

Moonbase Sequence Creation Guide For Interns

Before you start reading how to create a sequence, it is recommended that you read the Moonbase terminology page on this website to gain a better understanding of the platform as a whole.

First, it is **incredibly important** to note that if you do not provide a sequence with a trigger, action, and vin you will not be able to view it in the sequence list, so make sure that you complete your sequence before submitting it! Secondly, if you are interested in the backend format of all the triggers and actions, you should take a look at the trigger and action json page on this website.

Now that you are all caught up, let us dive into the sequence creating process. To make a sequence, navigate to the [Sequence Creation page](#) on Moonbase Web. There you will see a layout similar to what you see in Figure 1.

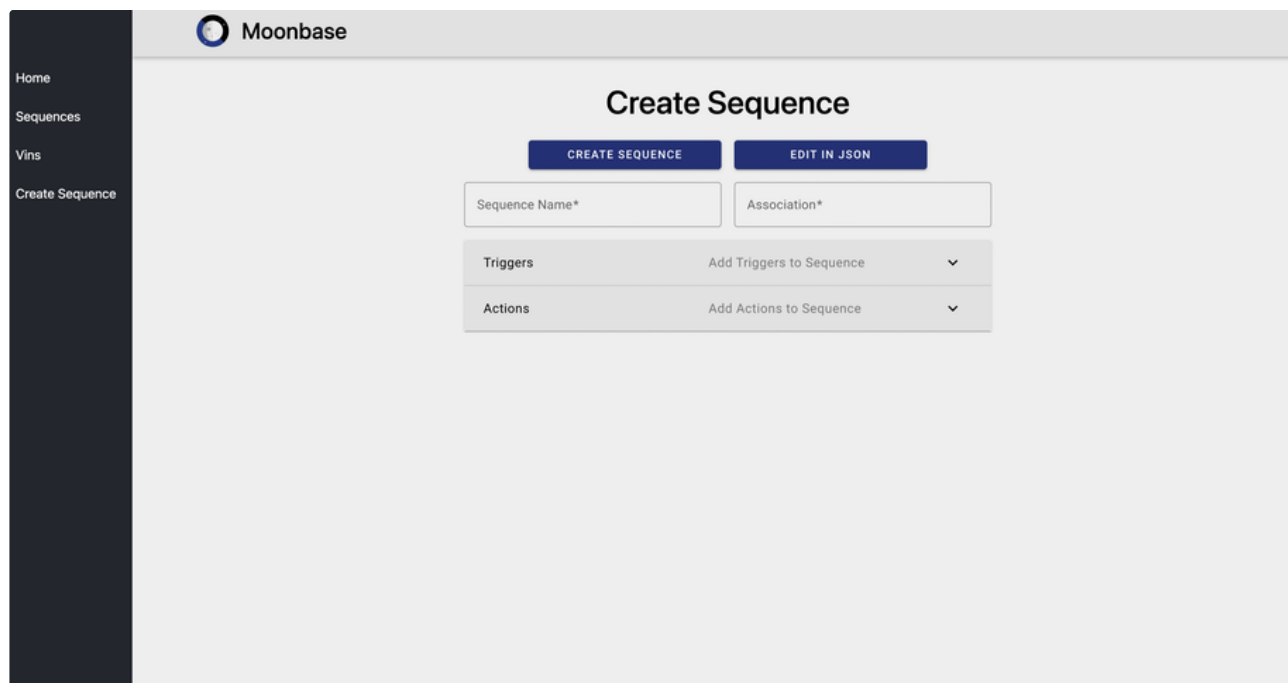


Figure 1. Create Sequence Page

Despite what Figure 1 shows, you will only be able to fill in the sequence name. The association is newly improved so that it is autofilled with your first and last name when you sign in. You can change your association in the "Edit In JSON" button, but it is highly recommended that you leave it alone or else your sequence might not appear on the view sequence page. The sequence name is a bit more obvious in functionality. Choose whatever name you want when naming your sequence. Duplicated names, bad practice aside, are not an issue as each created sequence is auto-assigned a unique ID upon creation.

Trigger - Time

Go ahead and fill out the sequence name and association fields. Then select the triggers drop down box. You can select a variety of triggers for your sequence and we will go through each one in this guide. The first trigger is time and will look like the example in Figure 2.

The screenshot shows the 'Create Sequence' interface in the Moonbase application. On the left is a dark sidebar with navigation links: Home, Sequences, Vins, and Create Sequence. The main content area has a header with the Moonbase logo and title. Below the title are two buttons: 'CREATE SEQUENCE' and 'EDIT IN JSON'. The form includes two input fields: 'Sequence Name*' with the value 'example sequence' and 'Association*' with the value 'test@example.com'. A section titled 'Triggers' is expanded, showing tabs for 'TIME', 'WEATHER', 'ZONEMAPPER', and 'ADA SENSOR(S)'. The 'TIME' tab is active, displaying a 'Cron Expression' box with the text 'min hr day month week' and an 'ADD TRIGGER' button. Below this is an 'Actions' section with an 'Add Actions to Sequence' button.

Figure 2. Time Trigger

A time trigger is indicated by a cron expression. To have your sequence be triggered by time, you can replace the min, hr, day, month, and day of the week fields in the cron expression box with the time you want your sequence to occur. To get a better understanding of the values you can add, take a look at this [page on cron](#) or you can click the link under the cron expression box. Click the “add trigger” button at the bottom of the box when you have finished setting up your cron value. Next we will move on to weather triggers.

Trigger - Weather

If you wanted to create a sequence where your vehicle performs an action based on the weather, the weather trigger is right for you. Clicking on the weather tab will display a box like the one in Figure 3.

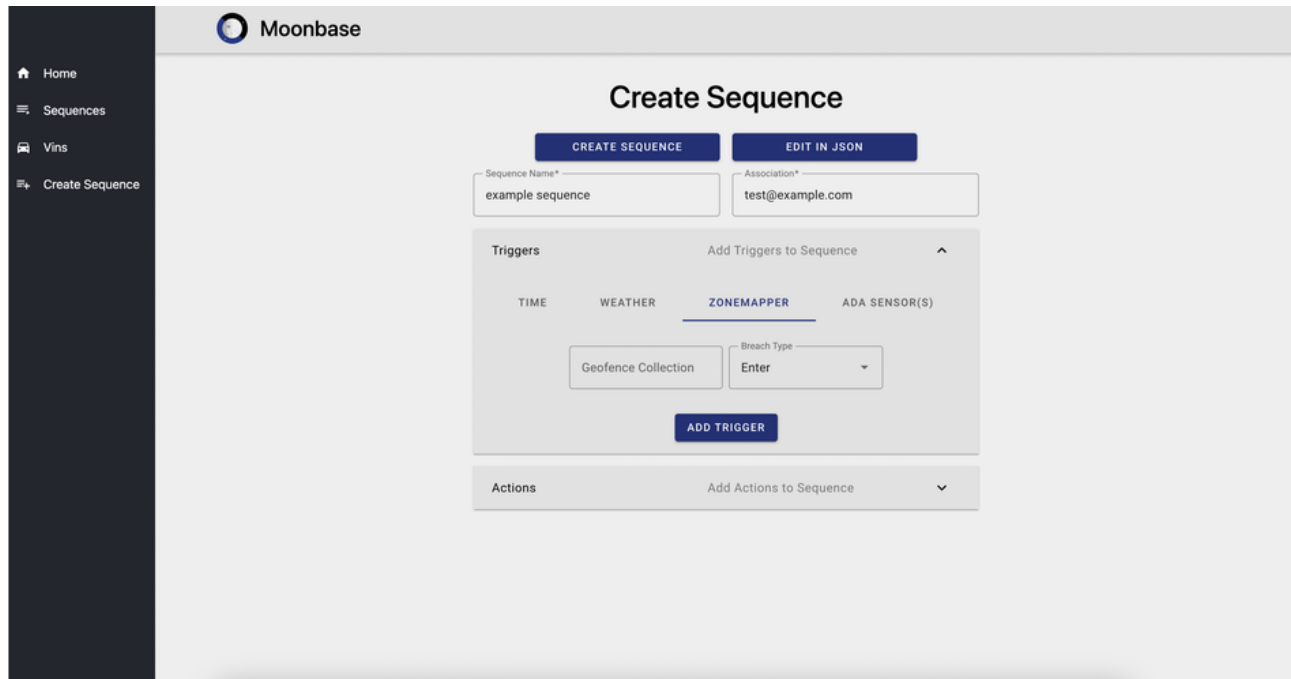
This screenshot shows the 'Create Sequence' form with the 'WEATHER' tab selected under the 'Triggers' section. The 'Sequence Name*' field contains 'example sequence' and the 'Association*' field contains 'test@example.com'. The 'Weather Type' dropdown menu is open, showing 'Precipitation' as the selected option. Below the dropdown is a grid of checkboxes for various weather conditions: Clear, Drizzle, Snow, Mist, Dust, Fog, Tornado, Squall, Sand, Smoke, Clouds, Rain, Haze, Ash, and Thunderstorm. An 'ADD TRIGGER' button is located at the bottom of the weather trigger section. The 'Actions' section at the bottom remains visible with its 'Add Actions to Sequence' button.

Figure 3. Weather Trigger

You can select as many weather options as you want here. You also have the option to base the trigger on temperature instead of weather type. There is not much more to adding a weather trigger to your sequence, so we will move on to a Zonemapper trigger.

Trigger - Zonemapper

A Zonemapper trigger is used when you want to check if a vehicle has entered or exited a zone that you have set up. The way this is done is by creating a geofence collection, which is essentially just a set of coordinates. Now this may seem intimidating, but the process is very simple and you can read exactly how to create your own geofence collection [here](#). When you select the Zonemapper trigger option, you will be brought to the page like the one in Figure 4.



The screenshot shows the Moonbase web interface for creating a sequence. On the left is a dark sidebar with navigation links: Home, Sequences, Vins, and Create Sequence. The main content area is titled 'Create Sequence' and features two buttons: 'CREATE SEQUENCE' and 'EDIT IN JSON'. Below these are two input fields: 'Sequence Name*' with the value 'example sequence' and 'Association*' with the value 'test@example.com'. The 'Triggers' section is expanded, showing tabs for TIME, WEATHER, ZONEMAPPER (which is selected), and ADA SENSOR(S). Under the ZONEMAPPER tab, there is a 'Geofence Collection' input field and a 'Breach Type' dropdown menu set to 'Enter'. An 'ADD TRIGGER' button is located below these fields. At the bottom, there is an 'Actions' section with a header 'Add Actions to Sequence' and a downward arrow.

Figure 4. Zonemapper Trigger

Once you have created your geofence collection and processed it according to the guide, you can just paste the collection into the “geofence collection” box. From there, you can determine if you want to check if the vehicle attached to your sequence has entered or exited the zone you have created. If you want to check for both, just repeat the process and change the breach type. Moving on to our final trigger, we will discuss sensors.

Trigger - Sensors

We have the ability to pull live data from all the different types of sensors in Stellantis vehicles. The ADA sensor trigger allows you to take vehicle data and use it to activate your sequence. For example, you could create a sequence that sends a text to the vehicle owner if their oil levels are low. While there are thousands of different sensor values, here is a list of some of the [commonly used sensor names](#) and what they do. Clicking on the ADA Sensors tab will show you what you can see in Figure 5.

The screenshot shows the 'Create Sequence' interface in the Moonbase application. On the left is a dark sidebar with navigation links: Home, Sequences, Vins, and Create Sequence. The main content area has a header 'Moonbase' and a title 'Create Sequence'. Below the title are two buttons: 'CREATE SEQUENCE' and 'EDIT IN JSON'. The form contains two input fields: 'Sequence Name*' with the value 'example sequence' and 'Association*' with the value 'test@example.com'. A 'Triggers' section is expanded, showing four tabs: 'TIME', 'WEATHER', 'ZONEMAPPER', and 'ADA SENSOR(S)'. The 'ADA SENSOR(S)' tab is selected, displaying a form with 'Sensor Name', 'Test Value', and 'Operator' (set to '<'). There are 'ADD SENSOR' and 'ADD TRIGGER' buttons. At the bottom, an 'Actions' section is partially visible with a dropdown for 'Add Actions to Sequence'.

Figure 5. ADA Sensor Trigger

There are now two different ways that you can add a sensor to your sequence. You can either select one from the drop down box or you can edit the sequence in a JSON and write whatever sensor you want from commonly used sensors page. If you decide to manually enter a sensor, you must enter the correct sensor name or it will not work. After selecting which sensor you wish to use, give it a value that the live data will be tested against. Going back to the oil level example, you could set the sensor name to "OilLifeLeft", the test value to 20, and the operator to "<". That way the live oil life data is tested to see if it is less than 20%. For a quick lesson on equality operators, check out [this page](#). Once you have your sensor set the way you want, click the "add sensor" button. You can have multiple sensors on a sequence, so feel free to add as many combinations as you like! When you are all done, be sure to click "add trigger" to finalize the trigger creating process.

Now that you have your triggers set up, the next step is to create the action(s) the vehicle will perform once the trigger executes.

Action - Text Message

An action, as the name suggests, will be the result of a trigger being activated. There are a variety of actions that you can choose from. Clicking on the actions drop down box will show you all the different types of actions available to you. We will first discuss the text message action box seen in Figure 6.

The screenshot shows the Moonbase 'Create Sequence' interface. On the left is a dark sidebar with navigation links: Home, Sequences, and Create Sequence. The main header area contains the Moonbase logo and the title 'Create Sequence'. Below the title are two buttons: 'CREATE SEQUENCE' and 'EDIT IN JSON'. A 'Sequence Name*' input field is positioned above a section titled 'Triggers' with a dropdown arrow and the text 'Add Triggers to Sequence'. Below this is an 'Actions' section with a dropdown arrow and the text 'Add Actions to Sequence'. Inside the 'Actions' section, there are five tabs: 'TEXT MESSAGE' (which is selected and underlined), 'EMAIL', 'REMOTE OPERATION', 'ON DEMAND', and 'HTTP'. The 'TEXT MESSAGE' tab contains the following fields: 'Action Name', a 'Cooldown' dropdown set to '0 sec', a 'Message' text area, and a 'Phone Number' input field with an 'ADD' button next to it. At the bottom of the 'Actions' section is an 'ADD ACTION' button.

Figure 6. Text Message Action

This is very self explanatory action. When you trigger is activated, you can send a text to whichever phone number(s) that you add to your sequence. The action name can be whatever you want it to be. It is recommended highly that you include a cool down so that you do not receive spammed text messages. The message field will be what the text will say and the phone number field is where you will enter the correct number. Make sure to include your [country code](#) in the phone number or else you will not receive a text (this includes the '+'). Click the 'add' button to add the phone number and then click the 'add action' button to finalize the action. Similarly we have the email action.

Action - Email

The email action is very similar to the text message action. You can see the difference in Figure 7.

The screenshot shows the Moonbase 'Create Sequence' interface with the 'EMAIL' tab selected. The layout is identical to Figure 6, but the fields within the 'EMAIL' tab are: 'Action Name', a 'Cooldown' dropdown set to '0 sec', a 'Subject' text field, a 'Body' text area, and three input fields for 'Email', 'Email CC', and 'Email BCC', each with an 'ADD' button next to it. The 'ADD ACTION' button remains at the bottom.

Figure 7. Email Action

Action and cooldown are the same from the text message action. The remaining boxes are exactly the same as sending an email normally. Include the subject, message and email fields in order for the action to work. If you're working in a group, you can CC or BCC the other members in your group if they wish to receive the email as well. Make sure to click the 'add' button for all the emails that you want to include in your action. Like all the other actions, click the 'add action' button to finalize. Next, we will move on the more complicated actions.

Action - Remote Operation

The remote operation action is used for controlling the vehicle. For example, you can lock or unlock the doors at a certain time of the day. The remote operations action looks like Figure 8.

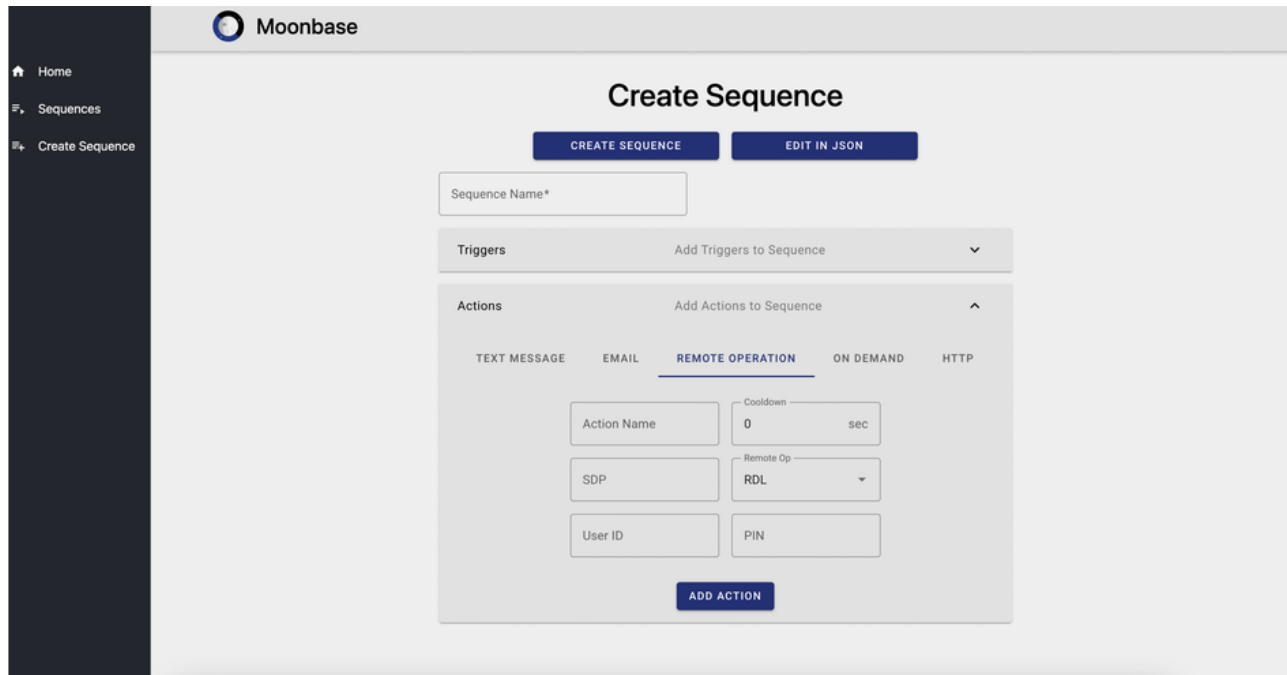
The screenshot shows the Moonbase web application interface. On the left is a dark sidebar with navigation links: Home, Sequences, and Create Sequence. The main content area is titled 'Create Sequence' and has two buttons: 'CREATE SEQUENCE' and 'EDIT IN JSON'. Below these is a 'Sequence Name*' input field. There are two expandable sections: 'Triggers' with a dropdown arrow pointing down, and 'Actions' with a dropdown arrow pointing up. The 'Actions' section is currently expanded and shows five tabs: TEXT MESSAGE, EMAIL, REMOTE OPERATION (which is selected and underlined), ON DEMAND, and HTTP. Under the 'REMOTE OPERATION' tab, there are several input fields: 'Action Name', 'Cooldown' (set to 0 sec), 'SDP', 'Remote Op' (a dropdown menu currently showing 'RDL'), 'User ID', and 'PIN'. At the bottom of the 'Actions' section is an 'ADD ACTION' button.

Figure 8. Remote Operation Action

Again, the action name and cooldown are the same as the other actions. SDP stand for service delivery platform and what you need to know about that is very little. If you happen to know if the car you have the vin for is running a R1 head unit, use Ignite; however, if the car is using a VP4R head unit, you will use SXM. Ask one of the innovation challenge leaders for which car you have if you are unsure which head unit it is running. Then we move onto the remote op. RDL is for locking the car doors, RDU is for unlocking the car doors, REON is for remote starting the car, and REOFF is for turning the car off. PIN and User ID are not important for the sake of this challenge, so you can fill them out with whatever you want. Now we will discuss the on demand action.

Action - On Demand

The on demand action is used to execute an ADA policy (which is just a set of commands for the vehicle). You will most likely not being doing a lot of on demand actions for this challenge since you will not have access to ADA or policy creation. For the sake of explanation, however, the on demand action box looks like Figure 9.

The screenshot shows the Moonbase web application interface. On the left is a dark sidebar with navigation links: 'Home', 'Sequences', and 'Create Sequence'. The main content area has a header with the Moonbase logo and the title 'Create Sequence'. Below the title are two buttons: 'CREATE SEQUENCE' and 'EDIT IN JSON'. A text input field for 'Sequence Name*' is present. Below this is a 'Triggers' section with a dropdown menu labeled 'Add Triggers to Sequence'. The 'Actions' section is expanded, showing a dropdown menu labeled 'Add Actions to Sequence'. Within the 'Actions' section, there are tabs for 'TEXT MESSAGE', 'EMAIL', 'REMOTE OPERATION', 'ON DEMAND' (which is selected), and 'HTTP'. The 'ON DEMAND' tab contains the following fields: 'Action Name', 'Cooldown' (set to 0) with a 'sec' unit, 'Policy #' (set to 0), 'Devices' (a dropdown menu), and 'Environment' (a dropdown menu). At the bottom of the 'ON DEMAND' section is an 'ADD ACTION' button.

Figure 9. On Demand Action

The policy number is the identifier for the policy you want to fire (again, unlikely that you will have any access to this feature). Devices are for the type of head unit the car is running. The environment is important, but for the scope of this challenge you can just choose dev. Hit 'add action' to finalize like usual. Finally, we have the HTTP request action.

Action - HTTP

For those who want to implement APIs into their sequences, we have the HTTP action. It looks like Figure 10.

This screenshot shows the same Moonbase 'Create Sequence' interface as Figure 9, but with the 'HTTP' tab selected in the 'Actions' section. The 'ON DEMAND' tab is no longer active. The 'HTTP' tab contains the following fields: 'Action Name', 'Cooldown' (set to 0) with a 'sec' unit, 'URL', 'Remote Op' (a dropdown menu set to 'GET'), 'Query String', and 'JSON Payload' (a text area). An 'ADD ACTION' button is located at the bottom of the 'HTTP' section.

Figure 10. HTTP Action

If you know the url for the API, you can add it to the url field. For a brief explanation of the types of HTTP requests you can make, check out [this website](#). The JSON payload is what you will be sending the API for it to parse and perform an action upon. It is recommended that you

make the JSON in an [online editor](#) and then pasting into the JSON payload box. Finally, there is the query string field. For more information on query strings, look at [this website](#).

Finalizing Your Sequence

Now that you are familiar with the different types of actions, we can hit 'create sequence'. This will take us to a page like the one in Figure 11.

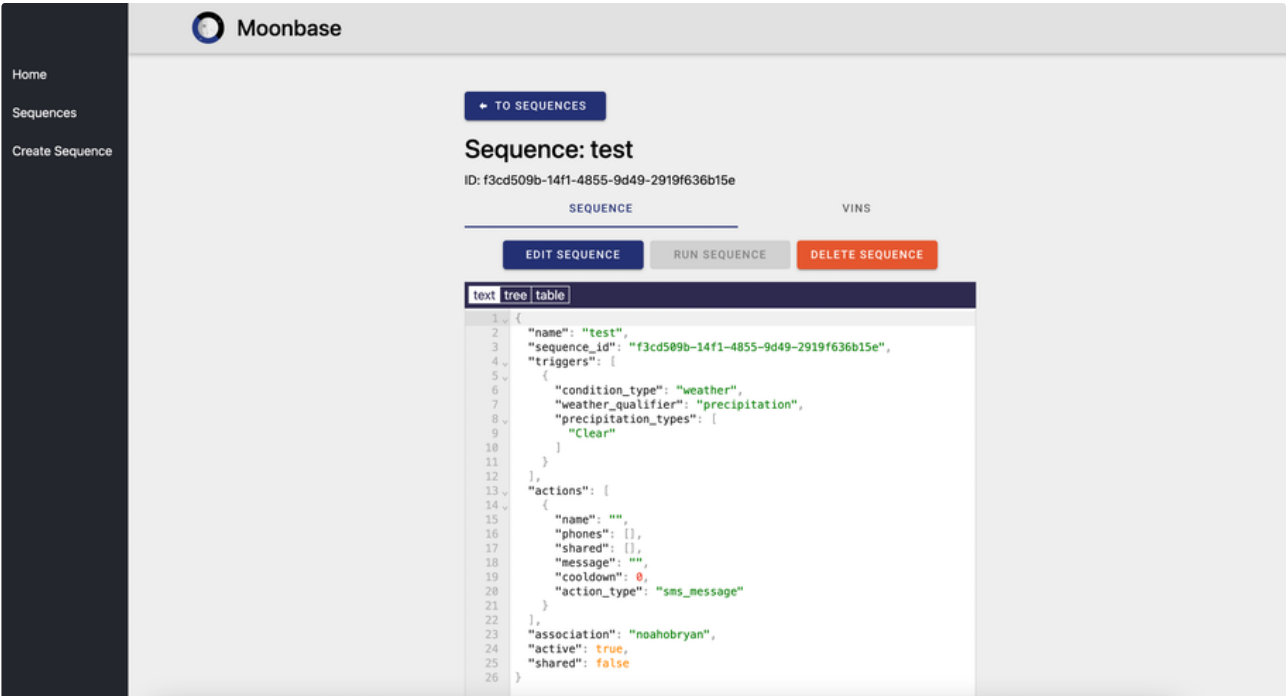


Figure 11. Finalize Sequence Page

This page will allow you to edit, run, or delete the sequence. You can view this page from the sequence list page as well, but before you quit out of this page you need to navigate to the 'VINS' tab at the top of the page. This will look like Figure 12.

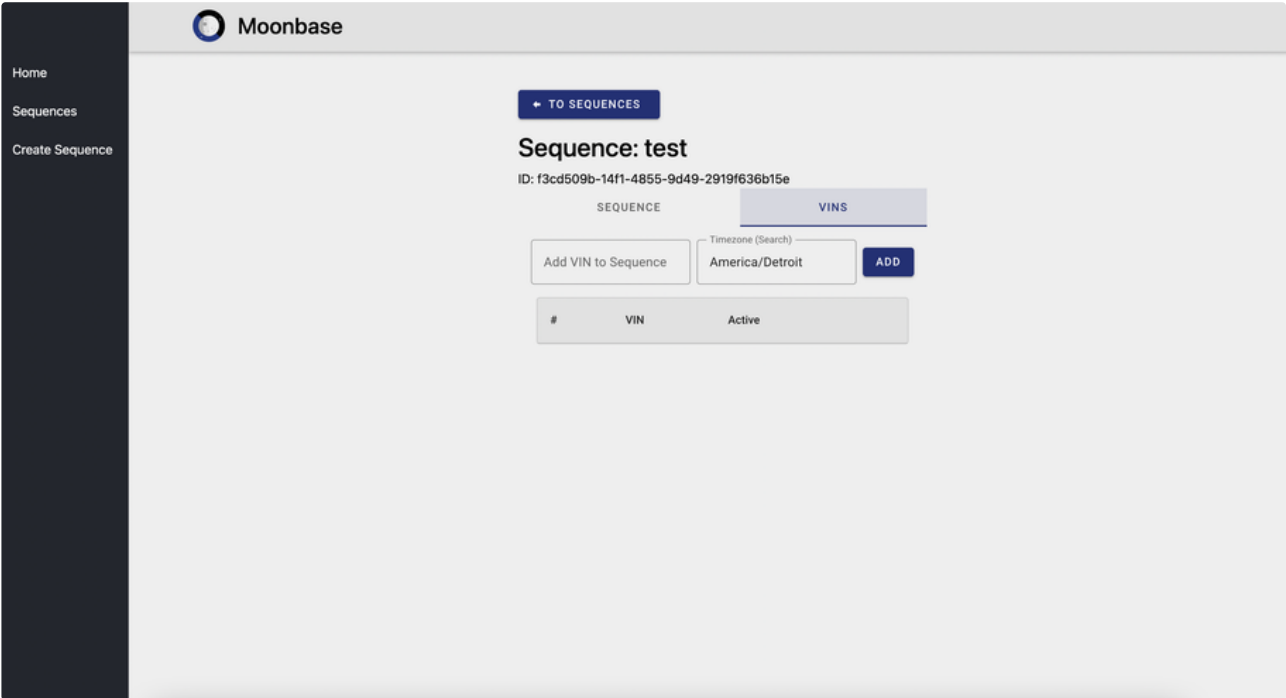


Figure 12. Add Vins Page

You can either ask for a vin or enter a fake vin of your choosing, but you must add a vin or else your sequence will get lost in the website. Keep the timezone the same and hit 'add' once you have entered a vin. Congratulations, you have successfully made your first sequence!