Athena IR-Tech Transp-IR API Specification Doc

Revision	Date	Author	Description
1.0	2023 May 30	Buddhika Biyagama	Initial draft
1.1	2023 Aug 17	Jay Holata	Revision
1.2	2023 Sep 5	Jay Holata	Final Revision
1.3	2023 Oct 26	Buddhika	Add new endpoints

Content

1. Getting Started

To access the API as a developer you'll need to retrieve your customer's unique Client ID from the Transp-IR dashboard of your customer. Only customers who have purchased the Precision level subscription will have a Client ID assigned to them.

To start, contact us and we'll send you 2 things.

1. An Athena Transp-IR User Account for you that lets you view the Athena Transp-IR Staging environment using our interactive front-end, to help you understand the data structure and presentation.
2. An Integration Partner User Agreement to be signed and returned.

From this point, once the User Agreement has been signed and returned, you can begin to build an API integration with data coming through the Athena Staging environment. Beyond this, you'll need to have the Athena Admin at your client confirm in writing (email is best) directly to admin@athenairtech.com that they approve the sharing of their data with you. They should include:

- The Organisation Name in Athena from which their data can be shared;
- The company to which access to the data can be granted (your company); and
- The duration of access (if nothing is specified, a default duration of 1 year will be applied).

Once this written confirmation is received by Athena, you'll be issued an additional API Key for the system/s that they own, which will enable you to extract their data for further use in line

with the practices outlined in the User Agreement.

2. Basic Information

The URL for the production site is https://api.athenairtech.com

For testing, the URL for the staging environment where testing occurs is https://api.staging.athenairtech.com/v1

To access any of the API resources, you must first be authorized. This can be achieved using your client identifier and API Key to request a token.

Authorization

To access any of our API resources, you must provide the following header parameters.

Name	Required	Description
x-client-id	required	Your unique client identifier
x-api-key	required	Your API Key

Pagination

To paginate, you could provide the following header parameters.

Name	Required	Description
x-limit	optional	Each request can contain up to 500 records
x-next-page-key	optional	Response header `x-next-page-key` is used to fetch the next page of results.

Athena Organisational and Data Structure

Athena has a defined structure for customers, their sites, blocks and related devices and seasonal data. Each customer is structured as follows:

Organisation - Customer company

- Site A - A geographical location
- Site B - 2nd location
- Site C - xxx additional locations

Note: For organisations that are consultants that have multiple clients, the consultant is considered the organisation and each client is then considered a site.

- Block 1 - Any area within a site that is usually a specific crop or cultivar or defined by a zoned irrigation valve.
- Block 2 - 2nd block
- Block 3 - n - additional blocks

- Device 1 - Athena field units that record the data
- Device 2 - 2nd device
- Device 3 - n - additional devices in the block

3. Get Site Information

This returns general information about a site. An organisation can have multiple geographical locations that are considered sites within Athena.

HTTP request

```
GET https://api.athenairtech.com/v1/site
```

Query parameters

Name	Required	Description
uid string	required	Athena Site UID. Site UID is copied from the Transp-IR dashboard. To get the UID from the dashboard click on Sites . Click on the copy button next to the Site-UID for the site you are accessing. This same concept of UID and copying also exists in the dashboard for blocks and devices.

https://api.staging.athenairtech.com/v1/site?uid=SI-APM

Response body

If successful, the response body contains the information for the Site including the list of blocks in the site.


```
{
  "address" : {
    "state" : "South Australia",
    "postal_code" : "5064",
    "geolocation" : {
      "lng" : "138.6338539",
      "lat" : "-34.9687753"
    },
    "administrative_area_level_2" : "Mitcham",
    "country_long_name" : "Australia",
    "url" : "https://maps.google.com/?cid=1081768075369040080",
    "address" : "Urrbrae SA 5064, Australia",
    "administrative_area_level_2_long_name" : "City of Mitcham",
    "administrative_area_level_1" : "SA",
    "administrative_area_level_1_long_name" : "South Australia",
    "postal_code_long_name" : "5064",
    "country" : "AU",
    "locality" : "Urrbrae",
    "locality_long_name" : "Urrbrae"
  },
  "block" : [
    {
      "crop_variety" : "almond_sdad",
      "block_season_year" : 2023,
      "block_name" : "Almond Test Block",
      "crop_species" : "almond",
      "uid" : "BL-ASK"
    },
    {
      "crop_variety" : "wine_grape_cabernet_sauvignon",
      "block_season_year" : 2023,
      "block_name" : "Grape Test Block",
      "crop_species" : "wine_grape",
      "uid" : "BL-ASJ"
    },
    {
      "crop_variety" : "wine_grape_cabernet_sauvignon",
      "block_season_year" : 2023,
      "block_name" : "Citrus Test Block",
      "crop_species" : "wine_grape",
      "uid" : "BL-ASL"
    }
  ],
  "uid" : "SI-APM",
  "time_zone" : "Australia/Adelaide",
  "site_name" : "Demo Site"
}
```


4. Get Site User Inputs

Returns site user entered information for:

- Rainfall

- Notes

Only rainfall and notes are recorded at the site level as irrigation is specific to a block and grape sugar content is specific to those blocks that have a grape variety.

HTTP request

```
GET https://api.athenairtech.com/v1/site/readings
```

Query parameters

Name	Required	Description
uid string	required	Athena site UID
type date	required	• RFL - Rainfall • NTE - Notes
from date	required	Date format is “YYYY-MM-DD”
to date	optional	Date format is “YYYY-MM-DD”

Example Request

```
GET /readings?uid=B_AVM&type=RFL&from=2023-07-15
```

Response body

If successful, the response body contains an array of data.

{
"data": [
{
"created_at": "2023-07-15T08:00:06.000+09:30",
"amount": 200, }]}

5. Post Site rainfall and user notes

- Rainfall
- Notes

HTTP request

```
POST https://api.athenairtech.com/v1/site/readings
```

Request Body Parameters

<table>
<tr><th>Name</th><th>Required</th><th>Description</th></tr>
<tr><td>uid
string</td><td>required</td><td>Athena site UID</td></tr>
<tr><td>type
date</td><td>required</td><td>• RFL - Rainfall
• NTE - Notes</td></tr>
<tr><td>data
array</td><td>required</td><td>RFL
<table>
<tr><td>created_at
date</td><td>required</td><td>ISO Date format is “YYYY-MM-DD”</td></tr>
<tr><td>amount
object</td><td>required</td><td>{
"value": 2.2,
"unit": ”mm”, # mm or inc
}</td></tr>
</table>
NTE
<table>
<tr><td>created_at
date</td><td>required</td><td>ISO DateTime format is “YYYY-MM-DD hh:mm:ss”</td></tr>
<tr><td>title
string</td><td>required</td><td></td></tr>
<tr><td>content
text</td><td>required</td><td></td></tr>
</table></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Example Request

```
POST site/readings
{
    "uid": “SI-ASK”,
    "type": “RFL”,
    "data": [{
          "created_at": “2023-10-26 14:30:00”
          "amount": {
               "value": 10,
               "unit": ”mm”,
          }
        },
        {
          "created_at": “2023-10-27 14:30:00”
          "amount": {
               "value": 20,
               "unit": ”mm”,
          }
        }
    ]
 }
```

Response body

If successful, the response body contains a success response.
{status: “ok”}

6. Get Block Info

Returns Block information.

HTTP request

```
GET https://api.athenairtech.com/v1/block
```

Query parameters

Name	Required	Description
uid string	required	Athena block UID

Example Request

```
GET /block?uid=BL_AFG
```

Response body

If successful, the response body contains an instance of block.
{
"uid": "BL_AFG",
"site_name": "My Test Site",
"block_name": "Backyard",
"time_zone": "Australia/Adelaide",
"crop_variety": "wine_grape_shiraz",
"block_season_year": 2023,
},

7. Get Block User Input

Returns block user input for:

- Irrigation
- Grape sugar content
- notes

A separate request must be made for each type of information for the block.

HTTP request

```
GET https://api.athenairtech.com/v1/block/readings
```

Query parameters

Name	Required	Description
uid string	required	Athena block UID
type date	required	IRT - Irrigation GSC - Grape sugar content (only applies if crop is winegrape) NTE - Notes
from date	required	Date format is “YYYY-MM-DD”.
to date	optional	Date format is “YYYY-MM-DD”

Example Request

```
GET /readings?uid=BL_AVM&type=irrigation&from=2023-07-15
```

Response body

If successful, the response body contains an array of data.

```
{
"data": [
   {
      "created_at": "2023-07-15T08:00:06.000+09:30",
      "amount": 200,
   },
]}
```

8. Post Block irrigation, grape sugar content and notes

- Irrigation
- Grape sugar content
- notes

HTTP request

```
POST https://api.athenairtech.com/v1/block/readings
```

Request Body Parameters

Name	Required	Description

uid string	required	Athena block UID
type date	required	• IRT - Irrigation • GSC - Grape sugar content (only applies if crop is winegrape) • NTE - Notes

data
array
	required	**GSC**
		
		created_at date — required — ISO DateTime format is "YYYY-MM-DD hh:mm:ss"
		
		amount object — required —
		{
		"value": 2.2,
		"unit": "bx", # bx or be
		}
		bx - Brix ,
		be - Baume
		
		NTE
		
		created_at date — required — ISO DateTime format is "YYYY-MM-DD hh:mm:ss"
		
		title string — required
		
		content text — required
		
		IRT (As depth)
		
		created_at date — required — ISO DateTime format is "YYYY-MM-DD hh:mm:ss"
		
		amount object — required —
		{
		"value": 2.2,
		"unit": "mm",
		}
		mm - Millimeters
		inc - Inches
		
		IRT (As flow rate)
		- Irrigated area should be defined in the Block
		- Pump flow rate should be defined in the Block
		- Duration of irrigation can be defined as single value or start and end time
		
		created_at date — required — ISO DateTime format is "YYYY-MM-DD hh:mm:ss"
		
		duration object — required —
		Duration as a Single Value
		{
		"value": 10,
		"unit": "sec",
		}
		
		min - Minutes
		sec - Seconds
		hr - Hours
		
		Duration with Start and End Times:
		{
		"start_time": "15:45:00",
		"end_time": "15:55:00",
		}
		
		ISO time format "hh:mm:ss"
		3:45 PM: "15:45:00"
		8:30:25 AM: "08:30:25"

Example Request

```
POST /block/readings
{
  "uid": "BL-APU",
  "type": "IRT",
  "data": [
    {
      "created_at": "2023-10-27 14:30:00",
      "amount": {
        "value": 10,
        "unit": "inc"
      }
    },
    {
      "created_at": "2023-10-28 14:30:00",
      "duration": {
        "value": 2,
        "unit": "hr"
      }
    },
     {
      "created_at": "2023-10-29 14:30:00",
      "duration": {
        "start_time": "15:45:00",
        "end_time": "17:45:00"
      }
    }
  ]
}
```

Response body

If successful, the response body contains a success response.
{status: “ok”}

9. Get Device Info

Returns the following information about a device within a block

- Geolocation
- Device short UID
- Grape variety name
- Device version
- Site name
- Block name
- Season start date for this device
- Current phenological stage
- Species (Crop) UID
- Device ID - unique 13 digit device ID
- Season year
- Time zone
- Name - device name assigned by the user

For each device the settings are also returned that govern how the data is displayed on the Crop Water Index graph. This information is found in the dashboard at Settings / CWI Thresholds.

Crop Water Index (CWI) - This is generated once a day and represents the blue line on the graph.

Chart Thresholds and Phenological Stages - Each crop has defined phenological stages with start and end dates as defined by the user. The green optimal plant water status zone on

the CWI graph is represented by the thresholds in this section. Three “chart thresholds” are defined for each set of phenological stages. They are:

- Upper limit of green zone
- Lower limit of green zone
- Red line

Below each set of chart thresholds are the names of the starting and ending phenological stages for the chart thresholds.

The next section of information is about the units of measure that are defined in the dashboard in Settings / Units for each attribute that is displayed on the graph. The following attributes have their units of measure definable by the user:

- CWI - no unit defined
- VPD - vapour pressure deficit
- IR1AT - infrared sensor 1 canopy temperature
- IR2AT - infrared sensor 2 canopy temperature
- T_AMB - Ambient temperature
- RH - Relative humidity
- SOLAR_RAD - solar radiation

HTTP request

```
GET https://api.athenairtech.com/v1/device/
```

Query parameters

Name	Required	Description
uid string	required	Athena block device UID

Example Request

```
GET device/?uid=BD_AVM
```

Response body

If successful, the response body contains the device metadata including settings that guide the display of the device information on the CWI graph and dashboard.


```
{
  "geolocation" : {
    "lng" : "138.45255",
    "lat" : "-35.28148"
  },
  "uid" : "BD-AVR",
  "variety_name" : "Cabernet Sauvignon",
  "device_version" : "v1.0.0",
  "site_name" : "Demo Site",
  "block_name" : "Grape Test Block",
  "season_start_date" : "2023-08-02T06:52:31.467+09:30",
  "current_phenological_stage" : "budburst - flowering",
  "species_uid" : "wine_grape",
  "species_name" : "Wine Grape",
  "variety_uid" : "wine_grape_cabernet_sauvignon",
```

```
"phenological_stages" : [
  "budburst",
  "flowering",
  "veraison",
  "harvest"
],
"installed_at" : "2023-08-02T09:30:00.000+09:30",
"properties" : {
  "calculated" : [
    {
      "frequency" : "Once per day",
      "thresholds" : [
        {
          "chart_thresholds" : [
            "0.3",
            "0.7",
            "2.0"
          ],
          "phenological_stages" : [
            "budburst",
            "flowering"
          ]
        },
        {
          "chart_thresholds" : [
            "0.3",
            "0.45",
            "0.65"
          ],
          "phenological_stages" : [
            "flowering",
            "veraison"
          ]
        },
        {
          "chart_thresholds" : [
            "0.3",
            "0.45",
            "0.65"
          ],
          "phenological_stages" : [
            "veraison",
            "harvest"
          ]
        }
      ],
      "attribute" : "cwi",
      "description" : "Crop Water Index",
      "unit" : ""
    },
    {
      "frequency" : "Once per day",
      "attribute" : "vpd",
      "description" : "Vapor Pressure Deficit",
      "unit" : "kPa"
    }
  ],
  "readings" : [
    {
      "frequency" : "Every 10 minutes from 8:00 AM to 8:00 PM",
      "attribute" : "IR1AT",
      "description" : "IR Sensor 1 Canopy Temperature",
      "unit" : "°C"
    },
    {
      "frequency" : "Every 10 minutes from 8:00 AM to 8:00 PM",
      "attribute" : "IR2AT",
```

```
      "description" : "IR Sensor 2 Canopy Temperature",
      "unit" : "°C"
    },
    {
      "frequency" : "Every 10 minutes from 8:00 AM to 8:00 PM",
      "attribute" : "T_AMB",
      "description" : "Ambient Temp",
      "unit" : "°C"
    },
    {
      "frequency" : "Every 10 minutes from 8:00 AM to 8:00 PM",
      "attribute" : "RH",
      "description" : "Ambient RH",
      "unit" : "%"
    },
    {
      "frequency" : "Every 10 minutes from 8:00 AM to 8:00 PM",
      "attribute" : "vpd",
      "description" : "Vapor Pressure Deficit",
      "unit" : "kPa"
    },
    {
      "frequency" : "Every 10 minutes from 8:00 AM to 8:00 PM",
      "attribute" : "SOLAR_RAD",
      "description" : "Solar Radiation",
      "unit" : "lux"
    }
   ]
  },
  "device_uid" : "352656103192616",
  "season_year" : 2023,
  "time_zone" : "Australia/Adelaide",
  "name" : "Grape Test Unit"
}
```


10. Get Device Readings

Returns device readings (T_AMP, T_IR1….)

HTTP request

`GET https://api.athenairtech.com/v1/device/readings`

Query parameters

Name	Required	Description
uid string	required	Athena block device UID
from datetime	required	The beginning date/time for which you want the device readings.
to datetime	optional	The ending date/time for which you want the device readings. *If no ending date is provided, the default is to provide 24 hours of data.*

attributes string	optional	A comma-separated list of attribute names. If no attribute names are specified, then all attributes are returned. If any of the requested attributes are not found, they do not appear in the result. *The Device info API can be used to retrieve a list of available attribute names.*

Example Request

```
GET /readings?uid=BD_AVM&from=2023-07-15
```

Response body

If successful, the response body contains an array of measurements


```
{
"data": [
   {
      "created_at": "2023-07-15T08:00:06.000+09:30",
      "IR2AT": "11.5",
      "IR1AT": "11.5",
      "IR2OT": "11.0",
      "IR1OT": "11.1",
      "T_AMB": "11.2",
      "RH": "81.5"
   },
…
]}
```


11. Get Device Calculated Values

Returns calculated values of a device (CWI, VPD)

HTTP request

```
GET https://api.athenairtech.com/v1/device/calculated
```

Query parameters

Name	Required	Description
uid string	required	Athena block device UID
from datetime	required	The beginning date/time for which you want the device readings.
to datetime	optional	The ending date/time for which you want the device readings. *If no ending date is provided, the default is to provide 24 hours of data.*
attributes string	optional	A comma-separated list of attribute names. If no attribute names are specified, then all attributes are returned. If any of the requested attributes are not found, they do not appear in the result.

		The Device info API can be used to retrieve a list of available attribute names.

Example Request

```
GET /calculated?uid=BD_AVM&from=2023-07-15
```

Response body

If successful, the response body contains an array of data.


```
{
"data": [
  {
    "cwi": "1.67",
    "vpd": "0.67"
  },
...
 ]
}
```