



Volvo Plugin for HomeSeer HS4 Manual

Introduction

Thank you for using the Volvo Plugin for HS4! This plugin can be used to read the status of your Volvo and control some functions, similar to Volvo's apps for iOS, Android and Windows. Please see *Requirements* for more info. This plugin does not connect directly to the car, but accesses Volvo's cloud, just like the apps.

This is my third plugin for HS4. My other plugins are the MiLight Plugin and Horizon Remote Plugin. My main motivation to develop these plugins is to get better and better at C# development, and because I want the functionality for my own system.

I have tested this plugin thoroughly, but if you find bugs anyway, please let me know.

Bernold

Requirements

To use this plugin, you will need the following:

- HomeSeer HS4. The plugin has only been tested on Windows and Linux.
- One or more Volvos with a working Volvo On Call subscription.
- Please make sure you have the right level of security measurements (restricted access to your HomeSeer machine, HomeSeer environment, etc.). If you are in doubt, don't use this plugin.

Known issue

It seems the plugin, which uses a reverse engineered API, does not work with 2021+ cars and/or Android cars. The official app likely uses a newer API, which is officially still in beta. When adding a Volvo ID with only such car(s) you may be told "there is no car under this account".

Installation/Configuration

1. Install and activate the plugin like any other plugin. If you're new to HS4, here is how:
 - Go to your HomeSeer *Web Control page*.
 - Use the *Plugin* dropdown and choose *Add*.
 - Use the (2nd) Search bar, or scroll to *Volvo Plugin*.
 - Choose *Install*.
 - In *Plugins > Installed* use the toggle to turn on the plugin.
2. Configure:
 - During first setup, please first configure the *General Settings*:
 - Go to *Plugins > Volvo Plugin > Step 1. General Settings*.
 - Follow the steps:
 - Choose *Continue* at the introduction step.
 - Set the update frequency for Status features. This tells the plugin how often to connect to Volvo's cloud and update these features. Please note that everything is reverse engineered and it is unknown what frequency Volvo considers a lot. It is unknown if Volvo monitors this kind of usage, if they give warnings, or if they will block your account. Also consider that, for example, every minute does not seem like a lot, but that's 60 times every hour, 1440 every day and about 44000 times every month(!). Choose *Continue*.

- Set the update frequency for Position features. Reading the position is a separate call to the cloud. When set to *Same as Status Frequency setting*, it will mean the amount of calls to the cloud is doubled. When set to *Dynamic (only when engine is running)*, it will only update when the engine is running (and when the plugin starts, and one time after the engine is stopped). Therefore *Dynamic* is Recommended for cars that update position while driving. If the position is not updated while driving, the recommended setting is *Only when engine was just stopped*. Choose *Continue*.
- Set the update frequency for temperature/weather features. Please note that it is unknown if the number or API calls are monitored and if extensive use can cause (IP) bans.
Then selected which weather features you want created for your car(s): no weather features, just temperature (like the app), or more weather info.
Then selected which weather features you want created for your home: no weather features, just temperature (like the app), or more weather info.
Noteworthy: Home weather features are based on the location you entered at the HS4 setup and these coordinates are only read at plugin initialization. If you modify coordinates, please restart the plugin to reload the coordinates.
- Set your desired measurement system, *Metric* or *Imperial*. Noteworthy: The cloud values are all metric. So if you choose Imperial, values will be converted.
- Choose *Save Settings*.

Next, add at least one Volvo ID:

- Go to *Plugins > Volvo Plugin > Step 2. Add (or modify) Volvo ID*.
- Follow the steps:
 - Choose *Continue* at the introduction step.
 - Choose *Add a new Volvo ID*. Choose *Continue*.
 - Enter the email address associated with your Volvo ID. Choose *Continue*.
 - Enter the password for this Volvo ID. Choose *Continue*.
 - Select your geographical region. Choose *Continue*.
(If you're not sure about these settings, just make sure they are the same as your app).
 - Verify the entered information by choosing *Verify*. A call to the cloud will be made, verifying that the account is working and that at least 1 car can be found. If not, the plugin will let you know. If everything seems ok, you will go to the next step.
 - Choose *Save* to save these settings.
 - If wanted, you can now use the page again, to add another Volvo ID (if you have more than one).

You can also use the same page to modify these settings, if you've modified your Volvo ID with Volvo and need to change your email address and/or password.

Next, add at least one car:

- Go to *Plugins > Volvo Plugin > Step 3. Add Volvo(s)*.
- Follow the steps:
 - Choose *Continue* at the introduction step.
 - The plugin will then list all cars that it can find associated with your Volvo ID(s), that have not been added already. Leave a checkmark with every car you want to add and choose *Save*. This will save the selected car(s) to the settings and will create a device and feature for every car you selected and saved. Also, this will (re)start the Status read calls to the cloud. All other features will be created when the Status is first updated (time depending on the frequency setting in General Settings).

Devices and Features

There are quite a lot of (feature) devices being created. This chapter gives you more information on them. Some cars do not support every feature. Features will only be created when it's available in the cloud. Every (feature) device has a name that starts with your license plate number, unless that's not available in the cloud (your dealer has messed up). Then the VIN number will be used. You may notice that there is a little more information and functionality than the app shows you. For example, Fuel Amount Level, Status Update.

If you come across a feature that says Undocumented, that means the status that occurs is not yet known. If this happens, please let me know what the status is according to the Status JSON (see View JSON). I will then add the status in a next version. I chose not to guess what any status might be, to not give you the impression that a "low" or "bad" status will actually trigger any event you create with it. Instead, I spent hours gathering JSON files online to try to make it as complete as I could.

If there are features you don't need, do not delete them, as they will be recreated. Hide them instead.

Here is the complete list:

- **Device:** This is the mandatory (root) device. Do not delete. It will delete every feature. Hide instead, if needed.
- **Read Status:** This feature will let you know if the last call to the cloud was successful or not. Please note that this feature does not have the setting Last Change Time on Updates Change Only. This means the Change Time will update with every call to the cloud, to ensure that you can always trust the status.
The button *Force Update (Car to Cloud)* will tell the Volvo cloud to ask the car to update the status to the cloud, which usually is not needed. Seems useful for updating while the car is not in use, for example with features HV Battery Level and doors/windows. Please note that this may drain battery and has the car's mobile subscription use more data. Also note that the features will not actually update until next polling (or Manual Update).
Personal Experience Note: For my car, using this function again in ± 130 seconds or less will result in a POST error.
The button *Manual Update from Cloud* allows you to force a read and update all the car's features in between polling.
- **Average Fuel Consumption:** Your car's fuel efficiency in liter per 100km (1 decimal), or miles per gallon (no decimals).
- **Average Speed:** Your car's average speed in km/h or mph (no decimals).
- **Brake Fluid:** The status of your brake fluid. Only status so far is Normal.
- **Bulb Failures:** The status of your car's light bulbs, OK, or Failure(s). No details will be provided (Again, no information found online – if anyone feels like disconnecting bulb by bulb, including a connected trailers, and provide me with JSON files of every status I would be happy to add them).
- **Car Locked:** Whether or not your car is locked. If supported, buttons will be created to Lock or Unlock. Notice that, just like in the app, unlock will not fully unlock your car, but your trunk. Open the trunk to unlock the rest of your car. Unlock should only available for a few minutes, for safety reason. This plugin does not have any influence on that.
- **Connection Status:** A bit of a strange feature. It looks like it is the connection status for HV (EV) cars, but there's a separate status for that. Known status so far: ConnectedWithPower, ConnectedWithoutPower, Disconnected.
- **Distance to Empty Fuel Tank:** The estimated distance you can still drive until your car's fuel tank is empty, in km or miles (no decimals).
- **Doors Front/Rear Left/Right Door/Hood/Tailgate Open:** Status of your car's front/rear left/right/hood/tailgate door: Open or Closed.
- **Engine Coolant Level:** Status of your car's engine coolant level. Not supported on most cars. Known status so far: High
- **Engine Running:** Status of your car's engine, Running or Not Running. If supported, buttons will be created to Start or Stop the engine. Engine will then be started for 1-15 minutes, depending on the next feature.

- **Engine Running Minutes Setting:** The setting for the Start button of the Engine Running feature. I chose not to make this a general setting, because 1. not every car supports engine starting and 2. this allows you to use a different setting if you have more than one car that supports it.
- **Engine Remote Start (ERS) Status:** The status of Engine Remote Start (ERS). Known status: Off, On, OnByDirectCtrl.
- **Engine Remote Start (ERS) Warning:** The status of Engine Remote Start (ERS). Known status: None, Other, MaxAttemptsExceeded.
- **Fuel Amount:** Your car's fuel amount, in liter or gallon (no decimals).
- **Fuel Amount Level:** Your cars fuel amount level (percentage, no decimals).
- **Heater Status:** The status of the heater. Known status: Off, On, OnOther. If supported buttons will be created Stop/Start Remote Heater.
- **Heater Seat Selection Front/Rear Driver/Passenger/Mid Side:** The seat selection for heated chairs when you turn on the remote preclimatization/heater. Selected or Unselected. This will also show seats that cannot be heated.
- **Heater Timer 1/2 Time:** The times at which timer 1 and timer 2 will switch on the remote preclimatization/heater, if enabled. You can modify the time in HH:mm format (HH = hours 00..23, mm = minutes 00..59).
Noteworthy: Modifying the time does not enable the timer, like in the app. And value string will update on next polling, not after submitting the time.
- **Heater Timer 1/2 State:** Whether or not timer 1 or timer 2 are enabled (buttons Off/On).
Noteworthy: Status value will update on next polling, not after using the buttons.
- **HV Battery Charge Mode Status:** Charge mode status for the HV battery. Known status: None, Allowed
- **HV Battery Charge Status:** Charge status. Known status: PlugRemoved, PlugInserted, Started, ChargeProgress, ChargeEnd.
Personal Experience Note: I noticed that with my car, ChargeEnd may come after more than a half hour later compared to HV Battery Charge Status Derived status CablePluggedInCar_FullyCharged and HV Battery Level of 100%. I used to think this was because of the cooling fan running, but there is too much power being drawn (>2kW) for it to be only the cooling fan. This may be different for other cars.
- **HV Battery Charge Status Derived:** Derived charge status for the HV (Hybrid Vehicle) battery. Unknown why this is a separate status. Known status: Unknown, CableNotPluggedInCar, CablePluggedInCar_Charging, CablePluggedInCar_FullyCharged.
- **HV Battery Charge Warning:** Charge warning for HV battery. Known status: UnexpectedPowerloss. Noteworthy: Since there seems to be only one status, this feature does not have the setting Last Change Time on Updates Change Only. The time will update if the status was set (again) since the last readout (depending on your frequency setting in General Settings).
- **HV Battery Distance to Empty HV Battery:** The estimated distance you can still drive until your car's HV battery is empty, in km or miles (no decimals).
- **HV Battery Level:** How full the HV battery is (percentage without decimals). Note that while charging this may not update with every percent. *Force Update (Car to Cloud)* will help. This might become a dynamic setting in a future version. If you need it earlier, build an event for it. Again, watch out for extensive calls to the cloud.
- **HV Battery Time To HV Battery Fully Charged:** The required time in minutes to fully charge the HV battery. May very likely need Status Update during charging for accurate estimation (since you can charge with different amperage). Will investigate for a future version.
- **Honk and Blink:** If supported, buttons will be created for Honk (honks horn a few times), Blink (blinks left/right indicators a few times), Both, Honk and Blink.
- **Odometer:** Your car's odometer in km or miles (max. 3 decimals).
- **Oil Level:** Status for the oil level of your car. Definitely not supported on many cars (yet). Known status: Normal
- **Oil Pressure:** Status for the oil pressure of your car. Definitely not supported on many cars (yet). Known status: Normal
- **Parked Indoor:** Whether your car is parked Indoor or Outdoor.

- **(Calculated) Position Latitude/Longitude:** (Calculated) Latitude/Longitude of your car's position in decimal notation. You may notice that the number of decimals is actually greater if you use View JSON. Unfortunately a feature cannot be more precise, because of how HS4 works internally (value is defined as a double). Also, the number of decimals depends on the whole number (0-9 will get 14 decimals, 10-99 will get 13 decimals and 100-180 will get 12 decimals). This is also why no number of decimals (Dec Places) has been set for this feature – both the Value and Status (string) are updated.
- **(Calculated) Position Heading:** The (calculated) direction your car is heading in degrees (no decimals). Will be 0° if the car is standing still.
- **(Calculated) Position Speed:** Your car's (calculated) speed in km/h or mph (number of decimals yet to be determined).
- **Preclimatization:** If supported, buttons will be created to Start/Stop Preclimatization. Unfortunately at this point there is no known status available.
- **Remote Climatization Status:** Status of the Remote Climatization. A bit of a strange status feature. Looks like a double of Connection Status. Has something to do with heater (some statuses won't allow heater starting) and does not seem to have anything to do with preclimatization. Known status: N/A (null), NoCableConnected, CableConnectedWithPower, Charging, RemoteClimatization, Climatization.
- **Service Warning Status:** Indicates whether your car needs service. Known status: Normal, AlmostTimeForService.
- **Theft Alarm Latitude/Longitude:** The Latitude/Longitude of the position of your car the last time your theft alarm went off. Only available if the alarm ever went off. So you may want to lock up someone and make them move ;)
- **Time Fully Accessible Until:** The time until your car can be fully read from the cloud. After that it will update less often to save battery power. Please note that this time is converted from GMT to the OS system time of your HS4 installation.
- **Time Partially Accessible Until:** The time until your car can be partially read from the cloud. After that it will go to sleep to save battery power. Please note that this time is converted from GMT to the OS system time of your HS4 installation.
- **Trip Meter 1/2:** Your car's Trip Meter 1 and 2 in km or miles. Max. 3 decimals. Although 2nd and 3rd decimal seem to always be 0 (in km, as miles are converted).
- **Tyre Pressure Front/Rear Left/Rear Tyre Pressure:** Status of your tires. Known status: Normal.
- **Washer Fluid Level:** Status of the window washer fluid level. Known status: Normal, Low.
- **Windows Front/Rear Left/Rear Window Open:** Status of your car's windows. Open or Closed. Notice that if a window seems closed and status says open it may be open just a little. Another push up on the button in your car may solve this. You may also ask your dealer if your windows can be calibrated.

Weather Features

When enabled, the plugin can give you the temperature nearby your Volvo(s), just like in the app. Or even give you more weather info from the same source. And as a bonus you can also configure the plugin to give you this information for your home, using the coordinates from the HS4 setup (only loaded at plugin start, so if you change coordinates, restart the plugin). Please note that there are no actual measurements near your car. The info comes from a cloud API (same as Volvo app uses). Values are not converted by the plugin, but the API is called either with or without metric setting.

- **Temperature Nearby:** The temperature nearby in °C or °F, depending on your Measurement System settings.
- **Humidity Nearby:** The humidity percentage.
- **Wind Speed Nearby:** The wind speed in km/h or mph.
- **Wind Direction Nearby:** The wind direction in degrees.
- **Wind Direction Nearby Description Short:** The wind direction in N, S, E, W, etc.
- **Barometer Pressure Nearby:** The barometer pressure in mbar or inHg (inches of Mercury).

Feature Access

You may want to consider limiting access to a/several feature(s) by clicking on each feature and under *User Access* remove the *Any* checkmark, chose your (admin) account(s) instead and then *Save*.

Remove settings

To remove a setting, like a Volvo ID or a car, you can use the *Remove Settings* page. You can remove a Volvo ID, or a car from the settings. These actions are fully reversible, by adding them again (Adding a car will give error messages in the log, because the device and *Read Status* feature already exist).

Or you can remove a car from settings and remove its device and features. This is not reversible. You can add a car again and devices will be created again. But they will get new reference numbers and therefore events tied to them will not work without modifying those, too.

- Go to *Plugins > Volvo Plugin > Remove Settings*.
- Follow the steps:
 - Choose *Continue* at the introduction step.
 - Choose what you want to have removed. Then *Continue*. This will populate next step.
 - Select which item you want removed. Then choose *Continue*.
 - If you are very sure, select *Yes* and then *Remove Now*.
- Repeat if needed.

View JSON

Some of the JSON data that is read from the Volvo cloud and which is used internally in this plugin can be viewed. This was created for debugging purposes and I decided to leave it, so you can view the full information about your car(s). Also, this is where you can see what status features are based on, in case a feature gets the *Undocumented* status.

To use the viewer, the Volvo ID must already be in the settings. A car does not have to be added to the settings yet.

- Go to *Plugins > Volvo Plugin > View JSON*.
- Follow the steps:
 - Choose *Continue* at the introduction step.
 - Select a car from the dropdown. Choose *Continue*.
 - Select which JSON you want to view:
 - Position contains position information.
 - Trips contains max. 100 of your last trips.
 - Attributes contains information about your car and includes information about what status features are available.
 - Status contains the information on which features are based.Choose *Continue*.
 - Select the format you want to view the JSON in:
 - Pretty: The JSON as read from the cloud, made more readable with spaces, tabs, etc.
 - Redacted: Pretty format, with everything privacy related redacted. Use this if you need to provide data to me for debugging purposes. Note: Attribute codes, like are not redacted. The examples I found online had duplicate codes for, for example, engine and gearbox. They don't seem to invade your privacy. However, online many of these codes are redacted anyway. If you're in doubt, remove them manually before sharing.
 - Raw data: The JSON as read from the cloud (no formatting).Choose *Show Data*.

Download Driving Journal

Just like the app, the plugin allows you to download the Driving Journal of any of your Volvos in CSV format. The data is based on the Trips JSON and the general setting for Measurement System (Metric/Imperial) is applied.

To be able to download the CSV file, the Volvo ID must already be in the settings. A car does not have to be added to the settings yet.

- Go to *Plugins > Volvo Plugin > Download Driving Journal (CSV)*.
- Follow the steps:
 - Choose *Continue* at the introduction step.
 - Select a car from the dropdown. Choose *Show Data*.
 - A download should now be started.

You can open the CSV (Comma Separated Values text) file with most common spreadsheet applications, like Microsoft Excel, LibreOffice Calc, Google Docs, etc.

Please note that I tried to mimic the CSV from the app as much as possible. However, there are a few differences:

- I added a "sep=;" in the first line, to make (at least) Excel recognize columns.
- The app seems to leave out decimals and seconds (Duration), without rounding them off. That did not make sense to me, so I made it as precise as I could.

Please note that times (Started, Stopped) are converted from GMT to the OS system time of your HS4 installation.

Geofencing

Version 1.0.3.0 of the plugin adds geofencing triggers.

Personal experience note: While I'm sure there must be cars that update their position while driving – otherwise, why would there be Position Heading and Speed? – my car only updates its position when I stop using it. This means I can't, for example, send ETA messages to someone I'm picking up when I'm approaching. Unless I would shut down the car at a traffic light, which does not sound like a good idea. But for example, turning on the hallway light works (with a short enough polling interval). Or I could send a message when I have arrived somewhere to keep someone up to date about my whereabouts.

Add location

To be able to configure a trigger, you must first add a location to the settings:

- Go to *Plugins > Volvo Plugin > Optional: Add (or modify) location*.
- Follow the steps:
 - Choose *Continue* at the introduction step.
 - In step 2, there is a dropdown that let's you:
 - Add a location manually
 - Add the location from your HS4 settings
 - Previously added location(s), to modify
 - Pick a location you have visited earlier, from your past TripsStart by selecting an option from the dropdown. Then, if needed, make changes to the Location Name, Latitude and/or Longitude.
 - Choose *Save* to save the location to the settings.

Please note that the decimal symbol (dot or comma) depends on your HS4 system's regional settings.

Example location



Step 1
About this page



Step 2
Select to add/modify
Simply select a location below and modify if needed.

Add location manually: New

Location Name

HomeSeer Technologies office

Location Latitude

42.933070

Location Longitude

-71.460352

BACK

SAVE



Step 3
Done

Modify a location

To modify a previously added location, go to the same page. Pick the location by name. You can then modify its name, latitude and/or longitude.



Step 1
About this page



Step 2
Select to add/modify
Simply select a location below and modify if needed.

Select location to add/modify

Add location manually: New

From Setup: HS4 location

Previously added (Modify): HomeSeer Technologies office

Remove a location

To remove a location, use the Remove a setting page: *Plugins > Volvo Plugin > Remove a setting*. In the dropdown, pick Remove a location (reversible).

Setting up the event trigger

- Create a new event and name it.
- At *IF*:
 - *Trigger*: Select *Volvo Plugin Location Trigger*
 - (*Subtrigger*): Select if you want the trigger to be fired if you are entering or leaving the virtual circle around the location.
 - *Select car*: Select which car you want to use in the trigger.
 - *Select location*: Select a previously added location from the settings.
 - *Enter radius*: Enter the radius for the virtual circle around the location.
- Save the trigger and continue filling in the THEN part of the event with the action of your choice.

Example event

Groups / Volvo location triggers / Email Rich about his parking space being taken today

✎ 📄 ✓ 🗑️ 🚶

IF

Trigger

Volvo Plugin Location Trigger ▼

Car enters geofence radius ▼

Select car

▼

Select location

HomeSeer Technologies office ▼

Enter radius

0.1 ▼

Radius in (based on Measurement System setting)
miles

THEN

Action

Send an Email ▼

Accuracy

Please note that, while the latitude and longitude seems very precise (lots of decimals), the location may still be off. You may have noticed that you often park next door. So pick your location carefully and do not set the radius too small.

Donate

As the Donate page (*Plugins > Volvo Plugin > Donate*) explains, I decided to make the plugin free. Mostly because everything is reverse engineered (not a published API) and I don't want be noticed by Volvo. Other home automation systems seem to get away with it so far. The amount of hours of research and development that went into this plugin – and is still to be expected during further reverse engineering, development and support – is much, much more than for my paid MiLight plugin. If you can, I'm asking to [buy that plugin](#) - which is reasonably priced - to support this one. That way HomeSeer will get their 25% share, too, which I think is fair for overhead, their developer support, maintenance of store, updater each time I have a new version, forums, etc. I did not think it would be fair to them to ask for a direct PayPal donation. And, or course, if it had been a paid plugin they would have gotten their share too.

Thank you for your support.

Support

If you have a question or want to report a bug, please use the dedicated sub-forum on <https://forums.homeseer.com/>

Changelog

Version	Remark
1.0.8.0	Fixed home weather setting being used correctly.
1.0.7.0	Improved code, now fully async. Reverse engineered Heater Timer settings, added buttons & textboxes for start time. Reverse engineered temperature nearby car, added feature(s). Also adds other weather info, plus weather info near HS4 (home). Polling now starts right away at plugin start, or after making changes to the settings. Fixed Preclimatization feature/buttons not being created. Fixed letting event trigger save when it's not fully configured. Fixed only enabled triggers firing. Less reloading of settings (less disk activity, faster).
1.0.6.0	Fixed trigger to work with future version HS4.2.17.0 (PSDK 1.4.3).
1.0.5.0	Fixed plugin looking for dll files in bin folder root and potentially not working if a user has old dll files there.
1.0.4.0	Replaced location trigger code to work without System.Device.dll (Linux/Mono fix). PluginStatus now updates to OKAY after adding car.
1.0.3.0	Added location settings and triggers (geofencing). Features are now created in a slightly more alphabetical order (still logically grouped). Fixed Position frequency dynamic reading, added new setting <i>Only when engine was just stopped</i> for vehicles that don't update while driving.
1.0.2.1	Fixed Devices Status bug introduced in 1.0.2.0 (runs once after updating)
1.0.2.0	Added button to manually update from cloud. Cleaner exit. Improved HTML pages. Optimized code.
1.0.1.6	Moved Preclimatization Stop and Start buttons to its own feature, making them visible for cars without heater. Added N/A status for Remote Climatization feature.
1.0.1.4	Fixed region (non-European cars) for POST commands.
1.0.1.3	Added more details to errors being logged.
1.0.1.2	Errors now written to Log while polling for Status or as response after sending a POST command (button).
1.0.1.0	Fixed Download CSV deployment. Added Copy to Clipboard button in View JSON. Added application icon (visible in Task Manager, Developer Mode) and console text. Optimized some code. Improved some texts.
1.0.0.2	Fixed PluginStatus Info text (typo, which broke a link). Added Download Driving Journal (CSV). Code optimizing.
1.0.0.1	Fixed timer bug. Added Info to plugin status for first time users. Added button response to the Log.
1.0.0.0	Initial release