

LPG Tamale System - Roles and Permissions

Overview

The LPG Tamale system has two distinct user roles with different levels of access and responsibilities:

1. **Admin** - System administrators with full control
2. **Station Manager** - Individual station operators with limited permissions





User Roles

1. ADMIN ROLE




Description: System administrators who manage the entire LPG distribution network across Tamale.

Permissions & Capabilities:





Station Management

-  **View all stations** - See complete list of all LPG stations in the system
-  **Add new stations** - Create new LPG station entries with:
 - Station name, address, contact details (phone, email)
 - Operating hours and pricing information
 - GPS location (latitude/longitude) using map picker
 - Station image
 - Initial availability status
-  **Edit stations** - Modify any station's information including:
 - Basic details (name, address, contact)
 - Operating hours and price per kg
 - Location coordinates
 - Availability status
 - Station image
-  **Delete stations** - Remove stations from the system
 - Note: Deleting a station also removes associated station manager accounts




User Management

-  **View all station managers** - See all station manager accounts
-  **Create station manager accounts** - Add new users with:
 - Full name and email
 - Login password
 - Assignment to a specific station (one manager per station)
-  **Delete station managers** - Remove user accounts from the system
- × **Cannot modify passwords** - Password changes not implemented yet

Monitoring & Analytics

-  **Dashboard statistics** - View real-time metrics:
 - Total number of stations
 - Available stations count
 - Unavailable stations count
 - Total station manager accounts
-  **Station availability tracking** - Monitor which stations have LPG in stock
-  **Location viewing** - See GPS coordinates of all stations
-  **Price monitoring** - View current price per kg at each station

System Access



-  **Admin dashboard** - Access to `/admin` route
 -  **Full system visibility** - Can see and manage all resources
 -  **Cannot access station manager dashboard** - Role-restricted
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2. STATION MANAGER ROLE

Description: Individual users assigned to manage a specific LPG station's availability status.



Permissions & Capabilities:

Station Status Management

-  **Toggle LPG availability** - Mark station as Available/Unavailable
 - Primary function: Update when LPG is in stock or out of stock
 - Triggers automatic timestamp update
-  **View own station details** - See information for assigned station only:
 - Station name and address
 - Contact information
 - Operating hours
 - Current availability status
 - Last updated timestamp

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Monitoring

-  **Dashboard access** - Limited dashboard showing:
 - Current station status (Available/Unavailable)
 - Last update time
 - Operating hours
 - Quick toggle button for availability
-  **Status update confirmation** - Visual feedback when toggling availability

Restrictions

- × **Cannot view other stations** - Access limited to assigned station only
- × **Cannot modify station details** - No ability to change:
 - Name, address, contact information
 - Operating hours
 - Pricing
 - Location coordinates
 - Station image
- × **Cannot create or delete stations** - No station management rights
- × **Cannot manage users** - No access to user management
- × **Cannot access admin dashboard** - Role-restricted to **/station** route
- × **Cannot change own password** - Not implemented yet
- × **Cannot view analytics** - No access to system-wide statistics

System Access

- ☒ **Station dashboard** - Access to **/station** route
- × **No admin access** - Cannot access **/admin** route

Role Comparison Matrix

Feature	Admin	Station Manager
View all stations	<input checked="" type="checkbox"/> Yes	× No (own only)
Add stations	<input checked="" type="checkbox"/> Yes	× No
Edit station details	<input checked="" type="checkbox"/> Yes	× No
Delete stations	<input checked="" type="checkbox"/> Yes	× No
Toggle availability	<input checked="" type="checkbox"/> Yes (all)	<input checked="" type="checkbox"/> Yes (own only)
Create users	<input checked="" type="checkbox"/> Yes	× No
Delete users	<input checked="" type="checkbox"/> Yes	× No
View system stats	<input checked="" type="checkbox"/> Yes	× No
Access admin dashboard	<input checked="" type="checkbox"/> Yes	× No
Access station dashboard	× No	<input checked="" type="checkbox"/> Yes
View location coordinates	<input checked="" type="checkbox"/> Yes	× No
Update pricing	<input checked="" type="checkbox"/> Yes	× No
Change passwords	× Not implemented	× Not implemented

Authentication & Access Control

Login Process

1. Users log in with email and password
2. System validates credentials
3. User role is determined from account
4. Redirected to appropriate dashboard:
 - **admin** role → **/admin** dashboard
 - **station** role → **/station** dashboard

Route Protection

- **Admin routes** (**/admin**): Only accessible by users with **role: 'admin'**
- **Station routes** (**/station**): Only accessible by users with **role: 'station'**
- Unauthorized access attempts redirect to **/login**

Session Management

- Authentication state persisted using Zustand
- Users remain logged in across page refreshes
- Logout clears authentication state and redirects to home

Workflows by Role

Admin Workflow

Adding a New Station

1. Navigate to Admin Dashboard
2. Click "Add Station" button
3. Fill in station details:
 - Name, address, phone, email
 - Operating hours and price per kg
 - Click "Get Location" or manually enter coordinates
 - Select location on map
 - Optionally add station image URL
 - Set initial availability status
4. Submit form
5. Station appears in stations list

Creating a Station Manager

1. Navigate to "Users" tab in Admin Dashboard
2. Click "Add User" button
3. Enter manager details:
 - Full name and email
 - Create password
 - Assign to specific station
4. Submit form
5. Manager can now log in and manage their station

Monitoring Station Availability

1. View dashboard statistics (available/unavailable counts)
 2. Browse stations table
 3. See real-time status badges
 4. Click location links to view on map
 5. Edit or delete stations as needed
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Station Manager Workflow

Daily Operations

1. Log in to Station Dashboard
2. View current availability status
3. When LPG stock changes:
 - Click "Mark as Unavailable" (if LPG runs out)
 - Click "Mark as Available" (when LPG is restocked)
4. System automatically updates timestamp
5. Change is immediately visible to customers on public site

Monitoring

- Check "Last Updated" time to see when status was last changed
 - Verify operating hours displayed correctly
 - View current availability badge (green = available, red = unavailable)
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Database Role Mapping

Users Table

```
CREATE TABLE users (  
  id UUID PRIMARY KEY,  
  email VARCHAR(255) UNIQUE NOT NULL,  
  password_hash VARCHAR(255) NOT NULL,  
  name VARCHAR(255) NOT NULL,  
  role VARCHAR(20) CHECK (role IN ('admin', 'station')),  
  station_id UUID REFERENCES stations(id), -- NULL for admins  
  is_active BOOLEAN DEFAULT true,  
  created_at TIMESTAMP DEFAULT NOW(),  
  updated_at TIMESTAMP DEFAULT NOW()  
);
```

Constraints:

- `role` must be either `'admin'` or `'station'`
- `station_id` must be NULL for admin users

- `station_id` must be set for station manager users
 - One unique station manager per station (enforced by unique index)
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Security Considerations

Current Implementation

- ☒ Role-based route protection
- ☒ Frontend role validation
- ☒ Password storage (basic, needs backend hashing)
- ☒ Session persistence

Recommended Enhancements for Backend

1. Password Security

- Hash passwords with bcrypt/argon2
- Implement password reset functionality
- Enforce strong password policies

2. JWT Authentication

- Use JWT tokens for API requests
- Include role in token claims
- Implement token refresh mechanism

3. API Authorization

- Validate user role on every backend request
- Prevent station managers from accessing other stations' data
- Implement rate limiting

4. Audit Logging

- Track who makes availability changes
- Log station modifications
- Monitor user creation/deletion

5. Multi-factor Authentication (MFA)

- Optional for admin accounts
- SMS/Email verification

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Future Role Enhancements

Potential Additional Roles

1. **Super Admin** - Manage admin accounts and system settings
2. **Customer Support** - Read-only access to all data, can update contact info

3. **Analyst** - Access to reports and analytics only
4. **Regional Manager** - Manage stations within a specific region

Potential Permission Additions

1. Station Managers:

- Update own station's operating hours
- Update pricing (with admin approval)
- View basic analytics (customer views, status change history)
- Upload station photos
- Respond to customer reviews/feedback

2. Admins:

- Bulk import/export stations
- Generate reports (availability trends, pricing analysis)
- Configure system settings
- Manage user permissions granularly
- View audit logs
- Send notifications to station managers

Default Accounts

Sample Admin Account

- **Email:** `admin@tamalelpg.com`
- **Name:** System Administrator
- **Role:** `admin`
- **Station:** None (NULL)

Sample Station Manager

- **Email:** `central@tamalelpg.com`
- **Name:** Central Station Manager
- **Role:** `station`
- **Station:** Tamale Central Gas Station

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Support & Documentation

For technical questions about roles and permissions:

- Review this document
- Check database schema in `database-schema.sql`
- Review frontend code in `src/app/admin/` and `src/app/station/`
- Contact system administrator

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