Project Name: Chitti - Remote Robot Management

Team Name: Dread Fuel

User Guide: Dashboard for Remote Robot Management Cloud System

This guide explains how to use the dashboard, access its features, and answers frequently asked questions (FAQs).

Accessing the Dashboard

1. Open the web app in your browser (URL provided by your administrator).
2. Register for an account if you are a new user:
    - Enter your full name, email, password, and create a 4-digit passkey.
    - Your device's IP address will be registered for security.
3. Log in with your email and password.
4. Complete the security check:
    - Enter your 4-digit passkey.
    - Confirm your current IP matches your registered IP.
    - Complete the "I am not a robot" checkbox.
5. Upon successful login, you will be redirected to the dashboard.

Dashboard Features Overview

1. Real-Time Robot Monitoring

- **Live Telemetry Panel:** Continuously displays the robot’s current position (coordinates), speed, battery percentage, and operational status (RUNNING, CHARGING, OFFLINE).
- **Map Integration:** Shows the robot’s location on an interactive map. The path is updated in real time as the robot moves, and you can zoom or pan the map for better visibility.
- **Kinematics & Path Logging:** Visualizes the robot’s movement history, including distance traveled and recent waypoints.
- **User Actions:**

    - Observe the robot's current and historical positions.
    - Monitor speed and battery to anticipate charging needs.
    - Use the map to track the robot's route and coverage area.

2. 3D Robot Visualization

- **3D Model Display:** Renders a real-time, interactive 3D model of the robot using Three.js.
- **Joint State Visualization:** Shows the current angles and positions of key robot joints (shoulder, arm, forearm, hand).
- **Camera Controls:** Rotate, zoom, and pan the 3D view to inspect the robot from different angles.
- **User Actions:**
    - Watch the robot's posture and movement update as it operates.
    - Inspect joint states for diagnostics or demonstration.
    - Use mouse or touch gestures to manipulate the 3D view.

3. Charts and Analytics

- **Distance Chart:** Bar chart showing the distance covered in each session or run.
- **Efficiency Chart:** Line chart displaying efficiency metrics (e.g., meters per battery percentage used).
- **Cycle Count:** Displays the number of operational cycles completed by the robot.
- **User Actions:**
    - Analyze trends in robot performance over time.
    - Identify periods of high or low efficiency.
    - Use data for maintenance planning or reporting.

4. Remote Commands and Tele-Operation

- **Keyboard Controls:** Use WASD keys for movement, Shift for running, and other keys for joint manipulation (T/G/Y/H/U/J/I/K).
- **Power Controls:** Toggle the robot's system power ON/OFF from the dashboard.
- **Emergency Stop:** Use the emergency key (E) to halt the robot immediately.
- **User Actions:**
    - Drive the robot remotely in real time.
    - Adjust robot posture or arm position for tasks.
    - Power cycle the robot or trigger emergency stop as needed.

5. System Health and Diagnostics

- **Battery Monitoring:** Visual indicator and percentage label for battery status.
- **Temperature and Voltage:** Real-time display of system temperature and voltage.
- **Cycle Counter:** Shows the number of charge/discharge cycles completed.
- **Alerts and Status:** Visual overlays for critical events (e.g., low battery, system offline).
- **User Actions:**
    - Monitor health parameters to prevent downtime.

    - Respond to alerts by charging or servicing the robot.

6. Firmware Updates (if enabled)

- **Update Checker:** Notifies you when new firmware is available.
- **Progress Bar:** Visual feedback during firmware download and installation.
- **Reboot Notification:** Informs you when the robot is rebooting after an update.
- **User Actions:**
    - Initiate firmware updates from the dashboard.
    - Monitor update progress and confirm completion.

7. Session and Security Management

- **Session Timeout:** Automatic logout after inactivity or browser navigation.
- **IP-Based Locking:** Only allows access from your registered IP address.
- **CAPTCHA Verification:** Ensures only human users can log in.
- **User Actions:**
    - Log out securely when finished.
    - Contact support if locked out due to IP change.

8. Data Export and Logging

- **Download Logs:** Export recent telemetry and activity data as a JSON file for analysis or record-keeping.
- **User Actions:**
    - Download logs for troubleshooting, compliance, or reporting.

Frequently Asked Questions (FAQs)

Q1: I can't log in. What should I check?

- Ensure your email, password, and passkey are correct.
- Your current IP address must match your registered IP. If your network changed, contact your administrator.
- Complete the "I am not a robot" checkbox.

Q2: Why am I seeing an IP mismatch error?

- The system is locked to your registered IP for security. If your IP has changed, you will be denied access. Contact support to update your IP.

Q3: The dashboard says 'OFFLINE' or 'No Data'. What does this mean?

- The robot may be powered off or disconnected.
- Check the robot client is running and connected to the internet.
- Refresh the dashboard or contact your administrator.

Q4: How do I send commands to the robot?

- Use the control buttons or keyboard shortcuts (WASD, etc.) in the dashboard.
- Ensure the robot is powered on and online.

Q5: Can I access the dashboard from a different device or network?

- No, access is restricted to your registered IP for security. Contact support if you need to update your access.

Q6: How do I download logs or export data?

- Use the 'Download Log' button in the dashboard to export recent telemetry and activity data as a JSON file.

Q7: What should I do if I see a security or session error?

- Log out and log in again.
- If the issue persists, clear your browser cache or contact support.

Q8: How do I update my password or passkey?

- Contact your administrator to request a password or passkey reset.

Support

For further assistance, contact your Engineering department or project lead.