

Smart Vehicle Control System API Reference

This document provides detailed information about all available API endpoints, including request/response formats and authentication requirements.

Table of Contents

- [Authentication](#)
- [User Management](#)
- [User Preferences](#)
- [Car Owner & Relative Management](#)
- [Location Management](#)
- [Vehicle Control](#)
- [Camera Management](#)
- [Hardware Authentication](#)
- [Driver Monitoring System \(DMS\)](#)

Authentication

All protected endpoints require a JWT token sent in the Authorization header:

```
Authorization: Bearer <your_jwt_token>
```

User Management

Register a new user

Endpoint: `POST /api/users/register`

Authentication: None

Request Body - Car Owner:

```
{
  "email": "owner@example.com",
  "name": "John Doe",
  "password": "password123",
  "type": "car_owner",
  "car_name": "My Tesla",
  "profile_img": "https://example.com/profile.jpg", // optional
  "car_img": "https://example.com/car.jpg" // optional
}
```

Request Body - Relative:

```
{
  "email": "relative@example.com",
  "name": "Jane Smith",
  "password": "password123",
  "type": "relative"
}
```

Response - Success (201 Created):

```
{
  "message": "User registered successfully",
  "user": {
    "id": 1,
    "email": "owner@example.com",
    "name": "John Doe",
    "type": "car_owner",
    "profile_img": "https://example.com/profile.jpg",
    "car_img": "https://example.com/car.jpg",
    "car_name": "My Tesla"
  },
  "token": "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9..."
}
```

Error Responses:

- **400 Bad Request:** Missing or invalid fields
- **409 Conflict:** Email already exists

Login

Endpoint: POST /api/users/login

Authentication: None

Request Body:

```
{
  "email": "user@example.com",
  "password": "password123"
}
```

Response - Success:

```
{
  "message": "Login successful",
}
```

```
"user": {
  "id": 1,
  "email": "user@example.com",
  "name": "John Doe",
  "type": "car_owner",
  "profile_img": "https://example.com/profile.jpg",
  "car_img": "https://example.com/car.jpg",
  "car_name": "My Tesla",
  "created_at": "2023-07-15T14:32:45.123Z",
  "dark_mode": 0
},
"token": "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9..."
}
```

Error Responses:

- **400 Bad Request:** Missing email or password
- **401 Unauthorized:** Invalid credentials

Get User Profile

Endpoint: GET /api/users/profile

Authentication: Required

Response - Success:

```
{
  "user": {
    "id": 1,
    "email": "user@example.com",
    "name": "John Doe",
    "type": "car_owner",
    "profile_img": "https://example.com/profile.jpg",
    "car_img": "https://example.com/car.jpg",
    "car_name": "My Tesla",
    "created_at": "2023-07-15T14:32:45.123Z",
    "dark_mode": 0
  }
}
```

Error Responses:

- **401 Unauthorized:** Missing or invalid token
- **404 Not Found:** User not found

Update User Profile

Endpoint: PUT /api/users/profile

Authentication: Required

Request Body:

```
{
  "name": "Updated Name", // optional
  "email": "newemail@example.com", // optional
  "car_name": "My New Tesla" // optional
}
```

Response - Success:

```
{
  "message": "Profile updated successfully",
  "user": {
    "id": 1,
    "name": "Updated Name",
    "email": "newemail@example.com",
    "car_name": "My New Tesla",
    "updated": true
  }
}
```

Error Responses:

- **400 Bad Request:** No fields provided or invalid email format
- **401 Unauthorized:** Missing or invalid token
- **404 Not Found:** User not found
- **409 Conflict:** Email already exists

User Preferences

Get User Preferences

Endpoint: GET /api/users/preferences

Authentication: Required

Response - Success:

```
{
  "preferences": {
    "user_id": 1,
    "dark_mode": true
  }
}
```

Update User Preferences

Endpoint: `PUT /api/users/preferences`

Authentication: Required

Request Body:

```
{
  "dark_mode": true
}
```

Response - Success:

```
{
  "message": "Preferences updated successfully",
  "preferences": {
    "user_id": 1,
    "dark_mode": true
  }
}
```

Error Responses:

- `400 Bad Request`: Missing or invalid dark_mode value

Toggle Dark Mode

Endpoint: `POST /api/users/preferences/toggle-dark-mode`

Authentication: Required

Response - Success:

```
{
  "message": "Dark mode toggled successfully",
  "preferences": {
    "user_id": 1,
    "dark_mode": false
  }
}
```

Car Owner & Relative Management

Get Car Owner's Relatives

Endpoint: GET /api/users/owner/relatives

Authentication: Required (car owner only)

Response - Success:

```
{
  "owner": {
    "id": 1,
    "email": "owner@example.com",
    "name": "John Doe",
    "type": "car_owner",
    "profile_img": "https://example.com/profile.jpg",
    "car_img": "https://example.com/car.jpg",
    "car_name": "My Tesla",
    "created_at": "2023-07-15T14:32:45.123Z",
    "dark_mode": 1,
    "relatives": [
      {
        "id": 2,
        "email": "relative1@example.com",
        "name": "Jane Smith"
      },
      {
        "id": 3,
        "email": "relative2@example.com",
        "name": "Bob Johnson"
      }
    ]
  }
}
```

Error Responses:

- 400 Bad Request: User is not a car owner
- 403 Forbidden: User doesn't have car owner privileges

Add Relative to Car Owner

Endpoint: POST /api/users/owner/relatives

Authentication: Required (car owner only)

Request Body:

```
{
  "relativeId": 2
}
```

Response - Success (201 Created):

```
{
  "message": "Relative added successfully",
  "relationship": {
    "id": 1,
    "owner_id": 1,
    "relative_id": 2
  }
}
```

Error Responses:

- **400 Bad Request:** Missing relative ID or user is not a car owner
- **409 Conflict:** Relationship already exists

Remove Relative from Car Owner

Endpoint: DELETE /api/users/owner/relatives/:relativeId

Authentication: Required (car owner only)

URL Parameters:

- **relativeId:** ID of the relative to remove

Response - Success:

```
{
  "message": "Relative removed successfully",
  "success": true
}
```

Error Responses:

- **404 Not Found:** Relationship does not exist

Get Car Owners for a Relative

Endpoint: GET /api/users/relative/owners

Authentication: Required

Response - Success:

```
{
  "owners": [
    {
```

```

    "id": 1,
    "email": "owner1@example.com",
    "name": "John Doe",
    "profile_img": "https://example.com/profile1.jpg",
    "car_img": "https://example.com/car1.jpg",
    "car_name": "Tesla Model S"
  },
  {
    "id": 4,
    "email": "owner2@example.com",
    "name": "Alice Brown",
    "profile_img": "https://example.com/profile2.jpg",
    "car_img": "https://example.com/car2.jpg",
    "car_name": "BMW i8"
  }
]
}

```

Location Management

Save a New Location

Endpoint: `POST /api/location`

Authentication: None (consider adding in production)

Request Body:

```

{
  "latitude": "37.7749",
  "longitude": "-122.4194",
  "status": "active"
}

```

Status Values:

- `active`: Vehicle is in use
- `idle`: Vehicle is stationary
- `emergency`: Vehicle has an emergency
- `maintenance`: Vehicle is in maintenance mode

Response - Success (201 Created):

```

{
  "message": "Location saved successfully",
  "location": {
    "id": 1,
    "latitude": "37.7749",

```



```
"longitude": "-122.4194",
"status": "active"
}
}
```

Error Responses:

- **400 Bad Request:** Missing required fields or invalid data

Get Latest Location

Endpoint: GET /api/location

Authentication: None (consider adding in production)

Response - Success:

```
{
  "location": {
    "id": 1,
    "latitude": "37.7749",
    "longitude": "-122.4194",
    "status": "active",
    "created_at": "2023-07-15T14:32:45.123Z"
  }
}
```

Error Responses:

- **404 Not Found:** No location data found

Get All Locations

Endpoint: GET /api/location/all

Authentication: None (consider adding in production)

Response - Success:

```
{
  "locations": [
    {
      "id": 2,
      "latitude": "37.7750",
      "longitude": "-122.4195",
      "status": "active",
      "created_at": "2023-07-15T14:35:45.123Z"
    },
    {
```

```
    "id": 1,
    "latitude": "37.7749",
    "longitude": "-122.4194",
    "status": "active",
    "created_at": "2023-07-15T14:32:45.123Z"
  }
]
```

Get Location by ID

Endpoint: GET /api/location/:id

Authentication: None (consider adding in production)

URL Parameters:

- **id:** Location ID

Response - Success:

```
{
  "location": {
    "id": 1,
    "latitude": "37.7749",
    "longitude": "-122.4194",
    "status": "active",
    "created_at": "2023-07-15T14:32:45.123Z"
  }
}
```

Error Responses:

- **404 Not Found:** Location with specified ID not found

Vehicle Control

Execute Car Control Action

Endpoint: POST /api/car-control

Authentication: None (consider adding in production)

Request Body:

```
{
  "action": "6"
}
```

Action Values:

- 5: Stop
- 6: Forward movement
- 7: Backward movement
- 8: Right turn
- 9: Left turn

Response - Success (201 Created):

```
{
  "message": "Car control action saved successfully",
  "control": {
    "id": 1,
    "action": "6"
  }
}
```

Error Responses:

- 400 Bad Request: Missing action or invalid action value

Get Latest Car Control Action

Endpoint: GET /api/car-control

Authentication: None (consider adding in production)

Response - Success:

```
{
  "control": {
    "id": 1,
    "action": "6",
    "created_at": "2023-07-15T14:32:45.123Z"
  }
}
```

Error Responses:

- 404 Not Found: No car control data found

Get All Car Control Actions

Endpoint: GET /api/car-control/all

Authentication: None (consider adding in production)

Response - Success:

```
{
  "controls": [
    {
      "id": 2,
      "action": "8",
      "created_at": "2023-07-15T14:35:45.123Z"
    },
    {
      "id": 1,
      "action": "6",
      "created_at": "2023-07-15T14:32:45.123Z"
    }
  ]
}
```

Get Car Control Action by ID

Endpoint: GET /api/car-control/:id

Authentication: None (consider adding in production)

URL Parameters:

- **id:** Control action ID

Response - Success:

```
{
  "control": {
    "id": 1,
    "action": "6",
    "created_at": "2023-07-15T14:32:45.123Z"
  }
}
```

Error Responses:

- **404 Not Found:** Car control action with specified ID not found

Camera Management

Change Camera State

Endpoint: POST /api/camera-control

Authentication: None (consider adding in production)

Request Body:

```
{
  "status": 11
}
```

Status Values:

- 11: First camera on
- 12: First camera off
- 13: Second camera on
- 14: Second camera off
- 15: Both cameras on
- 16: Both cameras off

Response - Success (201 Created):

```
{
  "message": "Camera control status saved successfully",
  "control": {
    "id": 1,
    "status": 11
  }
}
```

Error Responses:

- 400 Bad Request: Missing status or invalid status code

Get Latest Camera Control Status

Endpoint: GET /api/camera-control

Authentication: None (consider adding in production)

Response - Success:

```
{
  "control": {
    "id": 1,
    "status": "11",
    "created_at": "2023-07-15T14:32:45.123Z"
  }
}
```

Error Responses:

- **404 Not Found:** No camera control data found

Get All Camera Control Statuses

Endpoint: **GET** /api/camera-control/all

Authentication: None (consider adding in production)

Response - Success:

```
{
  "controls": [
    {
      "id": 2,
      "status": "15",
      "created_at": "2023-07-15T14:35:45.123Z"
    },
    {
      "id": 1,
      "status": "11",
      "created_at": "2023-07-15T14:32:45.123Z"
    }
  ]
}
```

Get Camera Control Status by ID

Endpoint: **GET** /api/camera-control/:id

Authentication: None (consider adding in production)

URL Parameters:

- **id:** Control status ID

Response - Success:

```
{
  "control": {
    "id": 1,
    "status": "11",
    "created_at": "2023-07-15T14:32:45.123Z"
  }
}
```

Error Responses:

- **404 Not Found:** Camera control status with specified ID not found

Hardware Authentication

Set Hardware Authentication Status

Endpoint: `POST /api/hw-auth`

Authentication: None (consider adding in production)

Request Body:

```
{
  "status": 1
}
```

Status Values:

- `1`: Authenticated (vehicle is authorized to operate)
- `0`: Not authenticated (vehicle is locked)

Response - Success (201 Created):

```
{
  "message": "Hardware authentication status saved successfully",
  "auth": {
    "id": 1,
    "status": 1
  }
}
```

Error Responses:

- `400 Bad Request`: Missing status or invalid status value

Get Latest Hardware Authentication Status

Endpoint: `GET /api/hw-auth`

Authentication: None (consider adding in production)

Response - Success:

```
{
  "auth": {
    "id": 1,
    "status": 1,
    "created_at": "2023-07-15T14:32:45.123Z"
  }
}
```

Error Responses:

- **404 Not Found:** No authentication data found

Get All Hardware Authentication Statuses

Endpoint: `GET /api/hw-auth/all`

Authentication: None (consider adding in production)

Response - Success:

```
{
  "auths": [
    {
      "id": 2,
      "status": 0,
      "created_at": "2023-07-15T14:35:45.123Z"
    },
    {
      "id": 1,
      "status": 1,
      "created_at": "2023-07-15T14:32:45.123Z"
    }
  ]
}
```

Get Hardware Authentication Status by ID

Endpoint: `GET /api/hw-auth/:id`

Authentication: None (consider adding in production)

URL Parameters:

- **id:** Authentication status ID

Response - Success:

```
{
  "auth": {
    "id": 1,
    "status": 1,
    "created_at": "2023-07-15T14:32:45.123Z"
  }
}
```


Error Responses:

- **404 Not Found:** Authentication status with specified ID not found

Driver Monitoring System (DMS)

Create DMS Status

Endpoint: **POST** /api/dms

Authentication: None (consider adding in production)

Request Body:

```
{
  "status": 1
}
```

Status Values:

- **1:** Issue detected
- **0:** No issue detected

Response - Success (201 Created):

```
{
  "message": "DMS status created successfully",
  "dms": {
    "id": 1,
    "status": 1,
    "created_at": "2023-07-15T14:32:45.123Z"
  }
}
```

Error Responses:

- **400 Bad Request:** Missing status or invalid status value

Get Latest DMS Status

Endpoint: **GET** /api/dms/latest

Authentication: None (consider adding in production)

Response - Success:

```
{
  "dms": {
```

```
    "id": 1,
    "status": 1,
    "created_at": "2023-07-15T14:32:45.123Z"
  }
}
```

Error Responses:

- **404 Not Found:** No DMS data found

Get DMS History

Endpoint: GET /api/dms/history

Authentication: Required

Query Parameters:

- **limit** (optional): Number of records to return (default: 20)
- **offset** (optional): Number of records to skip (default: 0)

Response - Success:

```
{
  "count": 2,
  "dmsEntries": [
    {
      "id": 2,
      "status": 0,
      "created_at": "2023-07-15T14:35:45.123Z"
    },
    {
      "id": 1,
      "status": 1,
      "created_at": "2023-07-15T14:32:45.123Z"
    }
  ]
}
```

Error Responses:

- **401 Unauthorized:** Missing or invalid token