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Welcome to the **Smithtek.Cloud** IoT platform, your gateway to efficient device management in the IoT space.

Our platform is designed to communicate directly with the **PassPort Gateway**, providing a robust solution for bridging sensor data from physical devices to the cloud. The PassPort Gateway leverages **Node-RED** as its interface, enabling you to effortlessly connect and manage devices that are either hardwired or connected via **LoRa RF**.

With dedicated **Node-RED** nodes tailored specifically for Smithtek.Cloud, setting up your connections is both quick and straightforward. These nodes not only facilitate the sending of data to the cloud but also empower you to receive commands from the cloud, allowing for real-time control of devices, such as turning them on or off.

In this guide, we will walk you through the essential steps to get your devices connected and operational on the Smithtek.Cloud platform using the PassPort Gateway. Whether you are dealing with local sensor data or remotely connected devices, our system is designed to provide you with an efficient and effective IoT experience.

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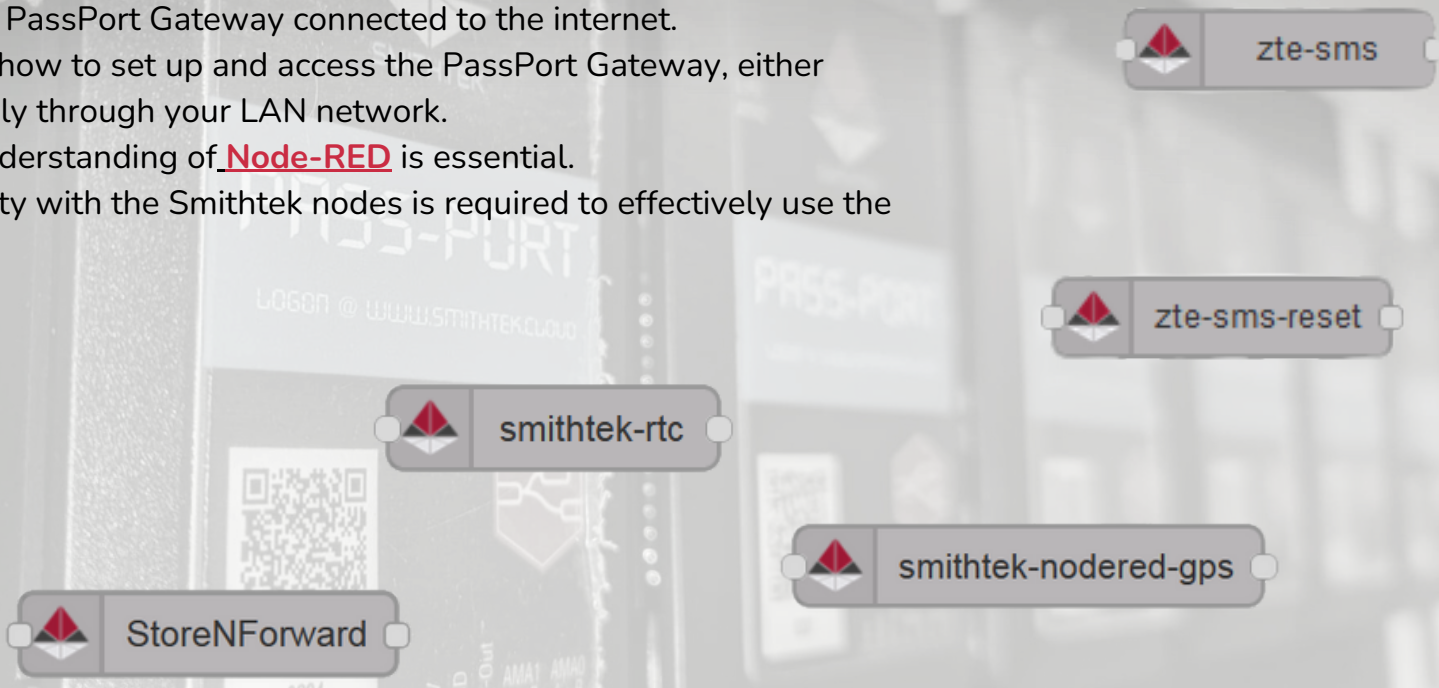
Prerequisites:

To effectively utilise the Smithtek.Cloud platform, it's important to have a few foundational elements in place. These prerequisites ensure that you are equipped with the necessary tools and knowledge to seamlessly integrate your devices and manage them efficiently. Here's what you will need:

- **Smithtek.Cloud Account:** You must have a valid Smithtek.Cloud account with at least one active plan.
- **PassPort Gateway:** Ensure you have a PassPort Gateway connected to the internet.
- **Access Knowledge:** You should know how to set up and access the PassPort Gateway, either directly from its access point or remotely through your LAN network.
- **Node-RED Understanding:** A basic understanding of Node-RED is essential.
- **Smithtek Nodes Knowledge:** Familiarity with the Smithtek nodes is required to effectively use the platform.



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Communication Rules:

When sending and receiving data through the Smithtek.Cloud platform, it's crucial to follow a few rules to ensure the telemetry interface remains stable and reliable. Here are the key points to keep in mind:

- **Data Format:** All data must be in JSON format. Most nodes in Node-RED will automatically convert your sensor data to JSON.
- **Numerical Data Only:** The cloud only accepts numerical data. It does not accept boolean values (true/false) or strings (text), although you can send string text in the context object.
- **Transmission Frequency:** Data must not be sent more frequently than 4 Hz. However, be mindful of your monthly data allowance to avoid exceeding it.
- **Monthly Data Allowance:** Each plan allows for 1 million transmissions per month, divided across 20 variables.
- **Valid API Label and Token:** Ensure that you are using a valid API label name and token when sending data to the cloud.

By adhering to these guidelines, you will help maintain the reliability and efficiency of your IoT data transmissions within the Smithtek.Cloud platform.

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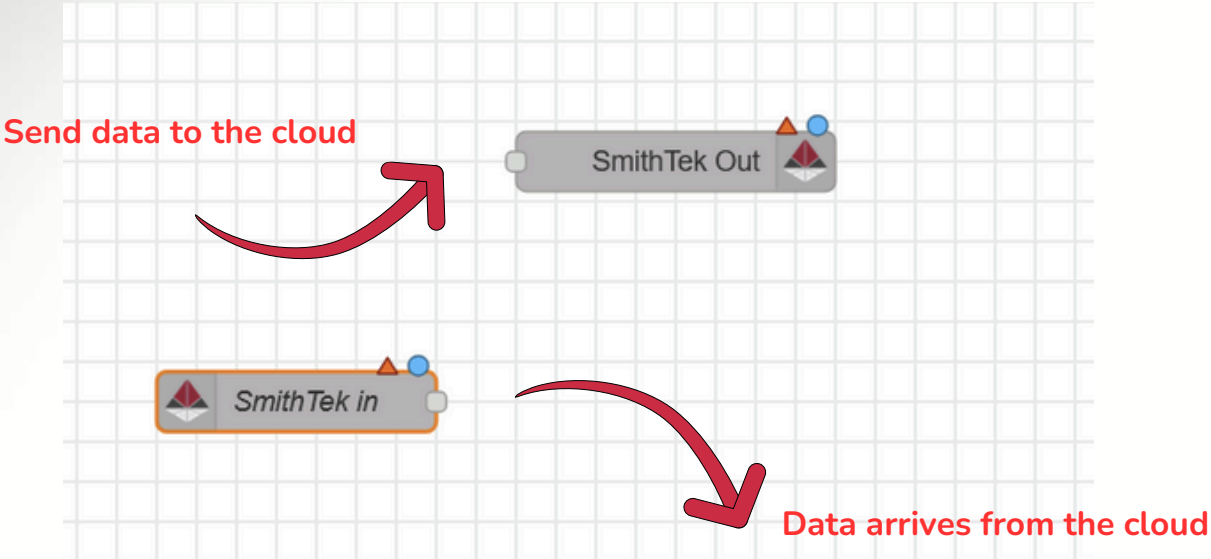
Node-RED The Connector Nodes:

In Node-RED, there are two specialised nodes designed to connect directly with Smithtek.Cloud, making it easy to manage your IoT devices and data flow.

- **Smithtek Out Node:** This node allows you to send data from your Node-RED environment to the Smithtek.Cloud platform. You can wire any relevant data to this node, which will then be transmitted to the cloud for further processing or storage.
- **Smithtek In Node:** This node enables you to receive data from Smithtek.cloud into your Node-RED environment. Once the data is in Node-RED, you can wire it to other connected devices or systems, allowing you to set setpoints, turn devices on or off, reset systems, and more. This provides you with robust control over your IoT ecosystem, directly from within Node-RED.



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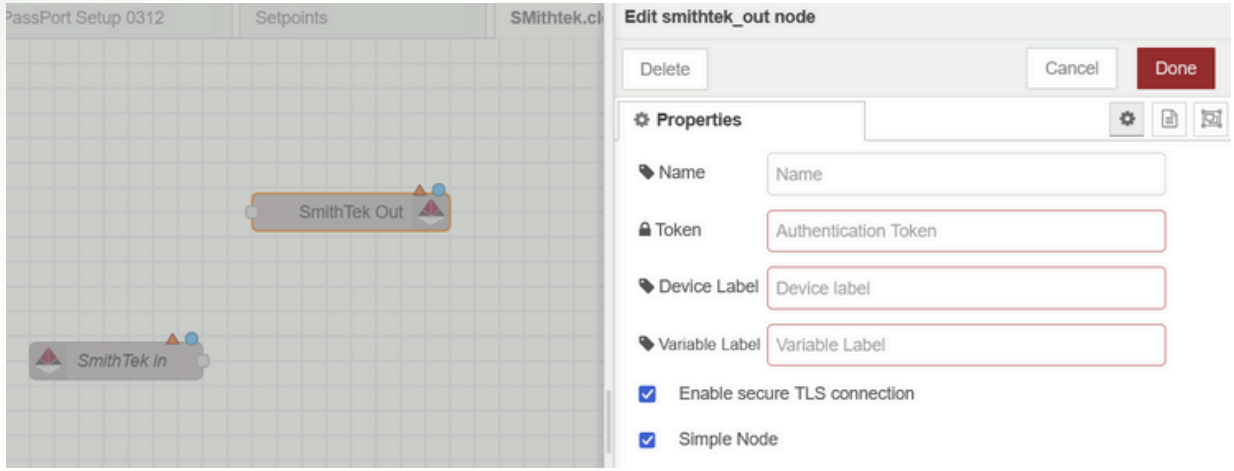
Node-RED Settings:

When setting up the ‘Smithtek In’ and ‘Smithtek Out’ nodes in Node-RED, there are a few basic settings you need to configure to ensure they connect properly to the Smithtek.Cloud platform. Both nodes share almost identical settings, which makes the setup process straightforward. Here’s a breakdown of these key settings:

- **API Label:** This represents the name of your device in the cloud. All data sent or received will be associated with this device name, so it’s crucial to use the correct label.
- **Token:** This is a long, unique string of characters that acts as a security key for your device. It should be copied from the Smithtek.Cloud platform and pasted into the node settings. Tokens are secret and should never be shared.
- **Variable Label:** This is an optional setting if you’re using the simple node mode. It allows you to specify a label for the variable you’re working with.
- **TLS Encryption:** This option enables TLS (Transport Layer Security) for secure communications between your nodes and the cloud. Activating TLS does not affect the efficiency of your communications, but it adds an extra layer of security.

By configuring these basic settings correctly, you ensure that your Smithtek nodes can reliably connect and communicate with the Smithtek.Cloud platform.



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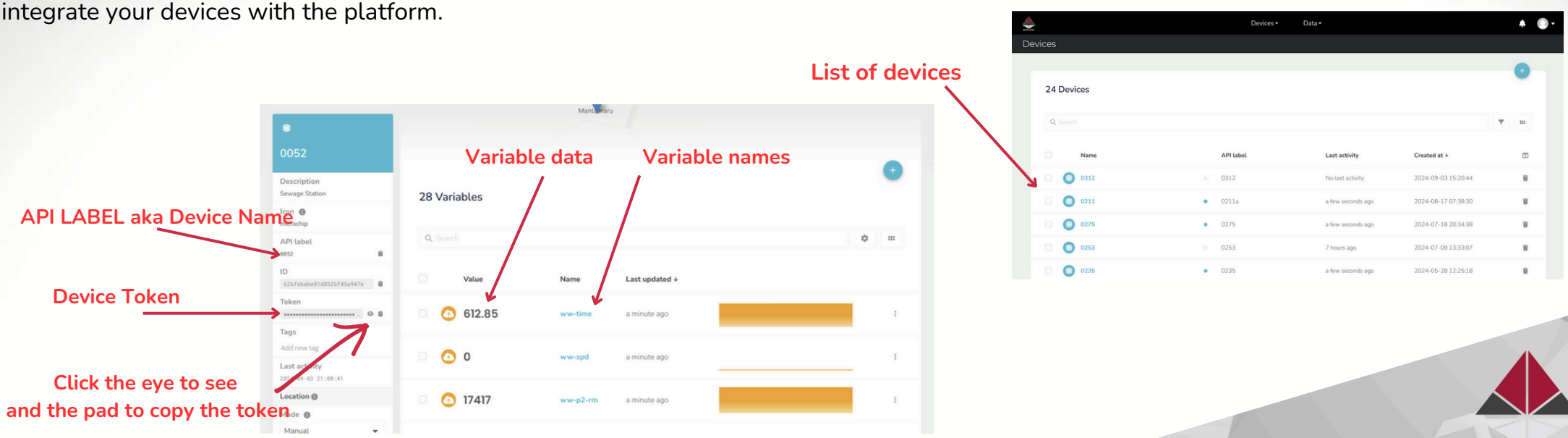
Smithtek.Cloud - Basic Layout:

Smithtek.Cloud is designed with simplicity in mind, making it easy to navigate and manage your IoT devices. Here's how to access and configure your devices within the platform:

- **Accessing the Devices Page:** Once you log in to Smithtek.Cloud, locate and click on the 'Devices' option at the top center of the website's homepage. This will take you to a list of all your connected devices.
- **Identifying Your Device:** Your devices are listed by their 4 or 5-digit serial numbers, which can be found on the front of your PassPort Gateway next to the QR code. Find and click on the serial number corresponding to the device you want to manage.
- **Accessing API and Token:** After clicking on your device, you will be taken to its detailed settings page. On the left-hand side of this page, you will find crucial information, including your device's API label and token. These are essential for connecting your device to the cloud and should be kept secure.

By following these steps, you can easily navigate Smithtek.Cloud, access your device settings, and obtain the necessary information to integrate your devices with the platform.



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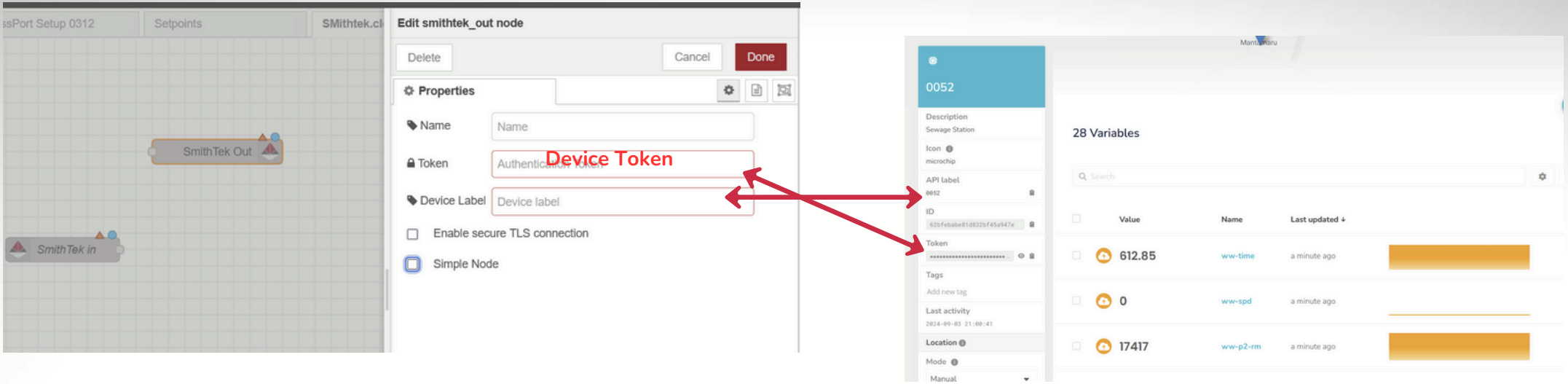
Credentials Node-RED / Smithtek.Cloud:

To get started, open both your Node-RED interface and the Smithtek.Cloud platform. In Smithtek.Cloud, navigate to your device settings and locate the API label and token. Copy these credentials from Smithtek.Cloud and paste them into the respective fields in both the ‘Smithtek In’ and ‘Smithtek Out’ nodes in Node-RED. This ensures that your nodes are correctly authenticated and able to communicate with the cloud.



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Smithtek.Cloud - Setting Up Data Points

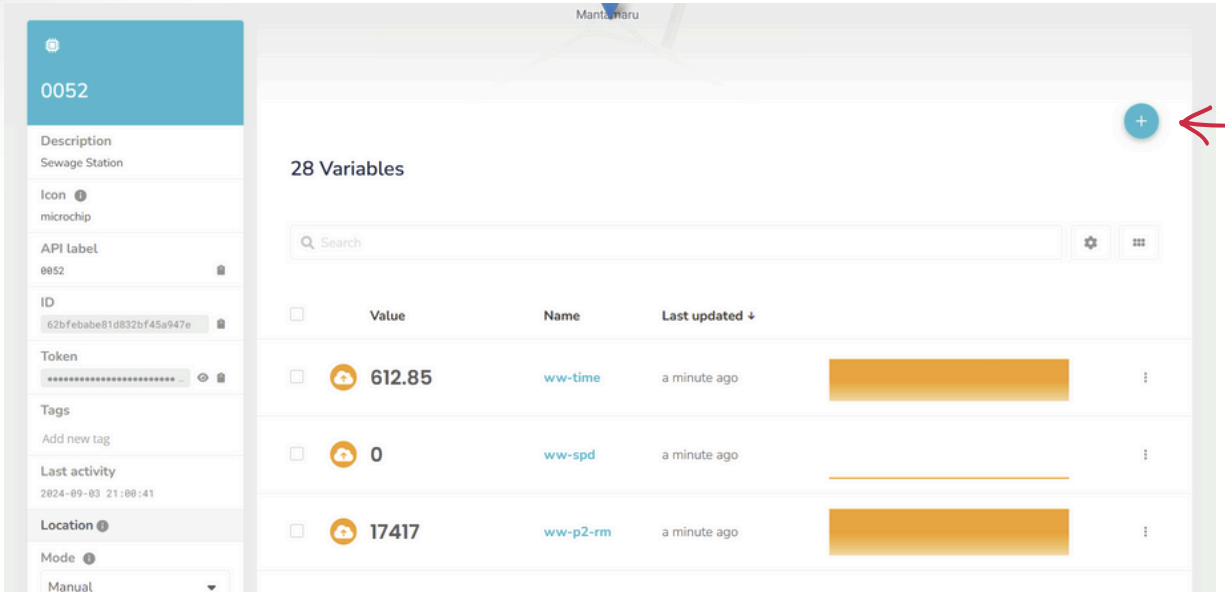
In Smithtek.Cloud, a variable represents any data sent between the PassPort Gateway and the cloud, such as sensor readings (voltage, temperature) or control data (on/off, setpoints). Each data point counts as one variable. For example, monitoring voltage, current, temperature, RPM, alarms, and start/stop on a generator equals six variables.

Setting Up Variables

You can add variables in two ways:

1. **Manually:** Click the blue + button on the device page to create specific variables for monitoring or control.
2. **Automatically:** The Smithtek Out node in Node-RED can create variables automatically. When data is first sent, the cloud generates matching variables, simply refresh the page to view them.

For control variables (commands from cloud to PassPort), you must add these manually using the blue + button before sending control signals.



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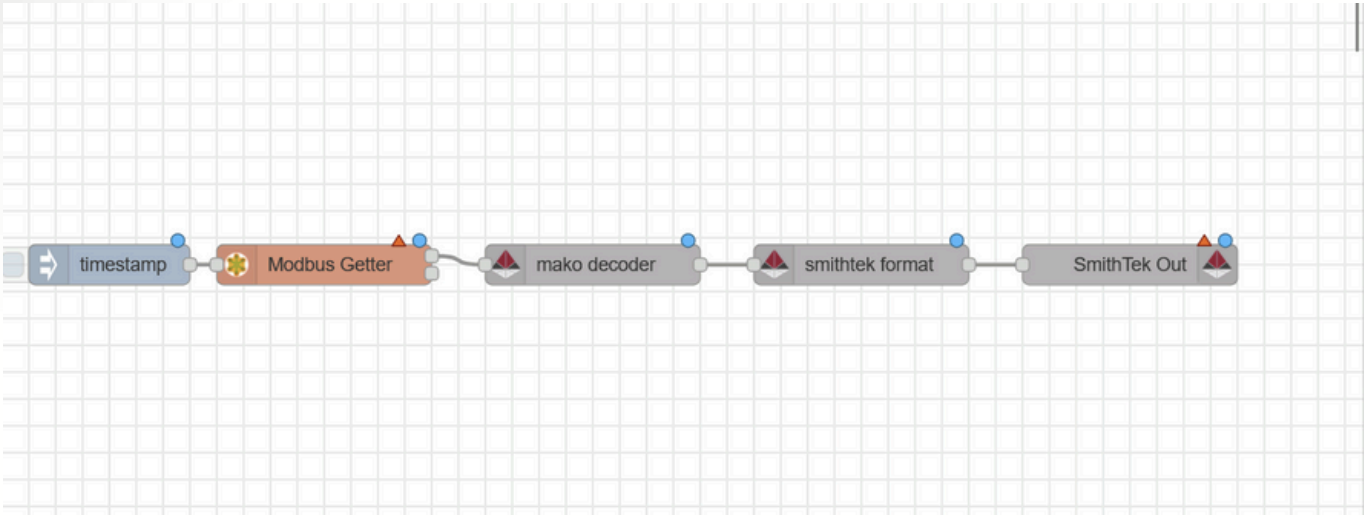
PassPort Node-RED - Sending Data to the Cloud

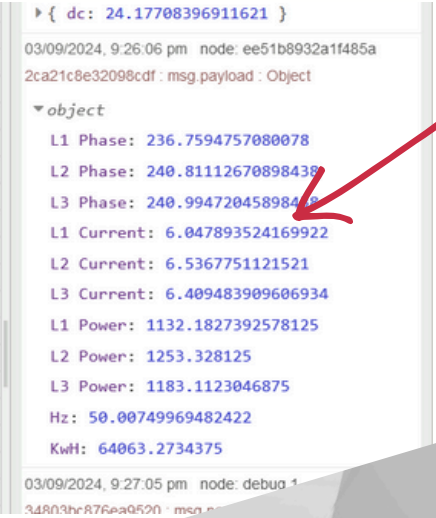
To send data from Node-RED to Smithtek.Cloud, follow the correct node sequence and setup. Full guides and data sheets are available on our Support page. Here's how to properly send data from Node-RED to Smithtek.cloud:

Use Pre-Made Nodes: Smithtek provides pre-made nodes that simplify the process, provided you use them in the correct order.
Modbus Communication: In most cases, the PassPort will use Modbus to communicate with third-party devices like Mako PLCs, environmental sensors, or generator sets. This includes communication over long distances via LoRa antennas.
Node Sequence for Data Transmission:

- **Modbus Getter Node:** This is the first node you will use. It reads data from the connected devices using the Modbus protocol.
- **Mako Decoder Node:** After retrieving data with the Modbus Getter, pass it through the Mako Decoder node. This node converts the Modbus data into the appropriate JSON payload needed for cloud transmission.
- **Format Node:** The final step is to use the Format node. This node ensures that the data is correctly formatted, only includes numerical values, and applies a timestamp and GPS coordinates (if your setup includes them).

Smithtek's pre-made nodes handle most of the setup automatically, just use them in this order to ensure accurate, reliable cloud transmission.





Your payload should look like this when sending to the cloud.

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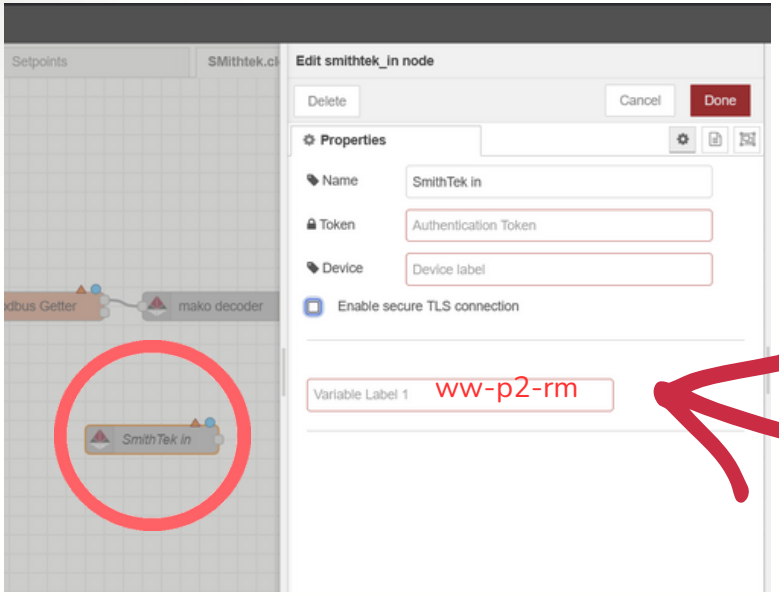
PassPort Node-RED - Sending Data to the PassPort

When sending data from Smithtek.Cloud to Node-RED, remember that the Smithtek In node can only subscribe to one variable at a time.

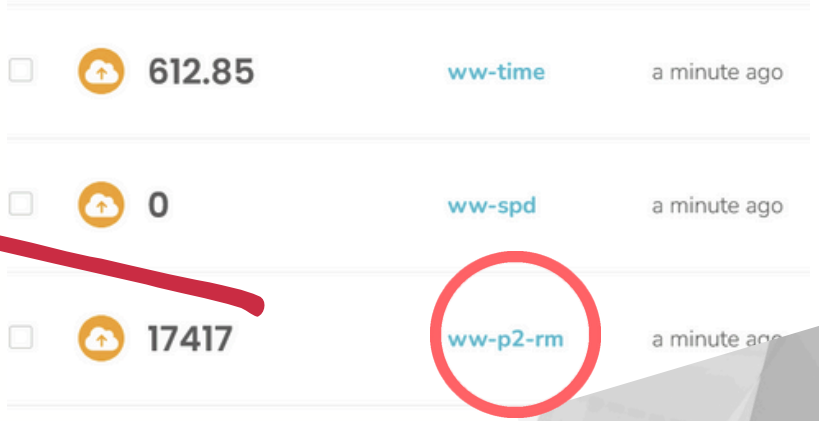
Setup Steps:

1. **One Variable per Node:** Each Smithtek In node handles a single variable. To control multiple devices or parameters, add multiple nodes, one for each variable.
2. **Assign Variable Name:** Copy the variable name from your device's Variables page on Smithtek.Cloud and paste it into the Variable Name field in the Smithtek In node.
3. **Use Same API Label & Token:** You can reuse the same API label and token as the Smithtek Out node to keep all nodes linked to the same device.

By assigning unique variable names and sharing the same API credentials, you can reliably control multiple devices or parameters from the cloud within your Node-RED flow.



The payload from the Smithtek in node is just a value, there is no other data, it can be wired directly to the Modbus nodes or other nodes within the flow.



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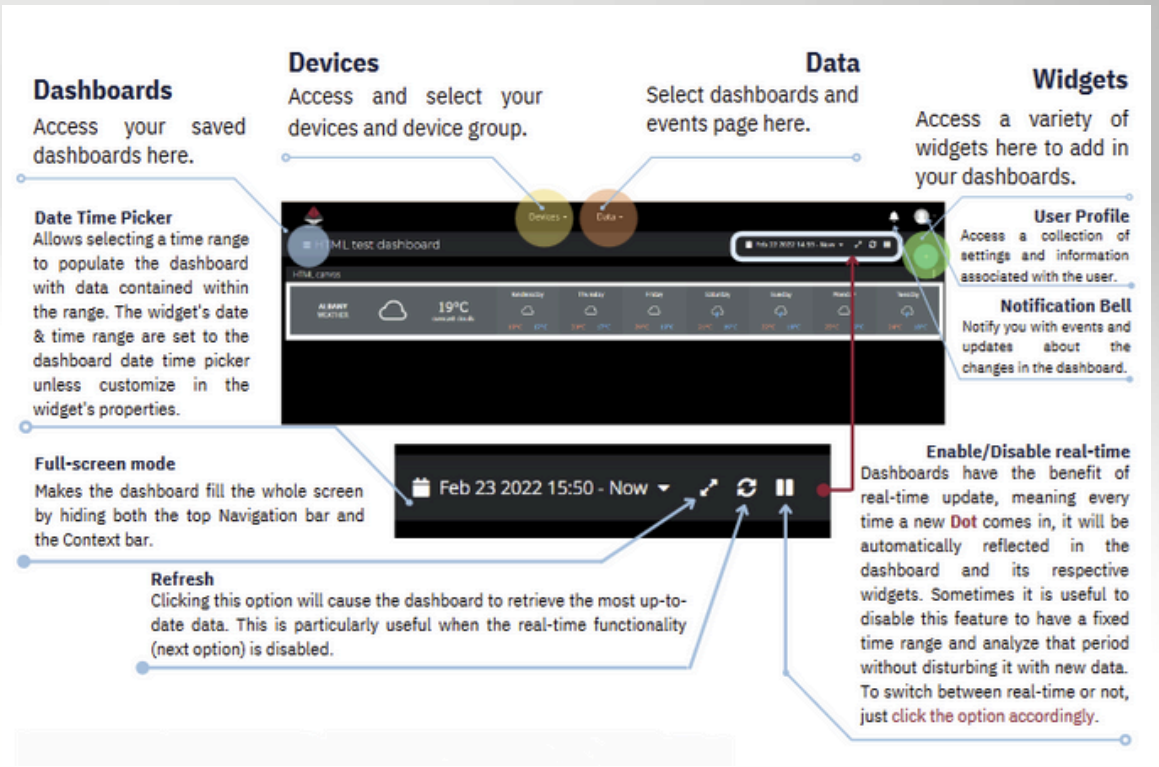
Smithtek.Cloud - Building Your Dashboard

To visualise and interact with your IoT data, you can create a custom dashboard in Smithtek.Cloud. Follow these steps to set up your dashboard:

Access the Dashboard Section: At the top of any webpage in Smithtek.Cloud, locate the 'Data' tab in the center. Click on it, and then select 'Dashboards' from the dropdown menu.
Open the Dashboard Menu: On the left-hand side of the page, just below the Smithtek logo, you'll see three horizontal lines. Click on these lines to open the dashboard menu.
Create a New Dashboard: In the dashboard menu, you'll see an option to 'Create Dashboard'. Click on this to start building your new dashboard.
Add Widgets: Once your dashboard is created, you can begin adding widgets. Widgets are the interactive elements of your dashboard that display data, such as graphs, charts, or control buttons.
Assign Variable Data: After adding widgets, assign the appropriate variable data to them. This allows you to interact with the data in real-time, whether it's viewing sensor readings or controlling devices.



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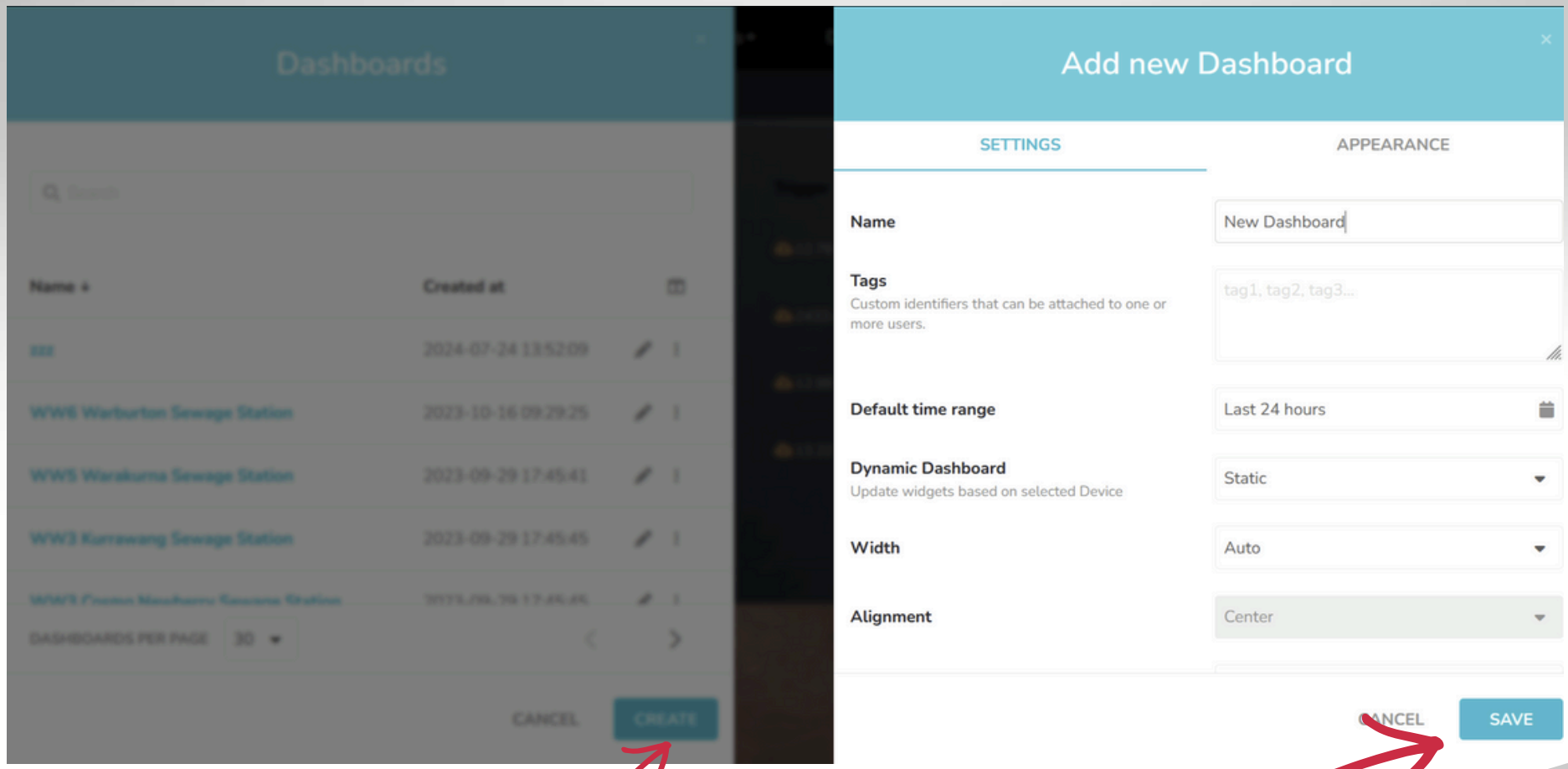
Smithtek.Cloud - Building Your Dashboard

When you create a dashboard, there are some basic properties you can complete first. In most cases, apart from the name, the default settings are adequate.



Create here

Save here

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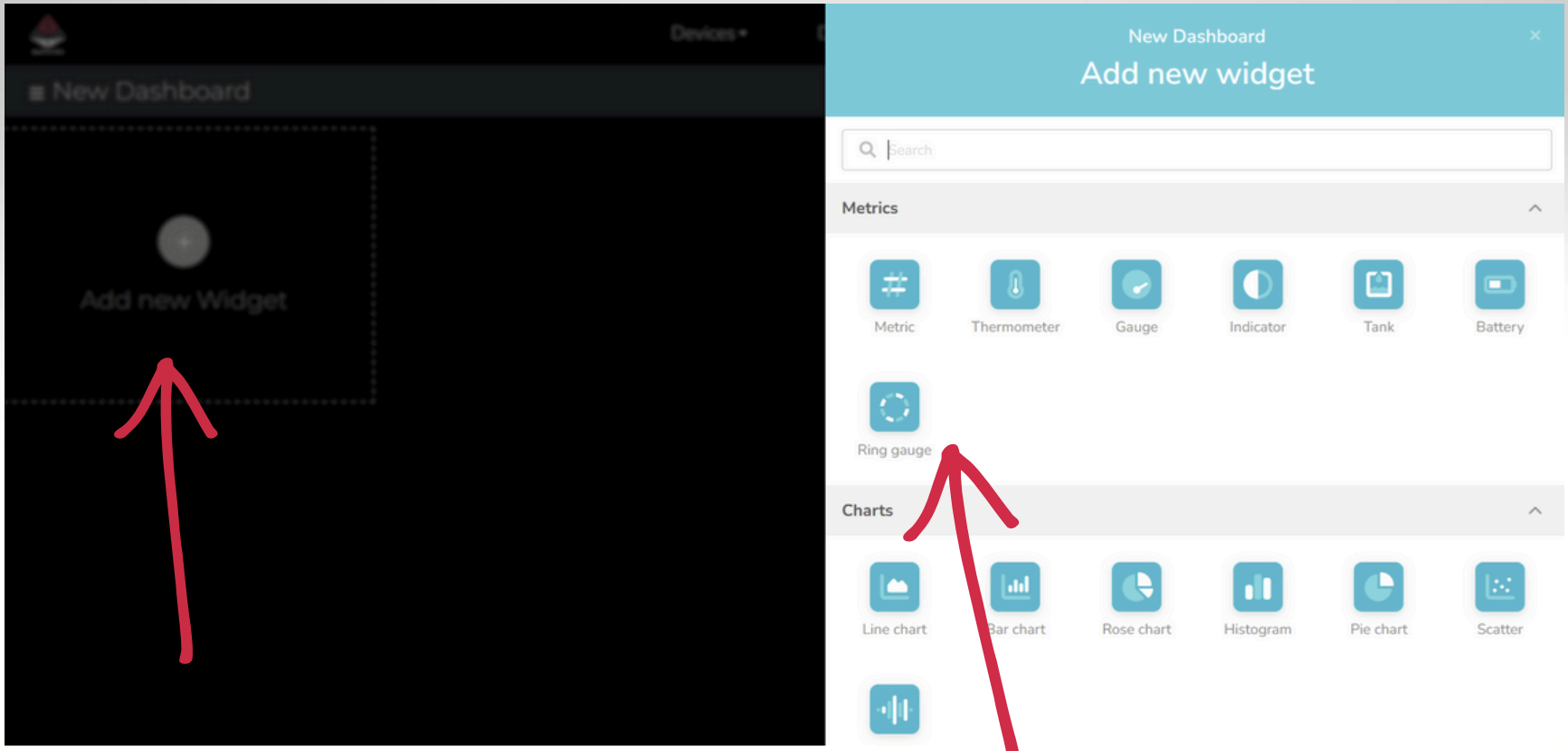
Smithtek.Cloud - Selecting Widgets

To add a widget, click the ‘Add Widget’ icon on your newly created dashboard. A new window will pop up, displaying a variety of widget options. You can choose from several types, including line charts, control buttons, sliders, and gauges, depending on how you want to visualise or interact with your data.



Add a widget here

Select widget here

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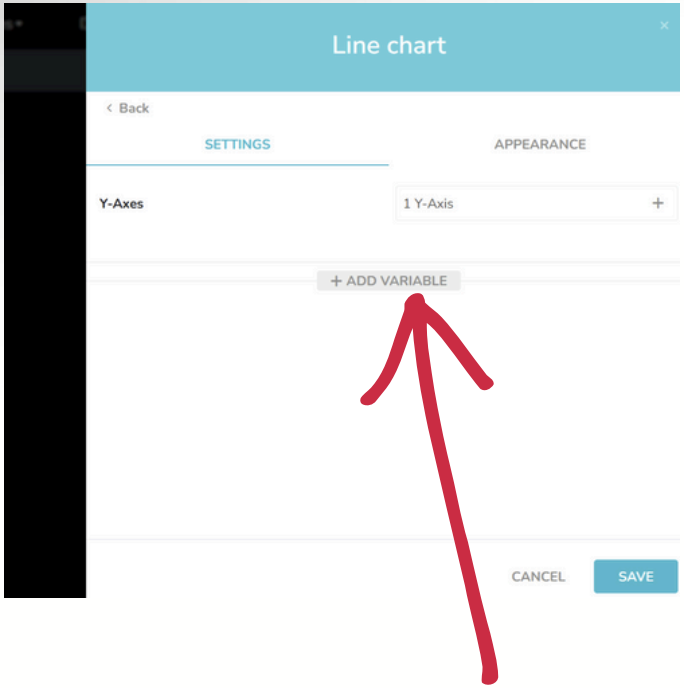
Smithtek.Cloud - Selecting Variables

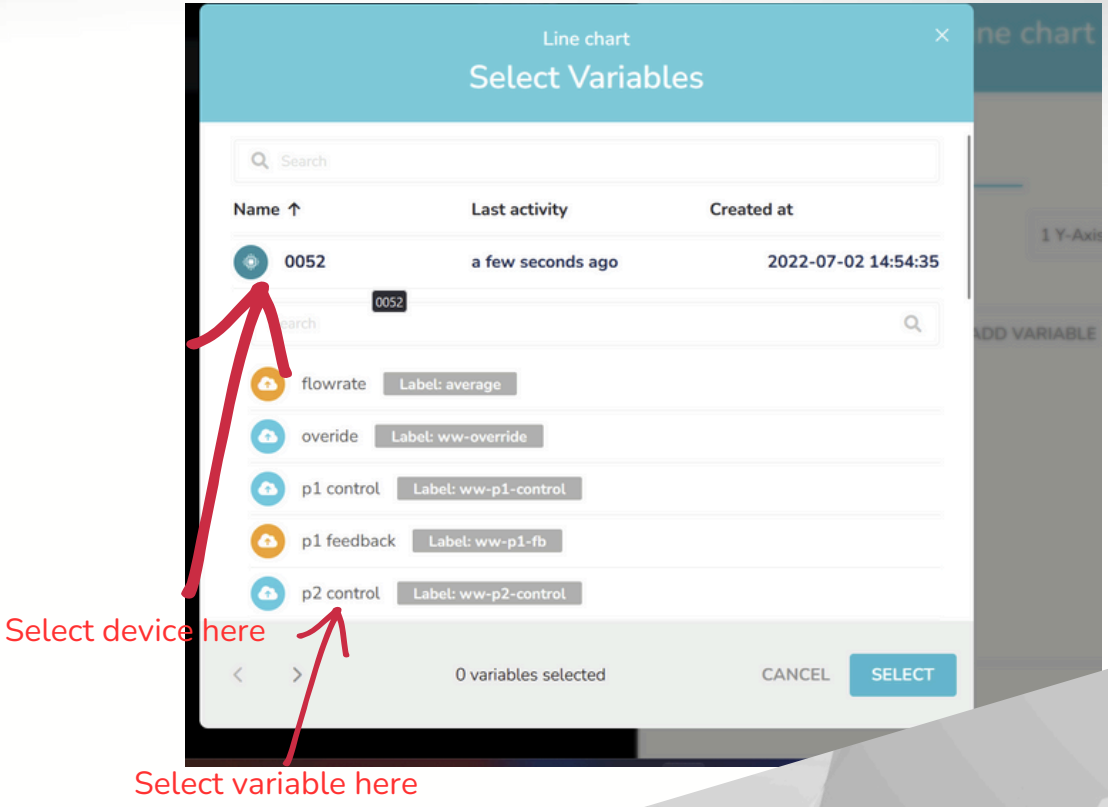
After selecting your widgets, you will notice a common phrase on each one that prompts you to ‘Add Variable’ with a plus symbol. This is where you link your widget to the specific data point (or variable) you want to display or control.

To do this:

- Click on the ‘Add Variable’ option.
- Locate your device from the list that appears and click on it.
- Then, find and select the appropriate variable for that widget.
- Once selected, click ‘Save’.

Your widget will now display the data and will react in real time as new data arrives.





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Smithtek.Cloud - Data Transmissions

How you use your 1 million transmissions across your 20 variables is entirely up to you.

Single Sensor Variable: If you have a single sensor, like a temperature sensor, and require high-frequency updates, you could update 23 times a minute (see Row 1 in the table below).
Multiple Variables: If you need maximum remote monitoring for multiple variables, such as a pump skid with 20 variables, you can update each one once every minute. Additionally, there is a surplus capacity available for remote control back to your asset (see Row 20 in the table below).

Regardless of how you use your plan, the 20 variables and 1 million transmissions are always available for you to manage as needed.

Number of Data Points	Updates Per Month per Variable	Updates Per Day per Variable	Updates Per Hour per Variable	Updates Per Minute per Variable	Surplus Updates Per Hour per Variable
1	1,000,000	33,333	1,389	23	1,329
2	500,000	16,667	694	12	634
3	333,333	11,111	463	8	403
4	250,000	8,333	347	6	287
5	200,000	6,667	278	5	218
6	166,667	5,556	231	4	171
7	142,857	4,762	198	3	138
8	125,000	4,167	174	3	114
9	111,111	3,704	154	3	94
10	100,000	3,333	139	2	79
11	90,909	3,030	126	2	66
12	83,333	2,778	116	2	56
13	76,923	2,564	107	2	47
14	71,429	2,381	99	2	39
15	66,667	2,222	93	2	33
16	62,500	2,083	87	1	27
17	58,824	1,961	82	1	22
18	55,556	1,852	77	1	17
19	52,632	1,754	73	1	13
20	50,000	1,667	69	1	9

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Smithtek.Cloud - Tips & Tricks

Here are some important tips and tricks to ensure your Smithtek.Cloud setup runs smoothly:

API Labels: Always double-check that your API labels are correct. Use only lowercase letters and avoid spaces by using the - symbol. For example, use ‘device-name’. The same rule applies to variables.
Node Formatting: If you are using the ‘Mako Decoder’ node or the ‘Buffer Parse’ node, you can write in lowercase and include spaces between words. The Formatter node will handle the format correctly.
Transmission Frequency: Be mindful of how often you transmit data. For example, a Smithtek 210 subscription allows you to transmit all 20 variables every minute indefinitely. Use the chart on the next page to help understand your usage.
Internet Connection: Ensure you have a reliable internet connection and test it before deployment. Check that firewalls do not block transmissions.
MQTT Protocol: Smithtek.cloud uses MQTT, so every time the PassPort Node-RED flow is redeployed, or the PassPort is restarted, it will re-subscribe to the last value. Make sure to handle this properly for control commands.
Control Commands: The best practice for control commands is to create a variable named ‘override’ or ‘arm’ that must be triggered first before any other commands can be sent to the PassPort. Smithtek has a dedicated template for this; feel free to reach out for a copy.
Data Format: Always use numbers in your transmissions; boolean values (true/false) won't work.

By keeping these tips in mind, you will avoid common pitfalls and ensure your Smithtek.Cloud integration works efficiently.

You can also click here to complete the Node-RED courses, online for FREE if Node-RED is unfamiliar to you.

Node-RED