Tips for IDB API Clients

Table of Contents

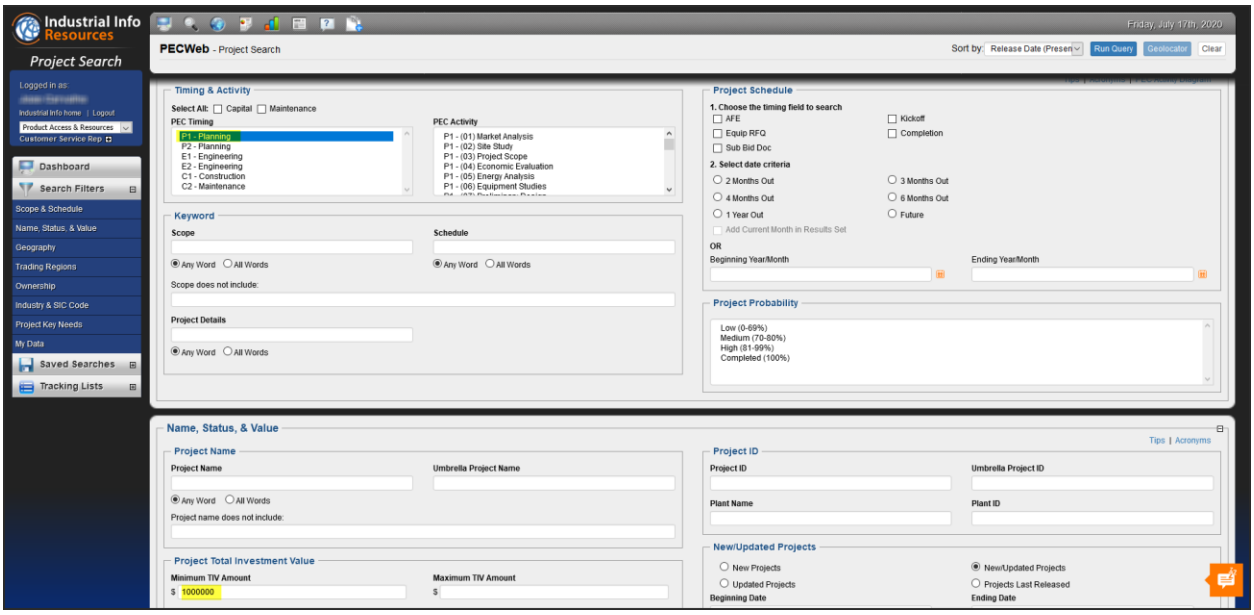
1. What is IDB API?

The easiest way to understand IIR IDB (Industrial Database) API is to think it as an alternative way to retrieve the PECWEB data, via the backend. Both PECWEB and IDB API follow a similar paradigm. See the Project Search example below:

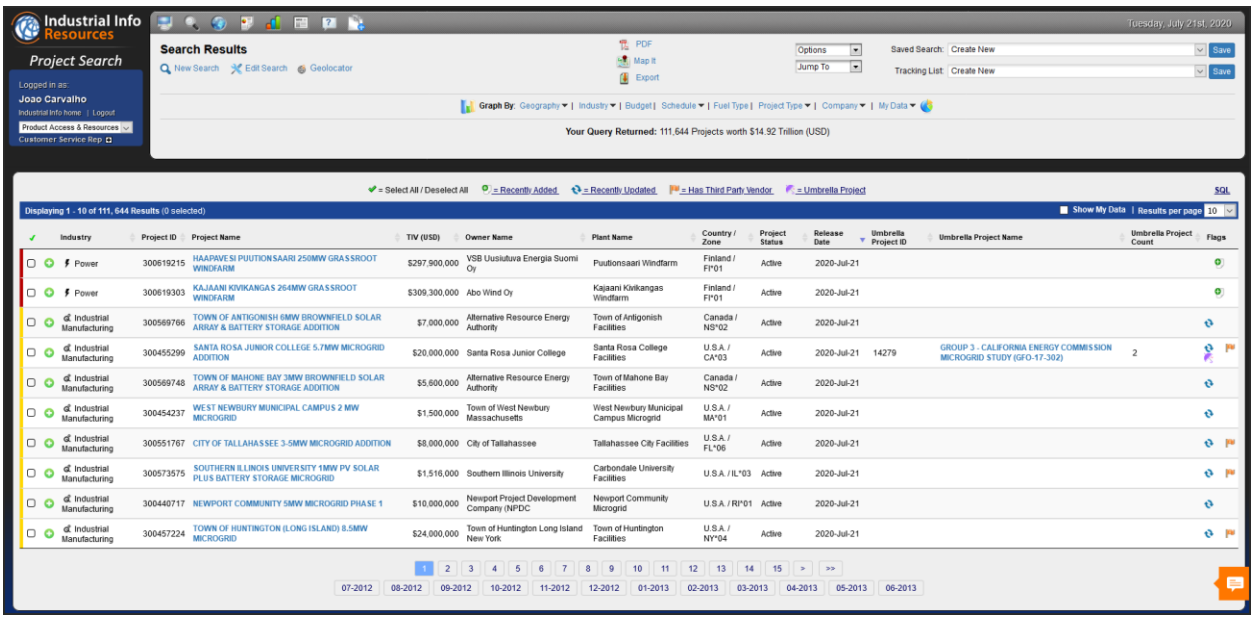
Product Search -> Parameter Combo -> Result (Summary or Detail) -> Paging/Looping

1.1 PECWEB:

1.1.1 Project Search -> “PEC Timing = P1” + “Minimum TIV Amount = $10,000,000”:



1.1.2 Project Search Results > Summary Records –> Paging Through Multiple Pages



Summary Report:

report		
PROJECT INDEX		
Industry/Date/Project ID/Umbrella Project ID	**Project Name/Owner Name/Plant Name/Umbrella Project Name**	**TIV(USD)/Country/Zone/Status/Umbrella Project Count**
Metals & Minerals	BOULONNAIS LIMESTONE QUARRY EXPANSION	$6,000,000
17-Jul-2020	Les Granulats du Groupe CB	France / FR*01
300619128	Ferques Boulonnais Limestone Quarry	Active

Detail Report:

Capital PEC Report — **Project ID: 300619128**

PEC Activity Diagram

Project Name BOULONNAIS LIMESTONE QUARRY EXPANSION
Industry Code 08 Metals & Minerals — **Project Type** Plant Expansion
TIV (USD) 6,000,000
SIC Code 1422 Crushed & Broken Limestone — **Sector** Mining
SIC Product 1422*0008 Limestone, except bituminous: crushed and broken-quarrying
Status Active — **Last Update** 17-Jul-2020 — **Initial Release** 17-Jul-2020
Environmental Air (A) Land (L) Water (W) — **Construction Labor Preference** Unconfirmed
Operations Labor Preference Unconfirmed

Plant Owner Les Granulats du Groupe CB — **Plant Parent** Les Granulats du Groupe CB
Plant Name Ferques Boulonnais Limestone Quarry — **Unit Name**
Plant ID 3207542
Location Rue Louis Le SenechalCarrieres du Boulonnais — **Phone** +33 321 996 700
City/State Ferques, Nord-Pas-de-Calais 62250 France — **Zone/County** FR*01, Pas-de-Calais

Project Responsibility	Project Company	Project Contact
Project Manager	Les Granulats du Groupe CB Rue Louis Le Senechal Ferques, Nord-Pas-de-Calais 0000 France	Heubert Quenu Project Manager [Tel.] +33 321 996 700 [E-Mail] hquenu@groupecb.com
Project Director	Les Granulats du Groupe CB Rue Louis Le Senechal, Carrieres du Boulonnais Ferques, Nord-Pas-de-Calais 62250 France	Thierry Decool Site Head [Tel.] +33 321 996 700 [E-Mail] tdecool@groupecb.com; [LinkedIn] thierry-decool-5077a575
Inspection/Validation/Startup	Les Granulats du Groupe CB Rue Louis Le Senechal, Carrieres du Boulonnais Ferques, Nord-Pas-de-Calais 62250 France	Miguel Bernard Technical Head [Tel.] +33 321 996 700 [E-Mail] mbernard@groupecb.com (!); [LinkedIn] miguel-bernard-873086105

PEC® Timing P1 — **PEC® Activity** Project Scope
Project Probability Low (0-69%)
Scope Les Granulats du Groupe CB continues with Project Scope for Boulonnais Limestone Quarry Expansion. DETAILS: Expand Existing 7MT/yr Limestone Quarry to Keep Production at Current Capacity and Prolong Lifetime of Quarry. REQUIRES: Conveyor Belts, Excavators, Grinders, Limestone Stockpiles/Storage, Mining Equipment, Power Shovel, Haul Trucks, Limestone Crusher, Hoppers, Screens, Washers, Loaders, Motors, Drives, MCC, Controls (PLC). ENVIRONMENTAL: (A) Dust Collection/Suppression System; (L) Spill Containment; (W) Wastewater Treatment. *Expanded capacity yet to be decided
Schedule Les Granulats du Groupe CB continues with Project Scope 3Q20 (Jul). AFE Approvals by 2Q21 (May). Upon Approvals, Les Granulats du Groupe CB seeks and selects Contractor 3Q21 (Jul). Selected Contractor, releasing Bid Documents for selection of specialized Subcontractors and Procurement of Machinery and Equipment 3Q21 (Sep) - 4Q21 as required. Expansion Kick-Off Expected 4Q21 (Oct). Completion/Final Commissioning Scheduled 3Q22 (Sep).

Project Milestones: Eng 202107 — **AFE** 202105 — **Sub Bid Doc** 202109 — **Completion** 14-Sep-2022 — **Precision** QUARTER
Equip RFQ 202109 — **Kick-Off** 202110 — **Kickoff Slippage** 0 Months — **Construction Duration** 12 Months

Engineering	Civil	Electrical	Environmental	HVAC	Instrumentation	Mechanical	Structural
Contracting	Civil	Electrical	Environmental	HVAC	Instrumentation	Mechanical	Structural
Project Key Needs	Civil/Site	Structural		Control Room	Process Equip		
	Instrumentation	Electrical	Mechanical		Storage		
			Environmental	Utilities	Valves	Pumps	
	Communications			Continuous Process	Packaging	Transportation	

Matter Phase Solid
Energy
Buy
Sell

Plant Standard Contacts

Functional/Actual Title	Contact Name/E-mail	Telephone/On-site	QC Date/LinkedIn ID
Plant Manager	Thierry Decool	+33 321 996 700	Jul-2020
Site Head	tdecool@groupecb.com	Yes	thierry-decool-5077a575
Maintenance Manager	Miguel Bernard	+33 321 996 700	Jul-2020
Technical Head	mbernard@groupecb.com (!)	Yes	miguel-bernard-873086105
Engineering Manager	Miguel Bernard	+33 321 996 700	Jul-2020
Technical Head	mbernard@groupecb.com (!)	Yes	miguel-bernard-873086105
Human Resource Manager	Carole Doyelle	+33 321 996 700 Yes	Jul-2020 doyelle-carole-3561ab9
Mine Manager	Thierry Decool	+33 321 996 700	Jul-2020
Site Head	tdecool@groupecb.com	Yes	thierry-decool-5077a575

1.2 IDB API:

1.2.1 IDB API -> Project Search -> “PEC Timing = P1” + “Minimum TIV Amount = $10,000,000”:

API Http Request Search Parameters example (with JWT token):

curl -X POST
"**https://api.industrialinfo.com/idb/v1.1/projects/summary?tivMin=1000000&pecTiming=P1**" \
-H "Accept: application/json" \
-H "Authorization: Bearer
xxxxxxxxxxxxxxxxxxxxxxxxxxxxJzdWIiOiJndHNhaSIsImF1ZCI6IklJUl9BUEkiLCJpc3MiOiJJbmR1c3JpYWwgSW5m
byBSZXNvdXJjZXMiLCJpYXQiOjE1ODI4MzYyNjYsImV4cCI6MTU4NTQyODI2Nn0.N1HNdmTuaL8G7wSJkna
U7y9GuALqm42yDdQbkM8SpTU"

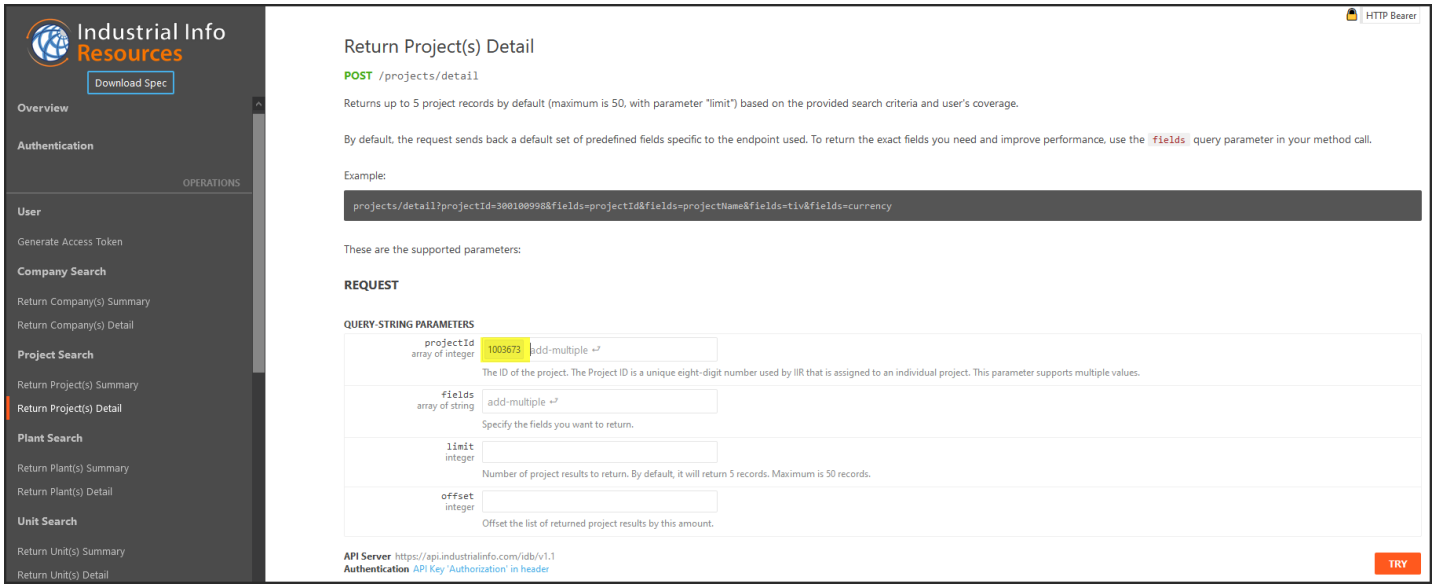
Results:

List of Summary Records: Looping Through


```
{
  "limit": 100,
  "offset": 0,
  "resultCount": 100,
  "totalCount": 111644,
  "projects": [
    {
      "projectId": 1003673,
      "projectName": "CORPUS CHRISTI BROWNFIELD 625-740MW NATURAL GAS LON C HILL COMBINED CYCLE",
      "industryCode": "01",
      "industryCodeDesc": "Power",
      "pecZone": "TX*05",
      "tiv": 800000000,
      "releaseDate": "2019-01-29T22:39:21Z[UTC]",
      "projectStatusDesc": "Cancelled",
      "projectOwnerName": "Consolidated Asset Management Services - CAMS",
      "plantId": 3128504,
      "plantName": "Lon C Hill Power Station",
      "plantPhysicalAddress": {
        "city": "Corpus Christi",
        "stateName": "Texas",
        "countryName": "U.S.A."
      }
    },
    {
```

Project Summary Result: (projectId = 1003673)

Project Detail Search: (projectId = 1003673)



Project Detail Result:

2. Security - JWT Token & OAuth 2

JSON Web Token (JWT, RFC 7519) is a way to encode claims in a JSON document that is then signed.

JWTs can be used as OAuth 2.0 Bearer Tokens to encode all relevant parts of an access token into the access token itself instead of having to store them in a database.

JWT

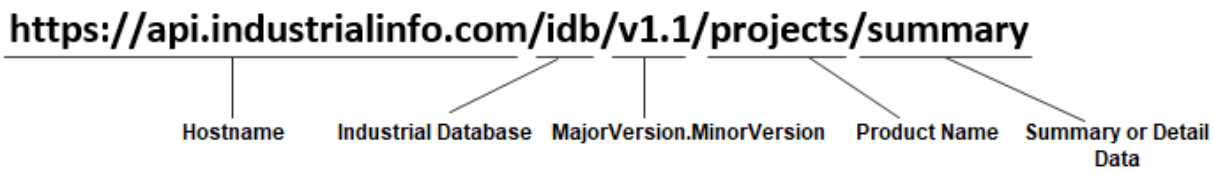
https://jwt.io/

JWT & OAuth2

https://oauth.net/2/jwt/

3. IDB API Endpoints

3.1 API Endpoint Structure



3.2 API Versioning

IDB API uses semantic versioning (major.minor.patch). All IDB API versions are displayed in descending order, with the latest version on top.

Also, you can be automatically upgraded to the latest minor version by only specifying the major version in the URL.

It's IIR's recommendation that you only specify major version in the URL as it will require less maintenance. We also recommend that you keep updating to the latest version as it provides the best up-to-date functionalities.

All the available versions and version change histories are listed in:

https://api.industrialinfo.com/idb/index.html

More information regarding IDB API Version Support Policy can be found below:

https://api.industrialinfo.com/idb/IDBAPI_Version_Policy.pdf

4. Summary/Detail/Count/Limit/Offset

The main differences between Summary vs Detail endpoints:

Summary	Detail
Supports all parameters	Supports only entity ID, fields, limit and offset parameters
Returns a default set of predefined fields.	Allows specifying the exact fields you need in the response.
Quicker performance	Acceptable performance
Returns up to 100 project records by default (maximum is 1000, with parameter "limit")	Returns up to 5 project records by default (maximum is 50, with parameter "limit")
Returns summary data view.	Returns detail data view
Best used for summary data	Best used for detailed data

Looping through data:

Field	Type	Description
limit*	integer	Limit number of project results to return. By default, it will return 5 records.
offset*	integer	Offset the list of returned project results by this amount.
resultCount*	integer	Number of project results returned. By default, it's limited to 100 records.
totalCount*	integer	Total number of projects IIR finds based on the search criteria. If the value exceeds 100, use multiple queries and combinations of the "limit" and "offset" parameters to refine search.

API Endpoints	Default	Max Limit
Summary API	100	1000
Detail API	5	50
References API	500	1000

Examples:

(1) Offset defaults to 0, if no offset is entered in the search parameter. Offset = 0 means that it will display the first record (offset/record number: 0) to the 100th record (offset/record number: 99), as record size (limit) is default to 100.

(2) To get to the next 100 records (record number 101 -200), you should use offset=100. (limit=100 is implied).

(3) To get the other next 100 records (record 201 -300), you should use offset=200, etc.

5. Reference Code List:

Commonly used reference codes are provided via the Reference API endpoints. You can use “&listAll=1” to retrieve all the listed values.

- Control Areas (76 Total)
- PEC Zones (498 Total)
- HS Products (8252 Total)
- Unit Types (270 Total)
- SIC Codes (582 Total)
- SIC Products (13823 Total)
- Equipment Types (21 Total)

6. Client Program Supports:

6.1 IDB API via Power BI:

Below is the instruction on how to create JWT token and call an IDB Offline Event API example within Power BI.

https://api.industrialinfo.com/idb/IDBAPI_PowerBI.pdf

6.2 IDB API via Power Query (Excel):

Below is a sample Excel file with Power Query code calling an IDB Offline Event API example:

https://api.industrialinfo.com/idb/IDBAPI_ExcelPowerQuery.xlsx

Note: POST requests can be performed in PowerQuery by adding content to the request. Said content can be something as simple as an empty string converted to binary format. For example, the following PowerQuery M Function will send a POST request to the IDB API (Note: this is a simplified version of the query used in the ExcelPowerQuery.xlsx spreadsheet mentioned above):

```
= Json.Document(Web.Contents(
"https://api.industrialinfo.com/idb/v1.1/offlineevents/summary?eventKind=O&eventStatusDesc=Ongoing&eventStatusDesc=Future&worldRegionId=1&worldRegionId=4&industryCode=01",
[Content=Text.ToBinary(""), Headers=[Authorization="Bearer " &
Table.FirstValue(Excel.CurrentWorkbook(){[Name="IIRAuthToken"]}[Content])]]
 ))
```

6.3 Using OpenAPI client program auto-generators:

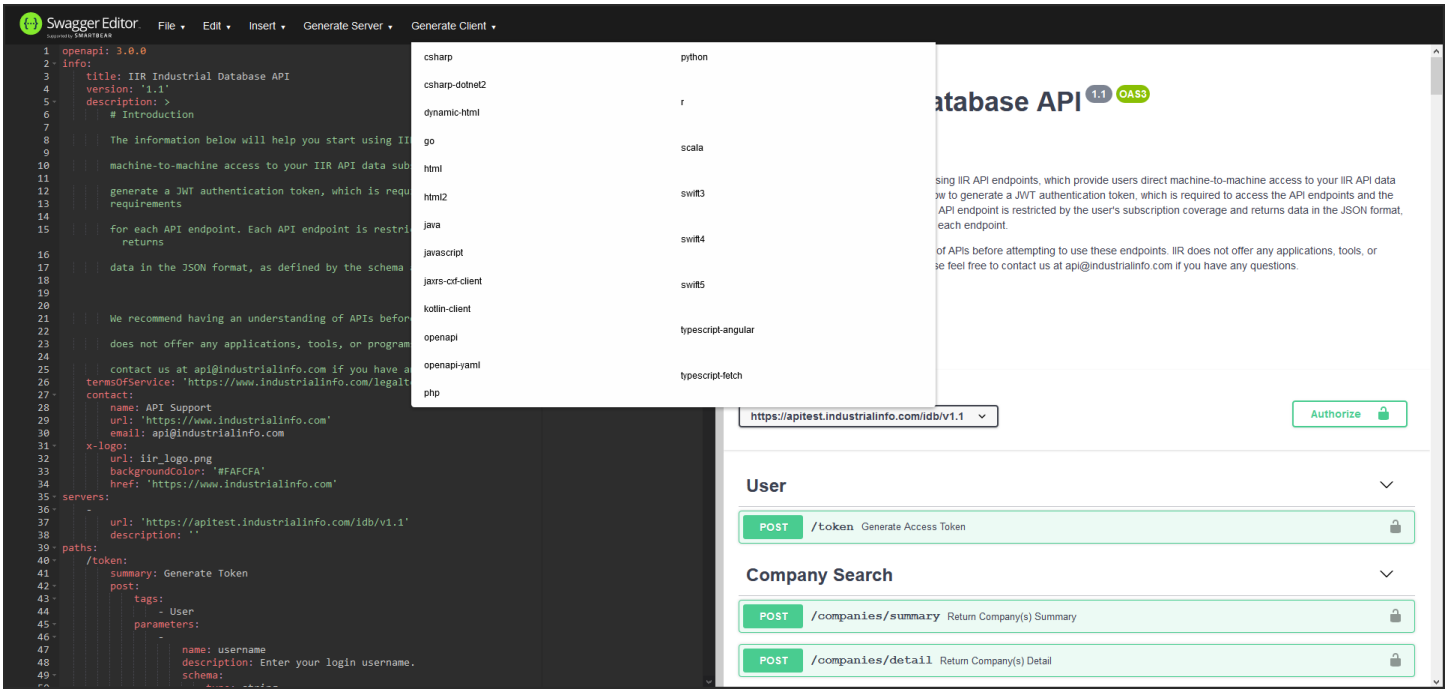
One advantage of using OpenAPI Spec is that the API Definition files can be used to create server stubs and client SDKs automatically by code-generator tools. We have extensively tested OpenAPI Client Generators such as: Swagger Codegen, APIMatic, AutoRest, OpenAPI Generator, NSwag, and others. However, the result is a mixed bag, as the tooling support for OpenAPI V3 is still inconsistent so far.

In general, we recommend these two tools for client code generation:

(1) Swagger Editor or Swagger CodeGen (free)

https://editor.swagger.io/

https://swagger.io/tools/swagger-codegen/

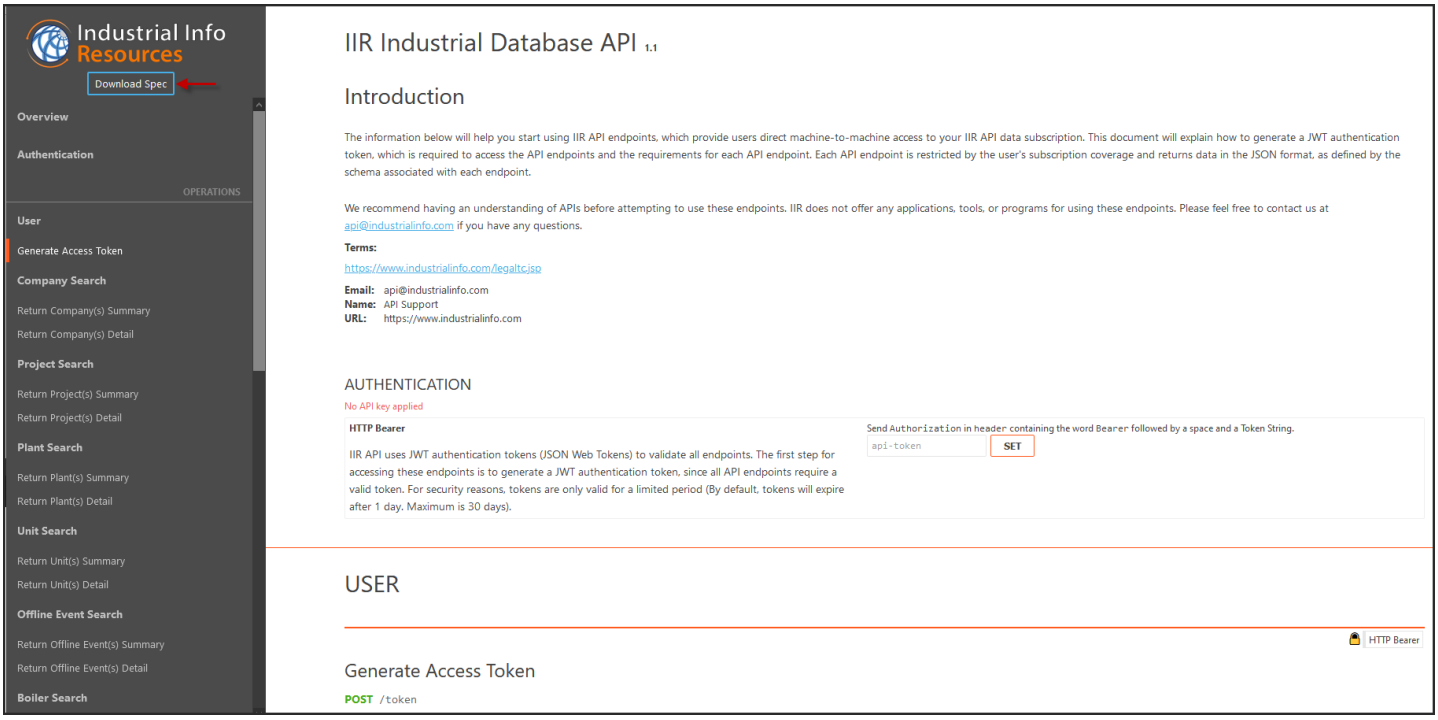


(2) APIMatic (paid)

https://www.apimatic.io/

Overall, APIMatic has the most complete features and even a start-up tutorial for different SDK.

IIR IDB API OpenAPI spec can be downloaded from RapiDoc:



(3) The following are generated client code samples in languages supported by our codebase:

1. Javascript:

   a. ES6 code generated by **Swagger Editor:**

https://api.industrialinfo.com/apiExample/openAPICodeGen/SwaggerEditor_JS-client.zip

   b. Typescript code generated by **Autorest**:

https://api.industrialinfo.com/apiExample/openAPICodeGen/Autorest_Typescript-client.zip

https://github.com/Azure/autorest

2. Java:

   a. Sample code generated by **Swagger Editor:**

https://api.industrialinfo.com/apiExample/openAPICodeGen/SwaggerEditor_Java-client.zip

   b. Sample code generated by **Autorest:**

https://api.industrialinfo.com/apiExample/openAPICodeGen/Autorest_Java-client.zip

3. C#:

   a. Sample code generated by **Swagger Editor:**

https://api.industrialinfo.com/apiExample/openAPICodeGen/SwaggerEditor_csharp-client.zip