NEX-G
ISO 9001:2015

## NEX-G AUTOMATION LLP

# SMART TAP EQUIPMENT MANAGEMENT SYSTEM

### NFC & QR Digital Inspection Ecosystem & Compliance Trail Platform

| | |
|---|---|
| **DOCUMENT** | **Product User Manual** |
| **DOCUMENT VERSION** | **1.0** |
| **ISSUE DATE** | **27 October 2026** |
| **PRODUCT CATEGORY** | **Smart Equipment Inspection / Mobile Safety Compliance** |

**Installation** **Configuration** **Operation** **Integration** **Maintenance**

## Contents


1. Product Overview
2. System Operation Guidelines
3. Technical Architecture Specs
4. Inspection Workflow & Flow
5. REST API & JSON Communication
6. Web Admin Dashboard Controls
7. Offline Buffer & Sync Engine
8. Key Strategic Solution Advantages
9. Deployment Applications
10. Troubleshooting Matrix
11. Frequently Asked Questions
12. Support & Service Contact



Head Office: 3, 1st Floor, Hubli-Dharwad Road, Opp. Shiva Temple, Shivagiri, Hubballi, Karnataka 580031
Phone: +91 89045 95334 | Email: sales@nexgautomation.com
Website: www.nexgautomation.com

## 1. Product Overview

The **Nex-G Smart Tap Equipment Management System** is a comprehensive hybrid inspection platform designed to digitize safety compliance trails and asset maintenance routines. Bridging a centralized browser-based Web Admin Dashboard with a native Android inspector client application, the system uses dual NFC badge-tap validation and QR code optical backups to verify inspector presence, record dynamic checklist parameters, and maintain offline local log buffers in zero-connectivity plant areas.

**Core Hardware & Software Architecture:**

- NFC tap validation for instant inspector login and dual-token asset identification.
- QR code optical matrix backup for secondary identification across all machinery assets.
- Asynchronous offline local buffering for seamless audit data entry without network reception.
- PHP/MySQLi relational web backend communicating via structured REST JSON APIs.
- Native Java/XML Android mobile application optimized for rugged field tablets.

## 2. System Guidelines & Operation

> **Security Notice:** Ensure inspector NFC badges are provisioned strictly through the Web Admin Dashboard. Unassigned or revoked NFC badges will be rejected by the Android inspector application.

- **Inspector Verification:** Field personnel must tap their physical NFC badge against the mobile device to unlock the auditing interface.
- **Offline Data Protection:** Checklist logs stored in local device memory will automatically sync once a Wi-Fi or cellular link is established.
- **Tag Maintenance:** Ensure industrial physical NFC tags attached to machinery are kept clean and free from heavy metallic shielding.

## 3. Technical Architecture Specifications

| Layer / Component | Specification Details | Notes |
|---|---|---|
| **Web Admin Frontend** | HTML5, CSS3, JavaScript, Bootstrap | Responsive browser dashboard interface |
| **Web Backend Framework** | PHP with MySQLi Relational Database | Secure multi-tenant asset records architecture |
| **Mobile Field Application** | Native Java / XML Android Client | Lightweight field application for Android tablets/phones |
| **Identification Engine** | Android NFC API & Embedded QR Scanner | NFC tap validation with optical QR backup |
| **Data Communication Protocol** | REST API over HTTPS (PHP + JSON) | Encrypted lightweight data payload transmission |
| **Database Schema** | MySQLi Relational Asset & Mapping Logs | Auditable relational records schema |
| **Server Hosting Node** | Centralized Scalable Cloud Infrastructure | Real-time cloud availability and auto-backup |
| **Inspector Authentication** | NFC Badge-Tap Operator Protocols | Tamper-proof inspector login verification |
| **Offline Capabilities** | Asynchronous SQLite / Local Buffer Engine | Zero-connectivity checklist queueing |
| **Paperwork Reduction** | 100% Zero Manual Inspection Paperwork | Fully digitized end-to-end audit trails |

## 4. Inspection Workflow & Flow

Sequence from inspector badge-tap verification to synchronized cloud administrative records:

**01. Inspector Tap**
Field technician taps NFC badge to log into Android app.

**02. Asset Scan**
NFC tag or backup QR code identifies the target machine.

**03. Form Capture**
Custom checklists, condition flags & text remarks entered.

**04. Cloud Sync**
Offline logs sync via REST API to Web Admin Dashboard.

## 5. Web Admin Dashboard & Mobile Controls

Centralized administration features available through the browser-based Web Admin portal:

| Management Function | Operational Capabilities |
|---|---|
| **Inspector Account Controls** | Create, update, and revoke inspector access credentials and bind physical NFC badge IDs to user profiles. |
| **NFC / QR Smart Linker** | Bind physical NFC smart tags or generated QR matrix codes to machinery assets in a single step. |
| **Dynamic Checklist Builder** | Customize inspection parameters, pass/fail checkboxes, numeric inputs, and text fields by asset class. |
| **Analytics & Audit Reports** | Export verified historical inspection sets to CSV or PDF administrative logs for compliance review. |

## 6. Strategic Solution Advantages

**100% Operational Traceability**
Tracks precisely when, where, and by whom every equipment safety loop was evaluated.

**Zero Manual Paperwork**
Replaces error-prone paper checklists with synchronized, audit-ready relational logs.

**Asynchronous Offline Sync**
Buffers inspection data locally in underground or shielded plant zones until connectivity returns.

**Dual-Token Reliability**
Combines fast NFC badge tap verification with secondary optical QR code backups.

## 7. Frequently Asked Questions (FAQ)

- **What identification methods are supported?** NFC smart tags with secondary QR code optical backup matrix.
- **Is there a mobile inspector application?** Yes, a native Android Java/XML application optimized for field tablets and phones.
- **Can inspections be recorded without internet reception?** Yes, the app buffers checklists locally and syncs automatically when online.
- **How does the mobile client communicate with the backend?** Secure REST API using PHP and structured JSON payloads.

## 8. Troubleshooting Guide

| Symptom | Possible Cause | Recommended Action |
|---|---|---|
| **NFC badge tap rejected on Android app** | Unregistered badge / NFC disabled | Ensure device NFC is switched ON; verify badge ID is provisioned in Web Admin Dashboard. |
| **Asset tag scan fails to open checklist** | Tag unlinked or damaged | Scan using secondary QR code backup; re-bind NFC tag to asset via Web Admin Smart Linker. |
| **Offline logs not syncing to cloud** | No active network connection | Check Wi-Fi or cellular signal bar status; trigger manual sync button in Android app settings menu. |
| **REST API connection error (HTTP 500/403)** | Invalid API key / server offline | Verify cloud server node status and check REST API endpoint URL in application configuration file. |

## 9. Maintenance & Care

- Inspect physical NFC asset tags and QR code stickers periodically for chemical exposure or mechanical wear.
- Ensure Android field tablets/phones are updated with the latest native Smart Tap APK release.
- Perform regular cloud database backups via the Web Admin Dashboard maintenance panel.
- Keep physical inspector NFC badges clean and store unassigned tags in a protective non-metallic sleeve.

## 10. Support and Service Contact

For technical support, custom checklist form design, REST API documentation, or deployment assistance, contact Nex-G Automation LLP:

| | |
|---|---|
| **Company Name** | Nex-G Automation LLP |
| **Head Office** | 3, 1st Floor, Hubli-Dharwad Road, Opp. Shiva Temple, Shivagiri, Hubballi, Karnataka 580031 |
| **Telephone** | +91 89045 95334 |
| **Email Support** | sales@nexgautomation.com |
| **Official Website** | www.nexgautomation.com |

**— End of Document —**