Solis API Explained

Section A. API Sharing Process for Third-Party Monitoring

1. Customer requests API access from Solis and provides the following information.
   1) Company name and type.
   2) Reason for requesting API access (what will they do with the data?)
   3) Approximate number of sites registered to their SolisCloud account.
2. Solis US sends the Solis API form to customer: Solis API Third Party Sharing Agreement Form.docx
3. Customer signs and returns the form to Solis US
4. The Solis team sends the customer the Solis API document: SolisCloud Monitoring API v1.2.pdf
5. Solis team opens API access for the customer through SolisCloud:
   1) Only specific admins can do this (Igor, Darrin, and Michael for the US)
   2) On SolisCloud, click the Operation tab on the left
   3) Click Account Management, then click Installer Management
   4) Search the account director email address in the field that says "Input email"
   5) Click the orange Operation button on the right side of the screen in the same row as the account
   6) Click Permission settings and then click the toggle switch that says "OFF" in the API Activation Authority box. The switch should turn orange and then OFF should become ON

6. The customer will now have to log out of their SolisCloud account and then log back in
7. After that, the customer will be able to obtain the API access:
   1) Click on their icon in the top right corner of SolisCloud

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2) Click on Basic Settings
3) Click on API Management on the left side of the screen
4) Click the orange button that says "Activate now"
5) Scroll to the bottom and click "Agree and Activate"
6) Click "View Key" and then click "I have read and agree to disclaim"
7) Click "Verification code" to have a code sent to the email address of the account
8) Go to the email inbox, look for an email from Solis, and then obtain the code
9) Copy the code into the field on SolisCloud and then click "Confirm"
10) The API ID (API Key), the API Secret (KeySecret), and the API URL will be displayed. Click Confirm
11) The customer will use these three items along with the Solis API document to make API calls. When the code is being written, the three are used in the authorization process (see figure 1.1)
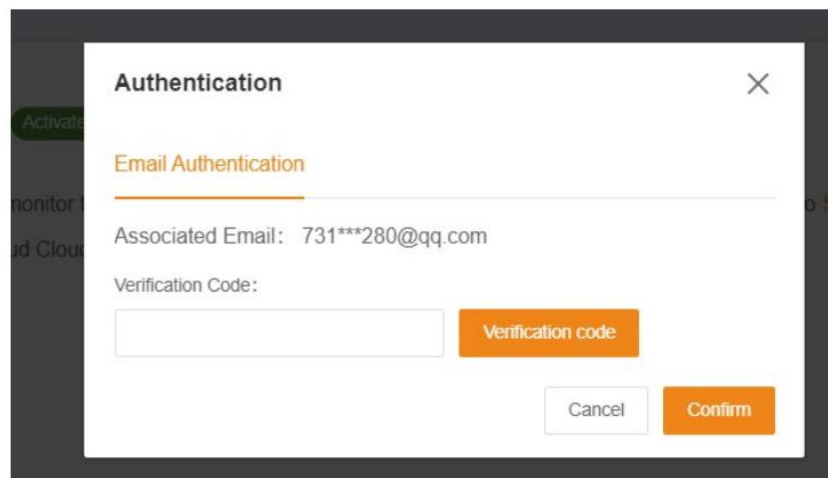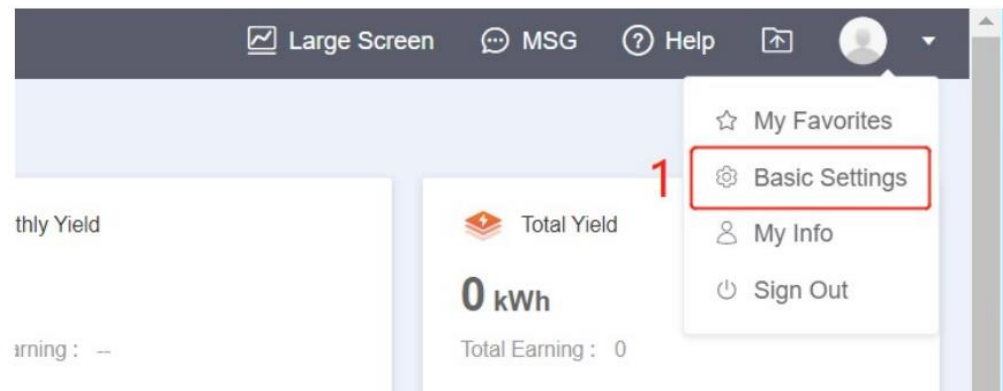
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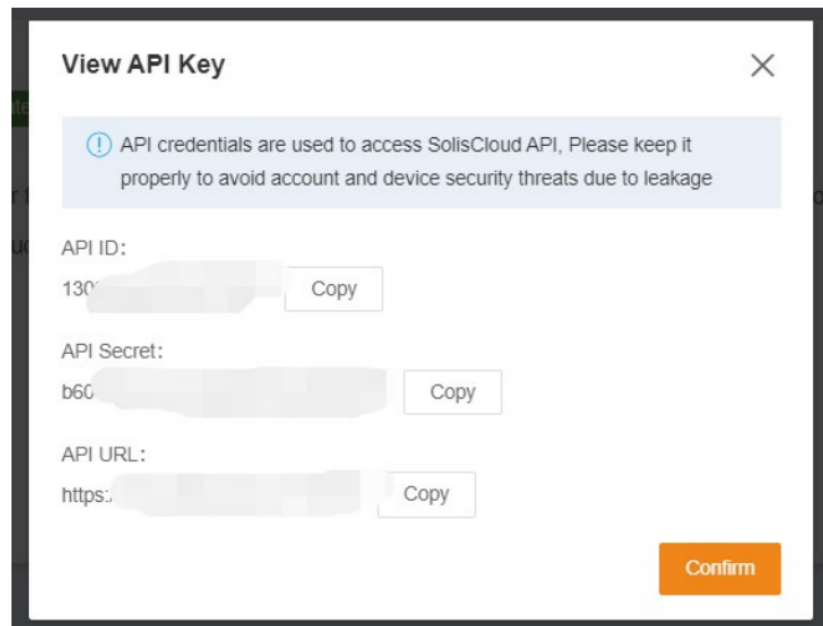
- **API ID (KeyID)** is like a username and is different for every customer.
- **API Secret (KeySecret)** is like a password and is different for every customer.
- **API URL** is used on the customer end to make the API call and is the same for every customer.
- Customer can then use the API Key, KeySecret, and URL to make API calls for systems that have been registered to their SolisCloud account. These items are used in the authorization step.
    - Note: if the customer has no plants registered to their SolisCloud account, they will not be able to make API calls
    - The customer must do the backend programming to display the data on their own platform, Solis does not do this. This is known as platform integration and is something that big customers tend to ask about. We can do it, but it will take a business deal and is not something Solis provides as a free service.

Figure 1.1

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Section B. Solis API Monitoring Document

- Once the customer signs the API form, they can be given the Solis API Document.
- This document explains what information can be obtained through API calls and how to make those calls through coding. The document will only make sense to those who understand coding.
- The message transmission format is JSON and all interfaces involved use HTTP POST method. If you use Java, please try to run Authorization.java
- Sections 1.4-2.2 of the document explain how to complete the authorization.
- Section 2.3 contains a link to an example of the authorization for Java.
- Section 3 is the API interface and makes up most of the document. This section explains how to make API calls. Each time a call is made, a response is provided. A response of zero (0) means the call was successful and a response of one (1) is unsuccessful.
    - Note: currently, only site IDs are visible through API, the site names are not. Site names will be made available in the future.
- Section 4 is the appendix which explains the status codes.

Section C. API Calling

- Using the Solis API Document, customers will make API calls with the pull method to request specific information from their plants. This information is not sent automatically by Solis, there must be a request made to obtain the data.
- The customer will typically have their own monitoring platform already set up. They can pull the data they need into their platform from SolisCloud by making API calls.
- Calling frequency is limited to three times every five seconds. If this limit is exceeded, a timeout error will be given, and the API will be blocked for five seconds. After that, calling can resume once again.
- Note: the platform can be overloaded by API calling requests. Should the timeout error occur even when staying within the three times per five seconds window, reduce the frequency of calls to two or even one time per five seconds. Solis is actively working to increase the amount of traffic the API can handle.

Section D. Solis API Frequently Asked Questions

1. Can systems be controlled and configured through API?
    a. Yes, there will be a second iteration of this document that explains this process in detail. A specific request for API control must be issued to Solis along with the API control form to be signed. After that, the API control document (separate document from API monitoring) can be provided.
2. What information is not visible through API sharing?
    a. The plant name is not visible, only the plant ID number. The inverter protection settings and grid standard parameters (e.g. voltage trip settings) are not visible. Lastly, historical data is not visible.
3. Does Solis API support push method?
    a. No, only the pull method is available currently for the public.
    b. For push method, deep platform integration work must be done by Solis and the third-party. This requires a lot of R&D resources to complete.
4. Is there a maximum number of requests in Pull API per account per day?
    a. Not per day but the limit is three times every five seconds. If this limit is exceeded, an error message will be shown, and API calling will be blocked for five seconds. API calling can continue after five seconds.
5. Can we connect to the inverter remotely to gather real-time diagnostics?
    a. The inverters can be monitored remotely through SolisCloud and API. However, the information is not in real-time, it comes in five-minute intervals. It unfortunately cannot be increased to one-minute intervals.

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       There is a lot of data available such as voltages, current, frequency, alarms, etc. all available through API. This data becomes invaluable when doing diagnostics and troubleshooting.

6. What kind of configuration of the inverter can we do remotely via API?
    a. As of now, systems cannot be fully commissioned through API. Most of the settings can be configured, but not all of them. We are working to make it so all settings can be configured, this is expected Q3 2023.
7. Is there a hierarchy of accounts that allow us to have sub-accounts (parent account with child accounts for each individual sub-contractor)?
    a. Yes, the Director of the account can create sub-accounts for installers. This is all done through the Installer Management menu but must be done by whoever is registered as the Director.
8. Can we see inverter-level data for each inverter of a multi-inverter solar project?
    a. Yes, the data for each inverter is visible separately.
9. Can we see electrical details for each PV module, PV string, MPPT, inverter, or system?
    a. Details can be seen for PV string, MPPT, inverter, and system. Solis does support a few MLPE brands that can provide module-level data. If that MLPE is being used, then module-level data will also be available.
10. Can we see inverter error messages?
    a. Yes, alarm messages are stored on SolisCloud and can be pulled through API.
11. How far back is the data preserved?
    a. At this time, all of the data is preserved and none is deleted. In the near future, only one year of data will be saved. It will be possible for the data to be sent to the customer for storage if they request it.
12. What is the sample frequency of data, e.g. intervals in which new data is available?
    a. The sample frequency is five minutes, and this cannot be changed to one minute.
13. What is the time period between inverter captures the data and its availability through API?
    a. There is a five minute gap, since data is being sent once every five minutes. This means the data being seen is five minutes old.
14. Is there any historical data recalculations? Under which conditions will they happen?
    a. There are some instances where historical data is recalculated. The most common instance is when the plant overview data does not match the device-level data. For example, when a system has a slow internet connection speed, some data may not make it to SolisCloud. When this happens, the plant overview data will not match the device data.
    b. A request can be made to Solis to have the data recalculated. Solis is adding a button on SolisCloud which allows the customer to recalculate their data without having to submit a request (Q3 2023).
15. What has to be done on the third-party (customer) side in order to start platform integration?
    a. For the pull method, the steps are outlined in Section A. For the push method, a business discussion will need to be had first.
16. Is a service account/token created or how is API access achieved?
    a. Please see Section A for the steps on achieving API access.
17. Is there a test/sandbox account that can be used to test API sharing in case I have no registered PV plants on SolisCloud?
    a. Yes, there is a sandbox account available. This can be provided upon request.
18. How long does it take to move from test to production environment?
    a. In order to have data from an actual site, a plant would need to be registered under the account that is doing the API calling. We are working to add a guest function where API calling can be done for a plant registered to another account (Q3 2023). If the customer has plants already registered on SolisCloud and they are currently using the sandbox system only, they can see their plants through API once API access has been opened and the three API items obtained (API ID, API Secret, API URL).