

Machine And JDLink API Overview

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Agenda

Saturday, December 7, 2019

- Machine APIs
 - High level overview of the API options for machine data
 - Real world examples of the data these APIs provide
 - Introduction to the Developer.Deere.com documentation for machine APIs
- MyJohnDeere API vs JDLink Machine Data API

Machine APIs

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Machine APIs

- Machine List
- Location
- Engine Hours
- Notifications

JDLink™ – Enabling Technology

- Telematics Gateway to transfer data between cloud and machine (4G LTE)
- Eliminates the need for an USB device
- Captures machine data
- Enables data streaming
- Enables live connection
 - Remote Display Access
 - Adjustment of machine settings
 - Service packages from dealers
 - Real-time data
- Retrofit for non-Deere machines



Machine APIs – Machine List

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Machine API – Machine List

- List of all machines

JDLink Dashboard

Search JDLink™

1DW944KXVJF693028
1DW944KXVJF693028
JOHN DEERE C&F MARKETING FLEET

1DW844LAEKF697304
1DW844LAEKF697304
JOHN DEERE C&F MARKETING FLEET

1DW648LBCJF690814
1DW648LBCJF690814
JOHN DEERE C&F MARKETING FLEET

1T0650KKPHF321326
1T0650KKPHF321326
JOHN DEERE C&F MARKETING FLEET

1DW643LBEJF690815
1DW643LBEJF690815
JOHN DEERE C&F MARKETING FLEET

1T0950KLLKF351948
1T0950KLLKF351948
JOHN DEERE C&F MARKETING FLEET

1T0850LPAJF338742
1T0850LPAJF338742
JOHN DEERE C&F MARKETING FLEET

1T0850LXJKF354260
1T0850LXJKF354260
JOHN DEERE C&F MARKETING FLEET

1DW772GPVJF693171
1DW772GPVJF693171
JOHN DEERE C&F MARKETING FLEET

1T0950KPTHF317767
1T0950KPTHF317767

MapSatellite

Operations Center: Map

Equipment

GRAIN DRILL1

OTHER26

+1DW944KXVKF693421 De...

1DW643LBEJF690815

1DW648LBCJF690814

1DW672GPJJF693180

1DW772GPAJF693186

1DW772GPVJF693171

1DW843LBKJF693079

1DW844KACHF682992
Pending Registration

1DW844KATHF681438

1DW844LAEKF697304

1DW872GPEJF686800

1DW944KXPJE685267

1DW944KXVJF693028

1DW948LBAJF690819

1FF2654GVKF260086

Verizon12:49 PM

CloseEquipment ListSort

Search

Scan a barcode

1DW944KXVJF693028
83% Fuel / 76% DEF
23 min ago

1DW843LBKJF693079
100% Fuel / -- DEF
25 min ago

+1DW944KXVKF693421 D...
-- Fuel / -- DEF
25 min ago

1DW672GPJJF693180
92% Fuel / -- DEF
26 min ago

1WJ1270GJJF004251
57% Fuel / -- DEF
28 min ago

1T0950KPJJF334109
100% Fuel / 100% DEF
29 min ago

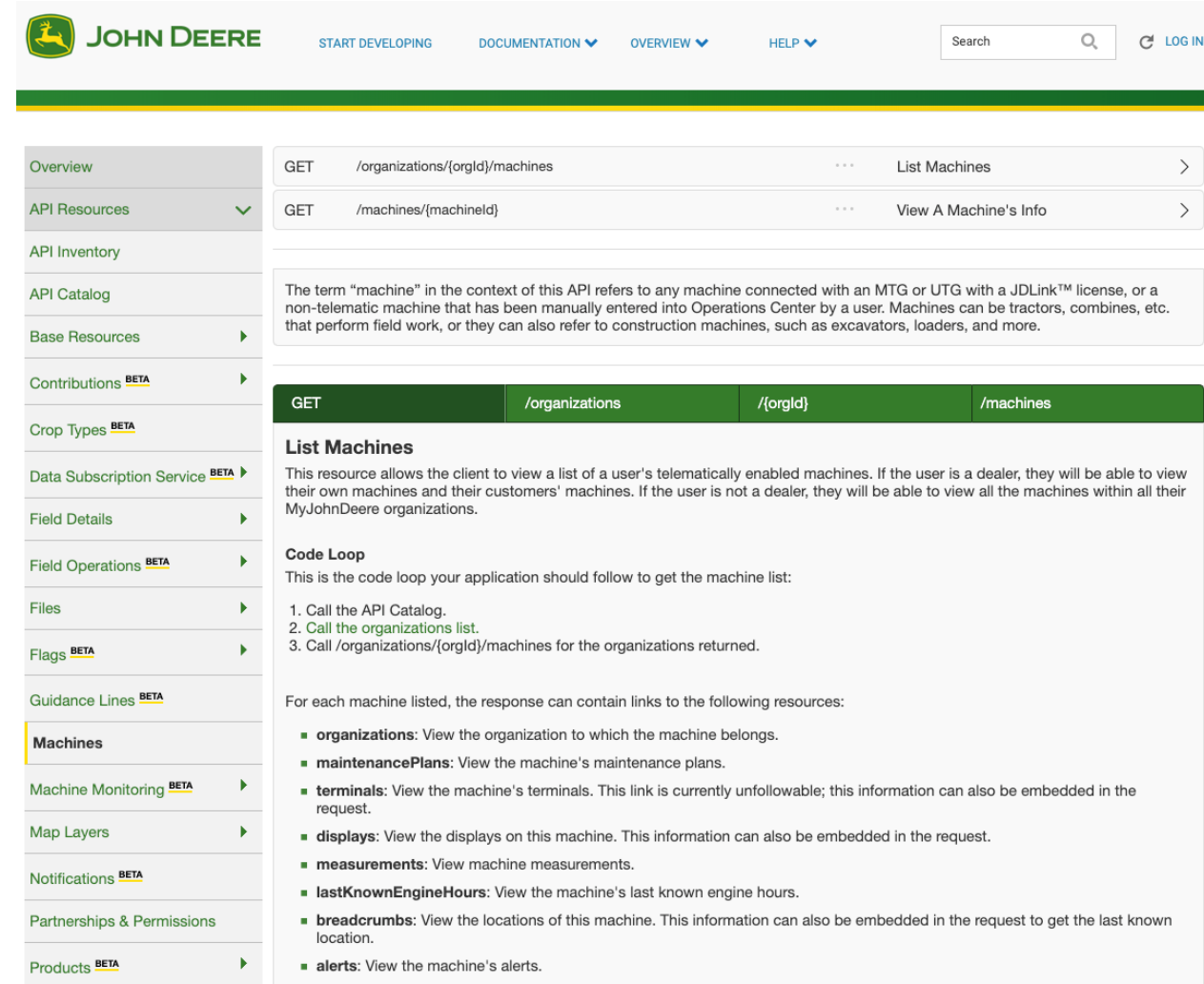
1T0950KPTHF317767

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Machine API – Machine List

Example API response (<https://partnerapi.deere.com/platform/machines>)

```
"values": [
{
"@type": "Machine",
"visualizationCategory": "spinnerSpreader",
"machineCategories": {
"@type": "MachineCategories",
"machineCategories": [
{
"@type": "MachineCategory",
"name": "JOHN DEERE",
"id": "1",
"type": "Make"
},
{
"@type": "MachineCategory",
"name": "F4365",
"id": "4141162",
"type": "Model"
},
{
"@type": "MachineCategory",
"name": "Nutrient Application",
"id": "4280867",
"type": "Type"
},
{
"@type": "MachineCategory",
"name": "N 47110",
"type": "DMC"
}
]
}
],
```



The screenshot shows the John Deere API documentation interface. At the top is the John Deere logo and navigation links: START DEVELOPING, DOCUMENTATION, OVERVIEW, and HELP. A search bar and a LOG IN link are also present. On the left is a sidebar menu with various API sections: Overview, API Resources (checked), API Inventory, API Catalog, Base Resources, Contributions, Crop Types, Data Subscription Service, Field Details, Field Operations, Files, Flags, Guidance Lines, Machines (highlighted), Machine Monitoring, Map Layers, Notifications, Partnerships & Permissions, and Products. The main content area displays the 'List Machines' endpoint details. It includes a table of API endpoints with methods (GET), paths (/organizations/{orgId}/machines and /machines/{machineId}), and descriptions. Below this, a text box explains the definition of a 'machine' in the context of the API. Further down, there's a section for the 'List Machines' endpoint, which includes a description of the resource, a 'Code Loop' section with a 3-step process for retrieving the machine list, and a list of resources that can be linked to each machine in the response.

Method	Path	Description
GET	/organizations/{orgId}/machines	List Machines
GET	/machines/{machineId}	View A Machine's Info

The term "machine" in the context of this API refers to any machine connected with an MTG or UTG with a JDLink™ license, or a non-telematic machine that has been manually entered into Operations Center by a user. Machines can be tractors, combines, etc. that perform field work, or they can also refer to construction machines, such as excavators, loaders, and more.

List Machines

This resource allows the client to view a list of a user's telematically enabled machines. If the user is a dealer, they will be able to view their own machines and their customers' machines. If the user is not a dealer, they will be able to view all the machines within all their MyJohnDeere organizations.

Code Loop

This is the code loop your application should follow to get the machine list:

1. Call the API Catalog.
2. Call the organizations list.
3. Call /organizations/{orgId}/machines for the organizations returned.

For each machine listed, the response can contain links to the following resources:

- **organizations**: View the organization to which the machine belongs.
- **maintenancePlans**: View the machine's maintenance plans.
- **terminals**: View the machine's terminals. This link is currently unfollowable; this information can also be embedded in the request.
- **displays**: View the displays on this machine. This information can also be embedded in the request.
- **measurements**: View machine measurements.
- **lastKnownEngineHours**: View the machine's last known engine hours.
- **breadcrumbs**: View the locations of this machine. This information can also be embedded in the request to get the last known location.
- **alerts**: View the machine's alerts.

Machine APIs – Location

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Machine API – Location

- Where a machine is located in the world at a point in time

JDLink Dashboard

Search JDLink™

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1DW944KXVJF693028
JOHN DEERE C&F MARKETING FLEET

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JOHN DEERE C&F MARKETING FLEET

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JOHN DEERE C&F MARKETING FLEET

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JOHN DEERE C&F MARKETING FLEET

1DW772GPVJF693171
1DW772GPVJF693171
JOHN DEERE C&F MARKETING FLEET

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1T0950KPTHF317767

Map

Satellite

Machine Analyzer

View

Edit Views

C&F Performance

Group by

Machine

Organization

Date Range

This Year

01/01/2019

09/12/2019

304

Machine Type

4wd Loader

844K-III AGGREGA...

844L AGGREGATE ...

1DW844LAEKF6...

944K

Crawler Dozer

Forestry Swing Machine

Verizon 12:28 PM

Map

Minneapolis

Green Bay

Rochester

Oshkosh

Madison

Milwaukee

Rockford

Chicago

Naperville

Peoria

St. Louis

Columbia

Springfield

Mark Twain National Forest

Missouri

IOWA

ILLINOIS

WISCONSIN

4wd Loader

844L

Google

Map

Location

Layers

Search

JOHN DEERE C&F MARKETING FLEET andy everett

1DW844LAEKF697304

1DW844LAEKF697304

JOHN DEERE C&F MARKETING

Map Data

Terms of Use

as of 09/12/2019

Alerts

85%

Fuel

JDLink Dashboard

View more machine details

Maintenance Manager


View and setup maintenance plans

Terminale

Machine API – Location

Example api response (<https://partnerapi.deere.com/platform/machines/321654/locationHistory>)

```
"values": [
{
  "@type": "ReportedLocation",
  "point": {
    "@type": "Point",
    "lat": 42.973833,
    "lon": -86.070722
  },
  "eventTimestamp": "2019-09-12T05:31:05.000Z",
  "gpsFixTimestamp": "2019-09-12T05:30:59.000Z",
  "links": [
    {
      "@type": "Link",
      "rel": "machine",
      "uri": "https://partnerapi.deere.com/platform/machines/296544"
    }
  ]
},
{
  "@type": "ReportedLocation",
  "point": {
    "@type": "Point",
    "lat": 42.973833,
    "lon": -86.07075
  },
  "eventTimestamp": "2019-09-11T17:32:49.000Z",
  "gpsFixTimestamp": "2019-09-11T10:35:25.000Z",
}
```

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Search

LOG IN

Overview

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Engine Hours

Hours of Operation

Device State Reports

Machine Location History

GET /machines/{id}/locationHistory

Machine Location History

Become a beta tester

GET /machines /{id} /locationHistory

Machine Location History

The machine location service allows the client to view a list of location reports for a machine. A location report will include the machine's longitude, latitude, and altitude. For each location report, the response will link to the **/machines** resource.

Request URI

GET <https://sandboxapi.deere.com/platform/machines/{id}/locationHistory>

Accept: application/vnd.deere.axiom.v3+json

Parameters

Parameter	Type	Example	Description	Default	In	Required?
id	string	5432	Machine ID	N/A	path	Yes
lastKnown	boolean	false	Includes the last known machine location.	N/A	query	No
startDate	datetime	2010-10-04T14:35:05.000Z	Retrieves results that occurred after a specified date. The format is in the ISO 8601 Standard.	N/A	query	No
endDate	datetime	2010-10-04T14:38:35.000Z	Retrieves results that occurred before a specified date. The format is in the ISO 8601 Standard.	N/A	query	No

Response Details

Field	Type	Example	Description
point	N/A	N/A	Contains the <code><lat></code> , <code><lon></code> , and <code><altitude></code> tags.
lat	double	41.688612	The latitude of the machine's location.
lon	double	-93.693612	The longitude of the machine's location.
altitude	measurement AsDouble	See sample response below.	The altitude of the machine's location. The value and unit of measurement are both included.
event Timestamp	datetime	2012-11-07T18:42:07.186Z	Timestamp of the machine location report. All timestamps follow the ISO 8601 standard format.
gpsFixTimestamp	datetime	2010-10-	The last time the machine noted its GPS location.

Machine APIs – Engine Hours

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Machine API – Engine Hours

- The number of hours that the engine has been running

- Search JDLink™
- 1DW648LBCJF690814**
1DW648LBCJF690814
JOHN DEERE C&F MARKETING FLEET
- 1T0650KKPHF321326**
1T0650KKPHF321326
JOHN DEERE C&F MARKETING FLEET
- 1DW643LBEJF690815**
1DW643LBEJF690815
JOHN DEERE C&F MARKETING FLEET
- 1T0950KLLKF351948**
1T0950KLLKF351948
JOHN DEERE C&F MARKETING FLEET
- 1T0850LPAJF338742**
1T0850LPAJF338742
JOHN DEERE C&F MARKETING FLEET
- 1T0850LXJKF354260**
1T0850LXJKF354260
JOHN DEERE C&F MARKETING FLEET
- 1DW772GPVJF693171**
1DW772GPVJF693171
JOHN DEERE C&F MARKETING FLEET
- 1T0950KPTHF317767**
1T0950KPTHF317767
JOHN DEERE C&F MARKETING FLEET

1DW844LAЕКF697304
1DW844LAЕКF697304
JOHN DEERE C&F MARKETING FLE...
September 12, 2019 12:26 PM

Other

+ Add Tag

Aug 14, 2019 to Sep 12, 2019

as of September 12, 2019 12:26 PM

Machine Details

4 Alerts

36.75 Engine Hours

85% Fuel

September 6, 2019 - September 12, 2019

Machine Hours of Operation

14.93

Period Engine Hours

09/12		5.61
09/11		9.27
09/10		0.05
09/09		0.00
09/08		0.00
09/07		0.00
09/06		0.00

00:00 03:00 06:00 09:00 12:00 15:00 18:00 21:00

Off On Unavailable

Show All

Map

1DW844LAЕКF697304

74%

68%

37 Hrs.

--

--

--

Idle

Working


Transport

LAST UPDATED 1 HR AGO

Machine API – Engine Hours

Example api response (<https://partnerapi.deere.com/platform/machines/321654/engineHours>)

```
"values": [
{
  "@type": "EngineHours",
  "reading": {
    "@type": "measurementAsDouble",
    "valueAsDouble": 36.75,
    "unit": "Hours"
  },
  "reportTime": "2019-09-12T09:55:05.000Z",
  "links": [
    {
      "@type": "Link",
      "rel": "machine",
      "uri": "https://partnerapi.deere.com/platform/machines/411754"
    }
  ]
}
]
```

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Files▶

Flags **BETA**▶

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Alerts

Engine Hours

Hours of Operation

Device State Reports

Machine Location History

GET /machines/{id}/engineHours Engine Hours

Become a beta tester

GET /machines /{id} /engineHours

Engine Hours

The engine hours service returns the last reported number of hours that a machine's engine has recorded. Each response includes a timestamp for the report and the source of the report. For each returned engine hours report, the response will include a link to the machine's information.

Request URI

GET <https://sandboxapi.deere.com/platform/machines/{id}/engineHours>

Accept: application/vnd.deere.axiom.v3+json

Parameters

Parameter	Type	Example	Description	Default	In	Required?
id	string	5432	Machine ID.	N/A	path	Yes
startDate	datetime	2015-02-03T9:00:00.000Z	Start date & time.	N/A	query	No
endDate	datetime	2015-02-03T10:42:24.282Z	End date & time.	N/A	query	No
lastKnown	boolean	true	If true, returned only the last known engine hour reading. startDate and endDate are ignored.	false	query	No

Response Details

Field	Type	Example	Description
reading	measurementAsDouble	<valueAsDouble> 523.5166666666667 </valueAsDouble>	The number of hours the engine has been running.
reportTime	datetime	2010-10-04T14:35:05.000Z	Timestamp at which the report was created.
source ¹	string	CI	Device which collected the data.

Please Note: This API does not support eTags.

Available Links

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Machine APIs – Notifications

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Machine API – Notifications

- DTCs and other messages related to a machine



Search JDLink™

**1DW944KXPJE685267**

1DW944KXPJE685267

JOHN DEERE C&F MARKETING FLEET

**1WJ1270GJJF004251**

1WJ1270GJJF004251

JOHN DEERE C&F MARKETING FLEET

**1T01050PPGF001250**

1T01050PPGF001250

JOHN DEERE C&F MARKETING FLEET

**1DW948LBAJF690819**

1DW948LBAJF690819

JOHN DEERE C&F MARKETING FLEET

**1DW843LBKJF693079**

1DW843LBKJF693079

JOHN DEERE C&F MARKETING FLEET

**1FF2654GVKF260086**

1FF2654GVKF260086

JOHN DEERE C&F MARKETING FLEET

**1DW672GPJJF693180**

1DW672GPJJF693180

JOHN DEERE C&F MARKETING FLEET

**1WJ1510GLJF003952**

1WJ1510GLJF003952



137/137

**YELLOW TCU 523952.31 Traction control disabled. - Cycle park brake to re-enable.**
August 23, 2019 7:35 AM**YELLOW TCU 523952.31 Traction control disabled. - Cycle park brake to re-enable.**
August 23, 2019 7:08 AM**YELLOW TCU 523952.31 Traction control disabled. - Cycle park brake to re-enable.**
August 23, 2019 6:53 AM**YELLOW TCU 523952.31 Traction control disabled. - Cycle park brake to re-enable.**
August 21, 2019 1:49 PM**YELLOW TCU 523952.31 Traction control disabled. - Cycle park brake to re-enable.**
August 19, 2019 8:52 PM**YELLOW TCU 523952.31 Traction control disabled. - Cycle park brake to re-enable.**
August 17, 2019 5:13 PM**Low Fuel**
September 11, 2019 11:07 PM**Low Fuel**
September 11, 2019 12:53 PM

Map

Notifications



Today

Dubuque - Movement **1DW772GPAJF693186** Sep 12, 2019 10:50 AM**Dubuque - Movement** **1DW672GPJJF693180** Sep 12, 2019 09:20 AM**Dubuque - Engine Started** **1DW672GPJJF693180** Sep 12, 2019 09:07 AM


Sep 11, 2019

Low Fuel 1DW944KXPJE685267 Sep 11, 2019 11:07 PM**Dubuque - Movement** **1DW772GPAJF693186** Sep 11, 2019 05:31 PM **INFO ECU 001569.31 Engine derated. - Engine power limited.****1DW843LBKJF693079** Sep 11, 2019 03:33 PM



Machine API – Notifications

Example api response (https://partnerapi.deere.com/platform/notificationEvents)

```
"values":[
{
  "@type":"GroupedNotifications",
  "geometries":[{"type":"Point","coordinates":[-90.1805376,41.4475633]]},
  "title":"Andy Fence - Enter",
  "text":"This machine entered the defined Geofence boundaries. \r\n\r\n**GEOFENCE LOCATION AT THE TIME OF ALERT** \r\n41.4475633, -90.1805376",
  "severity":"HIGH",
  "sourceEvent":"803-99019292",
  "eventType":"CURFENCE_ALERT",
  "minimizedNotifications":[
    {
      "@type":"MinimizedNotification",
      "additionalDetails":[
        {
          "@type":"AdditionalDetail",
          "name":"targetResourceName",
          "value":"Mikes 9rx"
        },
        {
          "@type":"AdditionalDetail",
          "name":"latitude",
          "value":"41.4475633"
        },
        {
          "@type":"AdditionalDetail",
          "name":"longitude",
          "value":"-90.1805376"
        }
      ]
    }
  ]
}
```

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Machines

Machine Monitoring **BETA** ▶

Map Layers ▶

Notifications **BETA**

Partnerships & Permissions

Products **BETA** ▶

Request Beta Access

POST /notificationEvents ... Create Notification Event >

DELETE /notificationEvents/{id} ... Delete Notification Event >

GET /notificationEvents/{id}/status ... View Notification Event Status >

GET /organizations/{orgId}/notifications/events ... Search Notifications for an Organization >

Become a beta tester

POST /notificationEvents

Create Notification Event

This resource creates an event that Operations Center will use to generate notifications. These notifications will be received by anyone who is subscribed to your services. Each notification event will include a link to **source**, which will define the event.

Request URI

POST https://sandboxapi.deere.com/platform/notificationEvents

Accept: application/vnd.deere.axiom.v3+json

Content-Type: application/vnd.deere.axiom.v3+json

Request Details

Field	Type	Example	Description
title	string	Some Title	Event title.
text	string	Detailed event text.	Event description.
severity ¹	string	HIGH	Event severity.
eventType ²	string	PEST	Event type.
additionalDetails	---	See sample request below.	More event details.
timeRange	---	See sample request below.	Time range of the event. Includes startDate and endDate.
eventAssociation	---	See sample request below.	Instructions on how to associate the resulting Notifications with resources.

Target Resource Event Association

MyJohnDeere API vs JDLink Machine Data API

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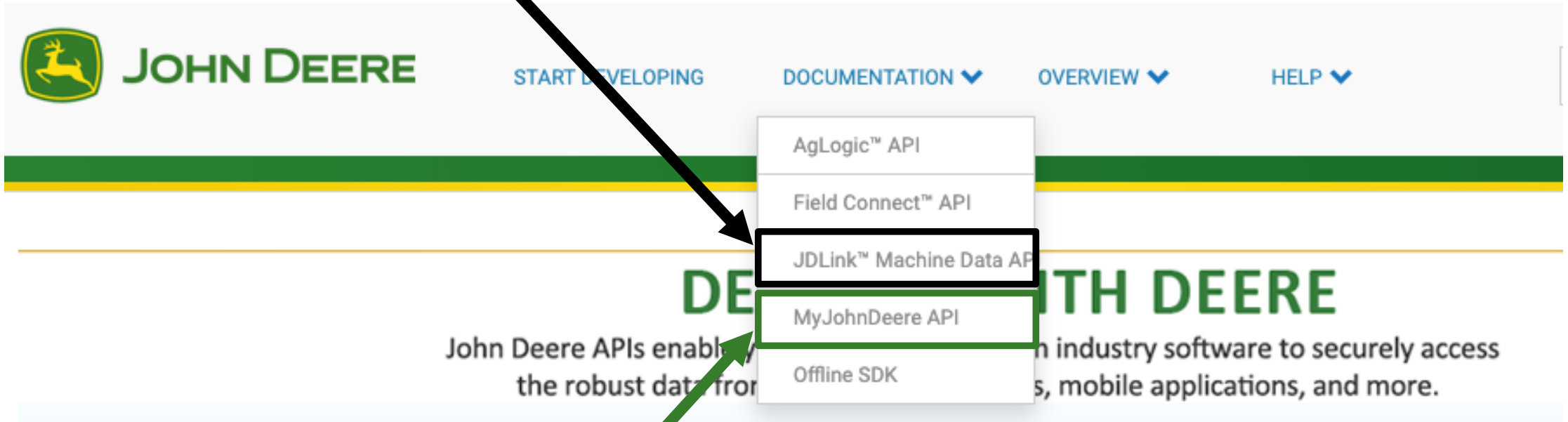


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MyJohnDeere API vs JDLink Machine Data API

MyJohnDeere API



JDLink Machine Data API

MyJohnDeere API vs JDLink Machine Data API

	MyJohnDeere API	JDLink Machine Data API	Comments
Specification	John Deere Created	ISO 15143-3 Spec (AEMP 2)	MyJohnDeere has far more future flexibility, as it isn't tied to a slow moving ISO spec
Format	JSON	XML	
Data Access	Staff Member or Partnerships	Staff Member Only	JDLink API data accessibility may be hard to scale
Interaction	Multiple calls to retrieve all data	Single call to get most machine data	
Historical support	Full History Available	Not Available	JDLink only supports latest known information
Machine Alerts / DTCs	Available	Not Available	
Data	Flexible	Fixed	

Q&A / Feedback

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