

# LPG Tamale System - Roles and Permissions

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## 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
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## 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

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##### 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
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## Role Comparison Matrix

Feature	Admin	Station Manager
<b>View all stations</b>	<input checked="" type="checkbox"/> Yes	✗ No (own only)
<b>Add stations</b>	<input checked="" type="checkbox"/> Yes	✗ No
<b>Edit station details</b>	<input checked="" type="checkbox"/> Yes	✗ No
<b>Delete stations</b>	<input checked="" type="checkbox"/> Yes	✗ No
<b>Toggle availability</b>	<input checked="" type="checkbox"/> Yes (all)	<input checked="" type="checkbox"/> Yes (own only)
<b>Create users</b>	<input checked="" type="checkbox"/> Yes	✗ No
<b>Delete users</b>	<input checked="" type="checkbox"/> Yes	✗ No
<b>View system stats</b>	<input checked="" type="checkbox"/> Yes	✗ No
<b>Access admin dashboard</b>	<input checked="" type="checkbox"/> Yes	✗ No
<b>Access station dashboard</b>	✗ No	<input checked="" type="checkbox"/> Yes
<b>View location coordinates</b>	<input checked="" type="checkbox"/> Yes	✗ No
<b>Update pricing</b>	<input checked="" type="checkbox"/> Yes	✗ No
<b>Change passwords</b>	✗ 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
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## 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

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#### 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

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```
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

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- 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
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## Default Accounts

### Sample Admin Account

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

### Sample Station Manager

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- **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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