# Worker Safety Monitoring Dashboard

This dashboard provides real-time monitoring of worker safety using Firebase as the backend.

## Firebase Setup

1. Create a Firebase project at [firebase.google.com](https://firebase.google.com)
2. Enable Firestore Database in your project
3. Set up the following collections in Firestore:
   * workers: For worker data
   * sensors: For sensor readings
   * devices: For wearable device data
   * alerts: For system alerts
4. Update the Firebase configuration in src/firebase/config.js with your project details:

```javascript const firebaseConfig = { apiKey: "YOUR\_API\_KEY", authDomain: "YOUR\_AUTH\_DOMAIN", projectId: "YOUR\_PROJECT\_ID", storageBucket: "YOUR\_STORAGE\_BUCKET", messagingSenderId: "YOUR\_MESSAGING\_SENDER\_ID", appId: "YOUR\_APP\_ID", measurementId: "YOUR\_MEASUREMENT\_ID" }; ```

## Data Structure

### Workers Collection

```javascript { "id": "worker1", "name": "John Smith", "position": "Maintenance Engineer", "status": "active", // active, warning, critical, offline "location": "Zone 1 - Main Floor", "heartRate": 72, "motionStatus": "moving", // moving, stationary, fallen "fallDetected": false, "lastUpdated": serverTimestamp() } ```

### Sensors Collection

```javascript { "id": "sensor1", "name": "Temperature Sensor", "value": 24.5, "unit": "°C", "status": "normal", // normal, warning, critical "location": "Zone 1 - Main Floor", "lastUpdated": serverTimestamp() } ```

### Devices Collection

```javascript { "id": "WD-001", "type": "Wearable", "assignedTo": "John Smith", "batteryLevel": 78, "firmwareVersion": "v2.1.4", "signalStrength": 85, "lastSync": serverTimestamp(), "status": "normal" // normal, warning, critical, offline } ```

### Alerts Collection

```javascript { "message": "Warning: Elevated heart rate detected for John Smith", "level": "warning", // info, warning, critical "worker": "John Smith", // optional, can be null "timestamp": serverTimestamp() } ```

## Sending Data to Firebase

You can use the utility functions in src/utils/dataUploader.js to send data to Firebase from your IoT devices or other systems.

Example: ```javascript import { updateSensorReading } from './utils/dataUploader';

// Update a temperature sensor reading updateSensorReading('temp-sensor-1', 28.5, 'warning'); ```

## Testing with Simulated Data

You can use the IoT simulator to generate test data:

```javascript import { runAllSimulations } from './utils/iotSimulator';

// Run all simulations once runAllSimulations();

// Or set up a periodic simulation setInterval(runAllSimulations, 30000); // Run every 30 seconds ```

## Running the Application

1. Install dependencies: ``` npm install ```
2. Start the development server: ``` npm start ```
3. Open <http://localhost:3000> to view the dashboard