# 1 EV CHARGING STATION BOOKING API — SWAGGER TEST REPORT

**How to authorize in Swagger**

1. Open /swagger → click **Authorize** (lock).

2. Paste the **raw JWT** from /api/Auth/login (no Bearer prefix).

3. Re-authorize anytime to switch roles (Admin / BackOffice / Operator / Owner).

**Role quick map**

- **Admin**: approve/reject BackOffice, reports, audits, stations, bookings.

- **BackOffice**: manage own stations & operators; approve bookings; view reports scoped to own stations.

- **Operator**: daily inbox, QR scan → check-in, finalize, exceptions.

- **Owner (EV user)**: register, login, create/manage bookings, request QR issue.

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**Admin**

**POST /api/Admin/admins**

**Purpose:** Create another admin. **Auth:** Admin
**Request**

```
{
 "fullName": "Second Admin",
 "email": "second.admin@example.com",
 "phone": "+94770000001",
 "password": "Admin2@123"
}
```
**Response (200)** – snippet

```
{ "nic": "ADM-002", "fullName": "Second Admin", "roles": ["Admin"], "isActive": true }
```

**GET /api/Admin/backoffices**

**Purpose:** List BackOffice applications. **Auth:** Admin
**Query:** status=Pending|Approved|Rejected, page=1, pageSize=20
**Response (200)** – snippet

```
{
 "items": [
```

```
  { "nic": "BO-7c9e2184d2f3", "fullName": "Blue Charge Pvt Ltd", "status": "Pending" }
 ],
 "page": 1, "pageSize": 20, "total": 1
}
```

## PUT /api/Admin/backoffices/{nic}/approve

**Purpose:** Approve a BackOffice application. **Auth:** Admin
**Path:** {nic} e.g., BO-7c9e2184d2f3
**Response (200)**

```
{ "nic": "BO-7c9e2184d2f3", "status": "Approved" }
```

## PUT /api/Admin/backoffices/{nic}/reject

**Purpose:** Reject a BackOffice application. **Auth:** Admin
**Path:** {nic}
**Response (200)**

```
{ "nic": "BO-7c9e2184d2f3", "status": "Rejected", "reason": "Incomplete documents" }
```

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**Audits**

## POST /api/Audits/search

**Purpose:** Search audit events. **Auth:** Admin/BackOffice (scoped)
**Request (by entity)**

```
{
 "entityType": "Booking",
 "entityId": "68dfd865b63b62232ae51d0e",
 "page": 1,
 "pageSize": 50
}
```
**Request (by action + range)**

```
{
 "action": "Approved",
 "fromUtc": "2025-01-01T00:00:00Z",
 "toUtc": "2030-01-01T00:00:00Z",
 "page": 1,
 "pageSize": 50
}
```
**Response (200)** – snippet

```
{
```

```
  "items": [
   {
    "action": "Approved",
    "entityType": "Booking",
    "entityId": "68dfd865b63b62232ae51d0e",
    "createdAtUtc": "2025-10-04T06:12:11Z",
    "payload": { "stationId": "68dfccbede4c66fbffb3a800" }
   }
  ]
}
```

---

## Auth

### POST /api/Auth/login

**Purpose:** Unified login — Owners by NIC; staff (Admin/BO/Operator) by email. **Auth:** Anonymous
**Owner login**

{ "username": "200012345678", "password": "Owner@123" }

### Staff login

{ "username": "owner@bluecharge.lk", "password": "BlueCharge@123" }

### Response (200) – snippet

```
{
 "accessToken": "eyJhbGciOiJIUzI1NiIsInR5cCI6...",
 "tokenType": "JWT",
 "expiresAtUtc": "2025-10-04T12:34:56Z",
 "nic": "200012345678",
 "fullName": "Nadeesha Fernando",
 "roles": ["Owner"]
}
```

---

## BackOffice

### POST /api/BackOffice/apply

**Purpose:** Public application to become BackOffice. **Auth:** Anonymous
**Request**

```
{
 "fullName": "Blue Charge Pvt Ltd",
 "email": "owner@bluecharge.lk",
```

```
  "phone": "+94771234567",
  "password": "BlueCharge@123",
  "businessName": "Blue Charge",
  "contactEmail": "contact@bluecharge.lk",
  "contactPhone": "+94112456789"
}
```

**Response (200)** – snippet

```
{ "nic": "BO-7c9e2184d2f3", "status": "Pending", "roles": ["BackOffice"] }
```

## GET /api/BackOffice/me

**Purpose:** Current BackOffice profile. **Auth:** BackOffice
**Response (200)** – snippet

```
{
  "nic": "BO-7c9e2184d2f3",
  "fullName": "Blue Charge Pvt Ltd",
  "status": "Approved",
  "stations": 2
}
```

## POST /api/BackOffice/operators

**Purpose:** Create Operator and (optionally) assign station(s). **Auth:** BackOffice
**Request**

```
{
  "fullName": "Kasun Perera",
  "email": "kasun.operator@bluecharge.lk",
  "phone": "+94775553311",
  "password": "Operator@123",
  "stationIds": ["68dfccbede4c66fbffb3a800"]
}
```

**Response (200)** – snippet

```
{ "nic": "OP-1b2c3d4e", "roles": ["Operator"], "operatorStationIds": ["68dfccb...a800"] }
```

## GET /api/BackOffice/operators

**Purpose:** List your operators. **Auth:** BackOffice
**Query:** page=1&pageSize=20
**Response (200)** – snippet

```
{ "items": [{ "nic": "OP-1b2c3d4e", "fullName": "Kasun Perera" }], "page":1, "pageSize":20, "total":1 }
```

## PUT /api/BackOffice/operators/{operatorNic}/stations

**Purpose:** Replace station assignments. **Auth:** BackOffice
**Path:** {operatorNic}
**Request**

{ "stationIds": ["68dfccbede4c66fbffb3a800", "68dc35a87b1226bef7869876"] }

**Response (200)**

{ "operatorNic": "OP-1b2c3d4e", "stationIds": ["68dfccb...a800","68dc35...9876"] }

**GET /api/BackOffice/debug/whoami**

**Purpose:** Inspect your claims for debugging. **Auth:** BackOffice
**Response (200)** – snippet

{ "nic": "BO-7c9e2184d2f3", "roles": ["BackOffice"], "email": "owner@bluecharge.lk" }

**GET /api/BackOffice/stations**

**Purpose:** List stations owned by this BackOffice. **Auth:** BackOffice
**Response (200)** – snippet

{ "items": [{ "id": "68dfccb...a800", "name": "Blue Charge – Union Place" }] }

---

**Booking**

**POST /api/Booking**

**Purpose:** Owner creates booking. **Auth:** Owner
**Request**

```
{
  "stationId": "68dfccbede4c66fbffb3a800",
  "localDate": "2025-12-10",
  "startTime": "10:00",
  "minutes": 60,
  "notes": "Nissan Leaf"
}
```
**Response (200)** – snippet

{ "id": "68dfd865b63b62232ae51d0e", "status": "Pending", "slotMinutes": 60 }

**GET /api/Booking**

**Purpose:** Staff list bookings (filters). **Auth:** Admin/BackOffice
**Query (examples):** stationId=...&status=Pending&page=1&pageSize=20
**Response (200)** – snippet

{ "items": [{ "id": "68dfd865b63b62232ae51d0e", "status": "Pending" }] }

**GET /api/Booking/mine**

**Purpose:** Owner's bookings. **Auth:** Owner
**Query:** status=&fromUtc=&toUtc=
**Response (200)** – snippet

{ "items": [{ "id": "68dfd865b63b62232ae51d0e", "status": "Pending" }] }

**GET /api/Booking/{id}**

**Purpose:** Get one booking. **Auth:** Owner (own) / Admin / BackOffice
**Response (200)** – snippet

{ "id": "68dfd865b63b62232ae51d0e", "stationId": "68dfccb...a800", "status": "Approved" }

**PUT /api/Booking/{id}**

**Purpose:** Reschedule/update (before cutoff). **Auth:** Owner
**Request**

{ "localDate": "2025-12-11", "startTime": "11:00", "minutes": 60, "notes": "Updated time" }

**Response (200)** – snippet

{ "id": "68dfd865b63b62232ae51d0e", "status": "Pending" }

**POST /api/Booking/{id}/cancel**

**Purpose:** Owner cancel before cutoff. **Auth:** Owner
**Response (200)**

{ "id": "68dfd865b63b62232ae51d0e", "status": "Cancelled" }

**PUT /api/Booking/{id}/approve**

**Purpose:** Approve booking, returns QR token. **Auth:** Admin/BackOffice
**Response (200)**

{
  "id": "68dfd865b63b62232ae51d0e",
  "status": "Approved",
  "qrToken": "booking:68dfd865b63b62232ae51d0e;ts:638948609616221770",
  "qrExpiresAtUtc": "2025-10-04T12:45:00Z"
}

**PUT /api/Booking/{id}/reject**

**Purpose:** Reject booking. **Auth:** Admin/BackOffice
**Response (200)**

{ "id": "68dfd865b63b62232ae51d0e", "status": "Rejected", "reason": "Invalid slot" }

---

**EvOwner**

**POST /api/EvOwner**

**Purpose:** Owner registration. **Auth:** Anonymous
**Request**

```
{
  "nic": "200012345678",
  "fullName": "Nadeesha Fernando",
  "email": "nadeesha.owner@example.com",
  "phone": "+94771230000",
  "password": "Owner@123",
  "addressLine1": "12 Flower Road",
  "addressLine2": "Colombo 7",
  "city": "Colombo"
}
```
**Response (200)** – snippet

{ "nic": "200012345678", "roles": ["Owner"], "isActive": true }

**GET /api/EvOwner/{nic}**

**Purpose:** Get owner profile. **Auth:** Admin/BackOffice/Owner(self)
**Response (200)** – snippet

{ "nic": "200012345678", "fullName": "Nadeesha Fernando" }

**PUT /api/EvOwner/{nic}**

**Purpose:** Update owner profile. **Auth:** Owner(self)/Admin/BackOffice
**Request**

{ "fullName": "Nadeesha F.", "phone": "0771230000", "city": "Colombo" }

**Response (200)** – snippet

{ "nic": "200012345678", "fullName": "Nadeesha F." }

**PUT /api/EvOwner/{nic}/deactivate**

**Purpose:** Deactivate owner. **Auth:** Admin
**Response (200)** – snippet

{ "nic": "200012345678", "isActive": false }

**PUT /api/EvOwner/{nic}/reactivate**

**Purpose:** Reactivate owner. **Auth:** Admin
**Response (200)** – snippet

{ "nic": "200012345678", "isActive": true }

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**Operator**

**GET /api/Operator/inbox**

**Purpose:** Today's Approved bookings for assigned stations. **Auth:** Operator
**Query:** date=YYYY-MM-DD (station's local date)
**Response (200)** – snippet

```
[
 {
  "id": "68dfd865b63b62232ae51d0e",
  "bookingCode": "BK-BE32",
  "stationId": "68dfccbede4c66fbffb3a800",
  "slotStartUtc": "2025-10-04T12:30:00Z",
  "slotMinutes": 60,
  "status": "Approved",
  "ownerNicMasked": "************5678",
  "slotStartLocal": "2025-10-04T18:00"
 }
]
```

**POST /api/Operator/scan**

**Purpose:** Scan QR → check-in. **Auth:** Operator
**Request**

```
{
 "qrToken": "PASTE_RAW_QR_TOKEN_HERE",
 "bookingId": "68dfd865b63b62232ae51d0e"
}
```

**Response (200)** – snippet

{ "id": "68dfd865b63b62232ae51d0e", "status": "CheckedIn" }

**POST /api/Operator/exception**

**Purpose:** Mark exceptions. **Auth:** Operator
**Request (choose one reason)**

{ "bookingId": "68dfd865b63b62232ae51d0e", "reason": "NoShow", "notes": "Customer never arrived" }

Allowed: "NoShow" (post-slot+grace), "Aborted" (from CheckedIn), "CustomerCancelOnSite".

**Response (200)** – snippet

{ "id": "68dfd865b63b62232ae51d0e", "status": "NoShow" }

---

**Qr**

**POST /api/Qr/verify**

**Purpose:** Validate raw QR token before check-in. **Auth:** Operator/BackOffice/Admin
**Request**

{ "qrToken": "PASTE_RAW_QR_TOKEN_HERE" }

**Response (200)** – snippet

```
{
 "valid": true,
 "bookingId": "68dfd865b63b62232ae51d0e",
 "stationId": "68dfccbede4c66fbffb3a800",
 "slotStartUtc": "2025-10-04T12:30:00Z",
 "expiresAtUtc": "2025-10-04T12:45:00Z",
 "status": "Approved"
}
```
**POST /api/Qr/issue/{bookingId}**

**Purpose:** Issue/re-issue QR for an Approved booking. **Auth:** Owner/BackOffice/Admin
**Path:** {bookingId}
**Response (200)**

```
{
 "id": "68dfd865b63b62232ae51d0e",
 "status": "Approved",
 "qrToken": "booking:68dfd865b63b62232ae51d0e;ts:638948609616221770",
 "qrExpiresAtUtc": "2025-10-04T12:45:00Z"
}
```

---

**Reports**

**GET /api/Reports/summary**

**Purpose:** KPIs rollup. **Auth:** Admin/BackOffice
**Query:** fromUtc(opt), toUtc(opt), stationId(opt)
**Response (200)**

```
{
 "bookingsCreated": 12,
 "approved": 10,
 "rejected": 1,
 "cancelled": 1,
 "checkedIn": 9,
 "completed": 9,
 "approvalRate": 0.83,
 "checkInRate": 0.9,
 "completionRate": 1.0,
 "revenueTotal": 6250.0,
 "energyTotalKwh": 214.5
}
```

### GET /api/Reports/time-series/bookings

**Purpose:** Booking metrics over time. **Auth:** Admin/BackOffice
**Query:** metric=created|approved|rejected|cancelled|checkedin|completed, fromUtc, toUtc, granularity=day|week|month, stationId(opt)
**Response (200)**

```
{ "metric": "approved", "granularity": "day", "points": [ { "bucketStartUtc": "2025-10-04T00:00:00Z", "value": 2 } ] }
```

### GET /api/Reports/time-series/revenue

**Purpose:** Revenue over time. **Auth:** Admin/BackOffice
**Query:** fromUtc, toUtc, granularity=day|week|month, stationId(opt)
**Response (200)**

```
{ "metric": "revenue", "granularity": "day", "points": [ { "bucketStartUtc": "2025-10-04T00:00:00Z", "value": 625.0 } ] }
```

### GET /api/Reports/stations/{stationId}/utilization

**Purpose:** Daily reserved vs capacity%. **Auth:** Admin/BackOffice
**Path:** {stationId}; **Query:** fromLocalDate=YYYY-MM-DD&toLocalDate=YYYY-MM-DD
**Response (200)**

```
{ "stationId": "68dfccbede4c66fbffb3a800", "daily": [ { "date": "2025-10-04", "reserved": 6, "capacity": 16, "utilizationPct": 0.375 } ] }
```

### GET /api/Reports/revenue/by-station

**Purpose:** Revenue grouped by station. **Auth:** Admin/BackOffice
**Query:** fromUtc, toUtc
**Response (200)**

{ "items": [ { "stationId": "68dfccb...a800", "stationName": "Union Place", "revenue": 3125.0 } ] }

### GET /api/Reports/stations/{stationId}/occupancy-heatmap

**Purpose:** Heatmap (day-of-week × hour). **Auth:** Admin/BackOffice
**Path:** {stationId}; **Query:** fromUtc, toUtc
**Response (200)**

```
{
  "stationId": "68dfccbede4c66fbffb3a800",
  "cells": [ { "dow": 6, "hour": 16, "avgReservedPct": 0.5 } ]
}
```

---

## Sessions

### POST /api/Sessions/checkin

**Purpose:** Start session (QR required). **Auth:** Operator/BackOffice/Admin
**Request**

```
{
  "bookingId": "68dfd865b63b62232ae51d0e",
  "qrToken": "PASTE_SAME_QR_TOKEN_HERE"
}
```
**Response (200)**

{ "id": "68dfd865b63b62232ae51d0e", "status": "CheckedIn" }

### POST /api/Sessions/finalize

**Purpose:** End session; compute totals. **Auth:** Operator/BackOffice/Admin
**Request**

```
{
  "bookingId": "68dfd865b63b62232ae51d0e",
  "energyKwh": 21.4,
  "unitPrice": 110.0,
  "notes": "Night tariff"
}
```
**Response (200)** – snippet

```
{
  "bookingId": "68dfd865b63b62232ae51d0e",
```

```
  "completedAtUtc": "2025-10-04T13:35:00Z",
  "energyKwh": 21.4,
  "unitPrice": 110.0,
  "total": 2354.0
}
```

---

**Station**

**POST /api/Station**

**Purpose:** Create station (owned by calling BackOffice). **Auth:** BackOffice/Admin
**Request**

```
{
  "name": "Blue Charge – Union Place",
  "type": "AC",
  "connectors": 2,
  "autoApproveEnabled": false,
  "lat": 6.9187,
  "lng": 79.8573,
  "defaultSlotMinutes": 60,
  "hoursTimezone": "Asia/Colombo",
  "pricing": { "model": "flat", "base": 250.0, "perHour": 0, "perKwh": 0, "taxPct": 8.0 }
}
```
**Response (200)** – snippet

```
{ "id": "68dfccbede4c66fbffb3a800", "name": "Blue Charge – Union Place", "status": "Active" }
```

**GET /api/Station**

**Purpose:** Public station list (filters supported). **Auth:** Anonymous
**Query (examples):** type=AC&status=Active&minConnectors=1&page=1&pageSize=20
**Response (200)** – snippet

```
{ "items": [{ "id": "68dfccb...a800", "name": "Blue Charge – Union Place" }] }
```

**GET /api/Station/{id}**

**Purpose:** Station details. **Auth:** Anonymous
**Response (200)** – snippet

```
{ "id": "68dfccbede4c66fbffb3a800", "name": "Blue Charge – Union Place", "connectors": 2 }
```

**PUT /api/Station/{id}**

**Purpose:** Update station. **Auth:** BackOffice(Admin for any)
**Request**

```
{ "name": "Blue Charge – Union Place (Updated)", "autoApproveEnabled": true }
```

**Response (200)** – snippet

```
{ "id": "68dfccb...a800", "autoApproveEnabled": true }
```

**PUT /api/Station/{id}/deactivate**

**Purpose:** Deactivate station. **Auth:** BackOffice/Admin
**Response (200)**

```
{ "id": "68dfccb...a800", "status": "Inactive" }
```

**PUT /api/Station/{id}/activate**

**Purpose:** Activate station. **Auth:** BackOffice/Admin
**Response (200)**

```
{ "id": "68dfccb...a800", "status": "Active" }
```

**GET /api/Station/nearby**

**Purpose:** Public nearby search w/ availability summary. **Auth:** Anonymous
**Query:** lat=6.9167&lng=79.8560&radiusKm=5&type=AC
**Response (200)** – snippet

```
[
 {
  "id": "68dfccb...a800",
  "name": "Blue Charge – Union Place",
  "distanceKm": 1.2,
  "availabilitySummary": [
   { "date": "2025-10-04", "availableSlots": 6 }
  ]
 }
]
```

**GET /api/Station/{id}/schedule**

**Purpose:** Public schedule. **Auth:** Anonymous
**Response (200)**

```
{
 "weekly": {
  "mon": [{ "start": "08:00", "end": "20:00" }],
  "tue": [{ "start": "08:00", "end": "20:00" }],
  "sun": []
 },
 "exceptions": [{ "date": "2025-12-25", "closed": true }],
```

```
  "capacityOverrides": [{ "date": "2025-12-10", "connectors": 1 }]
}
```

## PUT /api/Station/{id}/schedule

**Purpose:** Upsert station schedule. **Auth:** BackOffice/Admin
**Request**

```
{
 "weekly": {
  "mon": [{ "start": "08:00", "end": "20:00" }],
  "tue": [{ "start": "08:00", "end": "20:00" }],
  "wed": [{ "start": "08:00", "end": "20:00" }],
  "thu": [{ "start": "08:00", "end": "20:00" }],
  "fri": [{ "start": "08:00", "end": "20:00" }],
  "sat": [{ "start": "09:00", "end": "18:00" }],
  "sun": []
 },
 "exceptions": [{ "date": "2025-12-25", "closed": true }],
 "capacityOverrides": [{ "date": "2025-12-10", "connectors": 1 }]
}
```
**Response (200)**

```
{ "stationId": "68dfccb...a800", "saved": true }
```

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**Happy-path smoke test (copy/paste order)**

1. **Owner**: /api/EvOwner (register) → /api/Auth/login.

2. **BackOffice**: /api/BackOffice/apply → **Admin** approves
   /api/Admin/backoffices/{nic}/approve → **BackOffice** login.

3. **BackOffice**: /api/Station → /api/Station/{id}/schedule (PUT) → /api/BackOffice/operators
   (create operator).

4. **Owner**: /api/Booking (create).

5. **BackOffice**: /api/Booking/{id}/approve (get qrToken).

6. **Operator**: /api/Operator/scan (or /api/Qr/verify → /api/Sessions/checkin) →
   /api/Sessions/finalize.

7. **Admin/BO**: /api/Audits/search, /api/Reports/*.

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**Common testing tips**

- **Time windows**: Check-in allowed from slotStartUtc – 15m to slotStartUtc + slotMinutes + 15m.

- **QR**: Use the **raw** token from approve/issue; expiry enforced.

- **Operator scope**: Operator must be assigned to the station to scan/check-in.

- **Owner cancel/update**: Enforced by cutoff rules; expect conflict if too late.