iTHEIA Data File Pull REST API Specification

Version 1.0

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Introduction

Quarterhill Inc., a leading provider of tolling and enforcement solutions in the Intelligent Transportation System (ITS) industry, has vested the operational responsibilities of its safety and enforcement division to its subsidiary, International Road Dynamics Inc. (IRD). Quarterhill's safety and enforcement division is legally operated by IRD. This legal designation ensures that the safety and enforcement division's activities are executed in accordance with prescribed legal and regulatory frameworks within Quarterhill's organizational structure.

The iTHEIA system includes an Application Programming Interface (API) for remote, automated data retrieval. The iTHEIA Data File Pull REST API provides client systems with the ability to list files, download, and generate data files on demand. It adheres to the OpenAPI Specification (OAS) 3.1 and requires secure authentication through an API key

This document provides a comprehensive specification for the iTHEIA Data File Pull REST API.

API Overview and Authentication

The iTHEIA Data File Pull REST API enables:

- Listing of available data files
- Download of specific data files
- On-demand data file generation

The API supports JSON-based request and response structures and uses standard HTTP methods.

All API requests must include a valid API key in the “itheia-api-key” header. Unauthorized or expired keys will result in access denial.

Interface Specifications

Base URL

`https://<domain_or_ip>/data-api/`

`<domain_or_ip>` can be:

- `“itheia.quarterhill.local”` when connecting to the physical network port
- Modem IP or modem domain name when connecting remotely

Endpoints and Parameters

GET /v1/data-files (List all available data files)

Parameters:

- `itheia-api-key` (header) – Required
  - API key for authentication.
- `since` (query) – Optional
  - Start date for filtering results (Format: YYYY-MM-DD).

Response Codes:

- `200 OK` – Successfully retrieved list of all available data files.
- `400 Bad Request` – Invalid date format.
- `401 Unauthorized` – Missing or invalid API key.
- `403 Forbidden` – Expired API key.
- `429 Too Many Requests` – Rate limit exceeded.
- `500 Internal Server Error` – Unexpected server issue.

Response Payload: *JSON array of available files. Refer to List Available Data Files section in Appendix for sample JSON payload.*

GET /v1/data-files/{name} (Download specific data file)

Parameters:

- `name` (path) – Required
  - File name to download.
- `itheia-api-key` (header) – Required
  - API key for authentication.

Response Codes:

- `200 OK` – Successfully downloaded specified data file.
- `400 Bad Request` – Missing API key.
- `401 Unauthorized` – Missing or invalid API key.
- `403 Forbidden` – Expired API key.
- `429 Too Many Requests` – Request limit exceeded.
- `500 Internal Server Error` – Unexpected server issue.

Response Payload: *File binary stream*

GET /v1/on-demand-data-files (Generate and download data file on demand)

Parameters:

- `itheia-api-key` (header) – Required
  - API key for authentication.
- `from` (query) – Required
  - Start date in milliseconds since Unix epoch. Must be within the last number of days defined by "Data Retention (days)" in the "System" tab of the "Configuration" page in the iTHEIA main web user interface.
  - For example, if the "Data Retention (days)" is set to 30 days, the start date must be on or after 12:00 AM (beginning of day) 30 days ago in site time zone.
- `to` (query) – Required
  - End date in milliseconds since Unix epoch. Must be less than 24 hours after the “from" parameter.
- `format` (query) – Optional
  - File format (`PerVehicle` or `MS2`), defaults to `PerVehicle`.

Response Codes:

- `200 OK` – Successfully generated and downloaded data file using specified parameters.
- `400 Bad Request` – Invalid parameter values.
- `401 Unauthorized` – Missing or invalid API key.
- `403 Forbidden` – Expired API key.
- `429 Too Many Requests` – Rate limit exceeded.
- `500 Internal Server Error` – Unexpected server issue.

Response Payload: *Binary stream of the generated data file in .zip format*

Security & Compliance

API Key Management

- API keys are unique to each user account and must be included in every request.
- Expired or invalid keys result in a `403 Forbidden` response.

Rate Limiting & Throttling

The API enforces request limits to prevent abuse (`429 Too Many Requests`).

- API server allows a maximum of 60 requests to any API endpoints originating from the same IP address per minute

Data Protection Considerations

- All API communications should be encrypted using HTTPS.

- Sensitive data should never be exposed in query parameters.

Appendix

Examples

List Available Data Files

Request:

```
GET /v1/data-files?since=2025-02-18 HTTP/1.1
Host: itheia.quarterhill.local
Authorization: itheia-api-key 4281c491-befe-4afb-b60e-1291aaafebd8
```

Response: *(Example JSON)*

```
[
  {
    "fileName": "PerVehicle_ABC123_20250218.itheia.csv",
    "dataDate": "2025-02-18",
    "format": "PerVehicle"
  },
  {
    "fileName": "MS2_ABC123_20250218.xml",
    "dataDate": "2025-02-18",
    "format": "MS2"
  }
]
```

Downloading a Data File

Request:

```
GET /v1/data-files/PerVehicle_ABC123_20250218.itheia.csv HTTP/1.1
Host: itheia.quarterhill.local
Authorization: itheia-api-key 4281c491-befe-4afb-b60e-1291aaafebd8
```

Generating Data on Demand

Request:

```
GET /v1/on-demand-data-
files?from=1697133004937&to=1697133081051&format=PerVehicle HTTP/1.1
Host: itheia.quarterhill.local
Authorization: itheia-api-key 4281c491-befe-4afb-b60e-1291aaafebd8
```