 m range.
- Confirm the number of tags and receivers required and how each unit will be identified.
- Agree on the alert response and any vehicle-control actions with the safety team and vehicle manufacturer/authorized integrator.
- Record the intended test plan and inform operators and pedestrians before commissioning.

5.2 Wearable tag

- Charge the tag according to the supplied model instructions before first use.
- Inspect the enclosure and charging port/contacts for damage or contamination.
- Wear the tag securely at the intended waist-belt position, with the orientation recommended by the manufacturer.
- Ensure the tag is assigned to the intended worker or role where identification is supported.
- Do not cover, modify, dismantle or attach the tag in a way that affects its operation.

5.3 Forklift receiver

- Park the forklift safely, apply the parking brake and isolate power as required by the vehicle service procedure.
- Mount the receiver using the specified magnetic or bracket method, ensuring it is secure and protected from impact.
- Choose a location that does not obstruct the operator's sightline, controls, access, service panels or other safety devices.
- Route and secure cables according to the approved wiring diagram, away from moving parts, heat, pinch points and sharp edges.
- Connect the power and any relay interface only according to the model-specific wiring diagram and approved vehicle integration plan.

Do not guess relay wiring: This manual does not specify terminal numbers, wire colours, relay contact ratings, receiver supply voltage or the logic required to reduce speed or stop a vehicle. Obtain the official wiring diagram and have the vehicle interface approved before connection.

6. Configuration and Commissioning

6.1 Inventory the system

Record model/serial identifiers for each tag, receiver and accessory. Inspect all units for damage.

6.2 Charge and power up

Charge wearables using the specified charger and power the receiver according to its model instructions.

6.3 Pair or register tags

If the system requires pairing, registration or tag enrolment, follow the supplied configuration guide. Do not assume a default pairing procedure.

6.4 Set the detection zone

Configure the intended range within the specified 1–10 m range using the approved setup method.

6.5 Configure alert behaviour

Confirm how audible and visual warnings respond to proximity and how the system indicates clear/normal conditions.

6.6 Review relay logic

Confirm the purpose of each potential-free relay, its NO/NC behaviour, contact rating and the approved downstream interface.

6.7 Validate safe response

Test the system in a controlled area with the forklift stationary first, then follow the site-approved staged test plan.

6.8 Document acceptance

Record configuration, range, test results, known limitations, responsible persons and the date of commissioning.

Commissioning checklist

- Tags charged and identified ■ Receiver mounted securely
- Detection range configured ■ Audible and visual alerts tested
- Relay contact ratings and wiring verified ■ Vehicle interface approved
- Failure modes and safe state tested ■ Operators trained and informed

7. Operating Modes and Relay Integration

Function	Purpose	Important considerations
Proximity warning	Responds when a pedestrian tag enters the configured zone.	Confirm the zone threshold and test approach paths relevant to the site.
Audible alert	Produces a high-decibel warning when configured conditions are met.	Validate audibility without exposing workers to unnecessary sound levels.
Visual warning	LEDs indicate a proximity or system condition, depending on model.	Confirm the meaning of each LED from the official device guide.
Speed reduction	Relay interface may signal compatible vehicle control circuitry.	Requires vehicle-manufacturer/authorized-integrator approval and safe functional validation.
Engine cut-off	Relay interface may be used in supported vehicle architectures.	Do not implement as a generic direct connection; assess safe stopping, load and operational hazards.
Dual relay output	Two potential-free NO/NC contacts support separate compatible functions where configured.	The role of each relay and its electrical limits must be documented for the exact model.

7.1 Relay integration principles

- Potential-free contacts provide switching contacts; they do not, by themselves, establish that a circuit is safe or compatible.
- Use an engineered interface suitable for the vehicle's control voltage, current, inductive loads and required isolation.
- Determine the correct NO/NC contact state from the official wiring diagram and intended safety logic.
- Define behaviour during power loss, broken wiring, stuck contacts, tag failure, receiver fault and communication loss.
- Test the system so that normal vehicle operation is not unexpectedly interrupted and the intended risk-reduction response is verified.
- Document the final interface schematic and obtain approval from the responsible safety and vehicle engineering personnel.

Critical: The UWB system must not be assumed to be a certified safety-rated control system. A relay output alone does not guarantee a safe stop. Vehicle speed reduction or engine cut-off must be engineered, risk-assessed and validated for the specific forklift and operating conditions.

8. Daily Operation and Charging

Before each shift

- Check the wearable tag for visible damage and confirm adequate charge.
- Confirm the worker is wearing the tag in the prescribed position.
- Check receiver mounting, visible indicators and power status according to the model instructions.
- Perform the site's approved functional check in a controlled area.
- Report any fault, missing tag, low-battery indication or unexpected alert behaviour before operating in the risk area.

Charging

- Use only the supplied or approved USB-C/magnetic charging method applicable to the exact model.
- Follow the manufacturer's charging time, indicator meanings and battery handling instructions.
- Keep charging ports/contacts clean and dry; do not charge a damaged or unusually hot unit.
- Do not leave charging devices where they can be run over, exposed to liquids or create a trip hazard.
- The product page states a wearable battery life of 5 days; plan charging frequency based on actual shift length and observed battery performance.

9. Testing and Validation

A commissioning and periodic test plan should verify both detection performance and the complete response chain. Tests should be conducted by authorized personnel in a controlled area, with affected workers informed.

Test	Suggested verification
Tag recognition	Confirm the receiver detects each enrolled tag according to the official procedure.
Range test	Check detection at representative distances within the configured 1–10 m range; document the test conditions.
Approach-direction test	Test representative approaches, crossings and orientations relevant to the site layout.
Audible/visual warning	Confirm the expected sound and LED response at the configured proximity threshold.
Relay operation	Verify each relay contact using an approved test method before connection to vehicle control circuitry.
Vehicle integration	Conduct only under the approved engineering and safety test plan; verify intended response and safe recovery.
Fault response	Test approved failure scenarios such as low battery, loss of power or fault indication where the design permits.
Record keeping	Record date, configuration, results, deviations, corrective actions and tester.

Repeat testing after relocation, configuration changes, firmware changes, vehicle-interface changes or any event that may affect detection or mounting.

10. Troubleshooting

Symptom	Checks / recommended action
Wearable does not power on	Charge with the approved charger and inspect the unit. If it remains unresponsive, remove it from service and contact support.
Tag battery drains quickly	Review charging completion, age/condition, use pattern and configuration; compare with the model's specified battery performance.

Symptom	Checks / recommended action
Receiver does not detect a tag	Confirm the tag is powered and registered/paired if required, check configuration and test within the configured range.
Detection range seems incorrect	Verify the configured threshold, mounting, tag orientation and test environment; record repeatable test results.
Audible alert does not sound	Check the model's power/status indications and configuration. Confirm the sounder is enabled and seek service if unresolved.
LED behaviour is unclear	Refer to the exact model's indicator table; do not infer meanings from colour alone.
Relay output does not operate	Verify configuration, terminal assignment and relay contact state using the official diagram and a safe isolated test.
Vehicle control response is wrong	Stop using the relay integration, make the vehicle safe, isolate the system as required and have the authorized integrator investigate.
Receiver is loose or damaged	Remove the vehicle from the affected operation if necessary and secure/replace the mounting using the approved method.

Stop and escalate: If the system behaves unpredictably, fails a required safety test, or causes unintended vehicle response, take the affected equipment out of service according to site procedures until inspected and approved.

11. Maintenance and Storage

- Inspect tags, receiver housing, mounting hardware, cables and connectors at intervals defined by the site's maintenance plan.
- Clean the exterior with a soft cloth; follow the manufacturer's cleaning guidance and keep charging contacts dry.
- Do not open the enclosure, modify the antenna, alter relay wiring or repair internal battery components unless authorized.
- Check the wearable battery condition and charging performance; replace only with an approved part and service procedure.
- Verify receiver mounting and system response after impacts, repairs, vehicle changes or relocation.
- Keep firmware/configuration records and update them only through approved procedures.
- Store unused units in the conditions specified by the manufacturer and protect them from impact, moisture and extreme temperatures.

12. Frequently Asked Questions

What technology does the system use?

Ultra-Wideband (UWB) proximity detection, as specified in the supplied product information.

What is the detection range?

The stated configurable range is 1–10 metres. Confirm the actual settings and test the deployed installation.

What alerts are provided?

The product information specifies audible siren output of 90–110 dB and visual LEDs.

Can it interface with forklift control systems?

The receiver provides two potential-free NO/NC relay contacts for compatible interfaces. The vehicle integration must be engineered and approved.

Can the relays be used for speed reduction or engine cut-off?

The product content describes these as possible applications where the vehicle control architecture supports them. They are not plug-and-play functions for every forklift.

Does it require Wi-Fi or GPS?

The described proximity architecture uses UWB and does not depend on local Wi-Fi or active outdoor GPS for the stated detection function.

How are devices mounted and charged?

The wearable is intended for waist-belt mounting; the receiver uses a specified magnetic or bracket mount. Charging may be USB-C or magnetic, depending on model.

What is the operating temperature range?

The stated range is -10°C to $+60^{\circ}\text{C}$. Verify the limits for each component in the actual system.

13. Support and Service

For the current datasheet, installation drawing, tag registration procedure, charging guide, relay terminal map, vehicle integration review or service assistance, contact Nex-G Automation LLP.

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When contacting support, provide: product model/serial number, tag/receiver identifiers, installation location, configuration, observed behaviour, test conditions and photographs where safe to obtain. Do not send passwords or confidential site credentials.

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