DEEPCRAFT™ Voice Assistant user guide

About this document

Scope and purpose

This user guide is designed to provide clear, step-by-step instructions for logging in, generating projects, and testing those using audiovisual inputs. It serves as a comprehensive reference to help users navigate the platform, create new projects efficiently, and perform testing procedures with ease. The guide ensures that users can fully utilize the available tools and features to manage and validate their projects effectively.

Intended audience

The intended audience for this document includes design engineers, technicians, and developers of electronic systems who use the platform to design and test project models. It is suitable for new users seeking step-by-step guidance on basic functionality, existing users who need a reference for login, project creation, testing workflows and project designers and testers involved in building and validating models.

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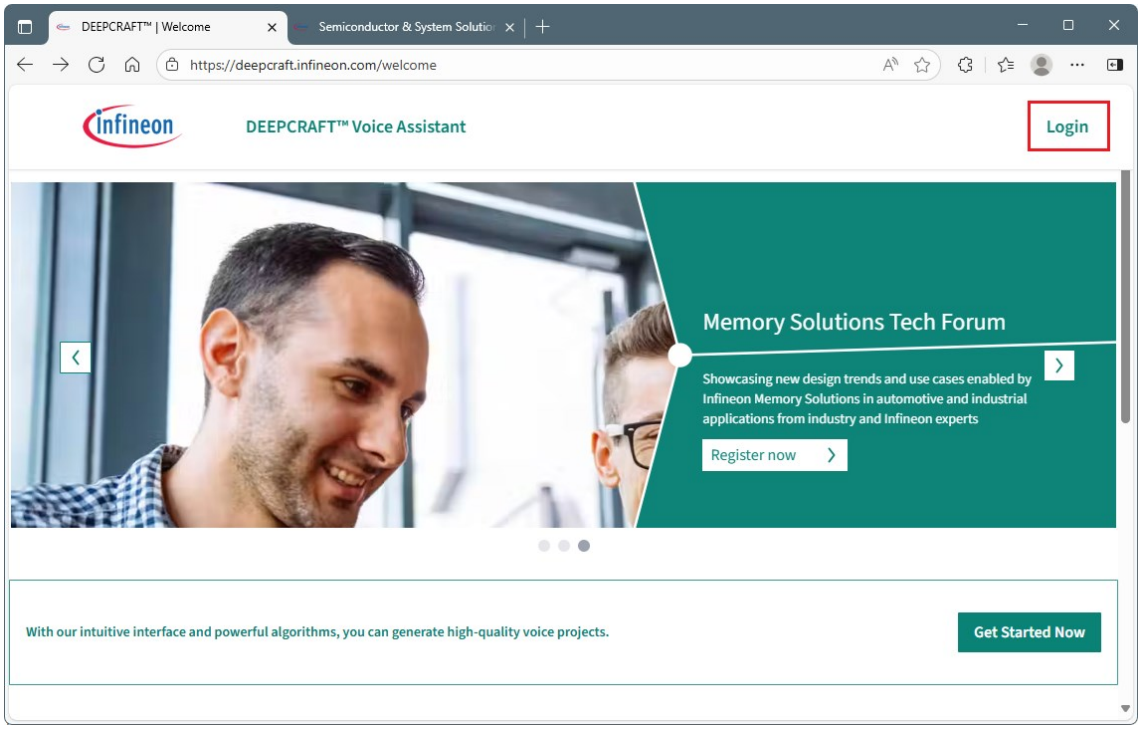
1 Introduction

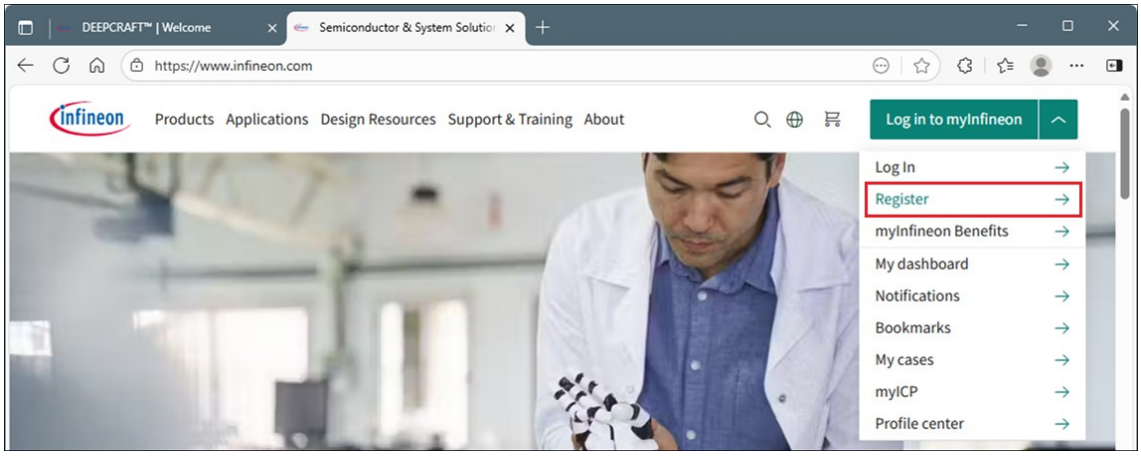
The DEEPCRAFT™ Voice Assistant (DVA) solution is a software platform designed for advanced speech recognition. It supports applications such as wake word detection for smart assistants, command recognition, and spoken language understanding on edge devices. DVA enables customizable wake words, speech synthesis, and automatic data augmentation, with machine learning for multiple command variations. It also provides C code for easy integration into projects, allowing efficient implementation of wake word and intent detection.

1.1 Accessing DVA and logging in

Open a web browser and go to https://deepcraft-voice-assistant.infineon.com to access the DVA. If you already have an Infineon account, click **Login**.

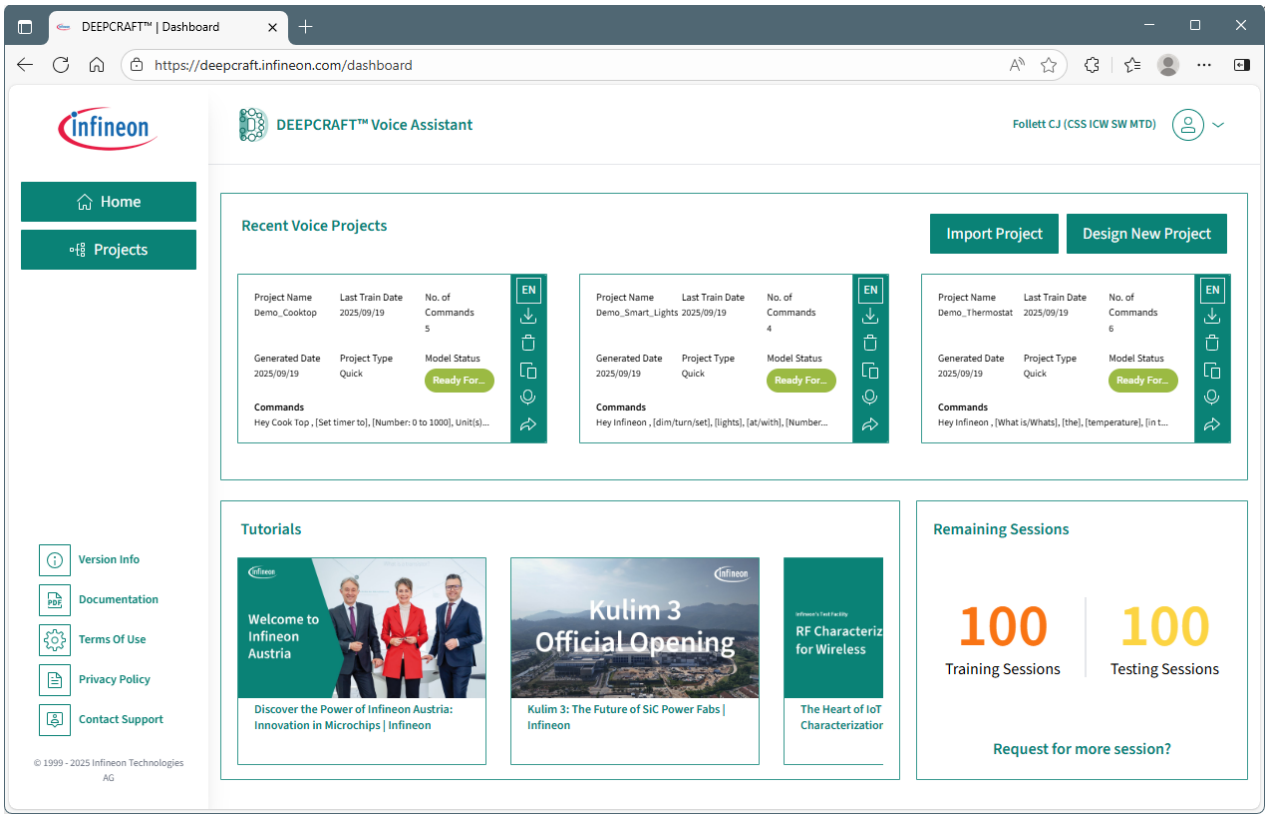


If you don't have an account, go to https://www.infineon.com/, and click **Register** to create an account. Then you can return to the DVA page and login.



2 GUI desciption

After logging in, the first thing you'll see is the DVA dashboard, which provides access to various existing projects, allows you to import and create new projects, and gives you links for documentation and additional information.



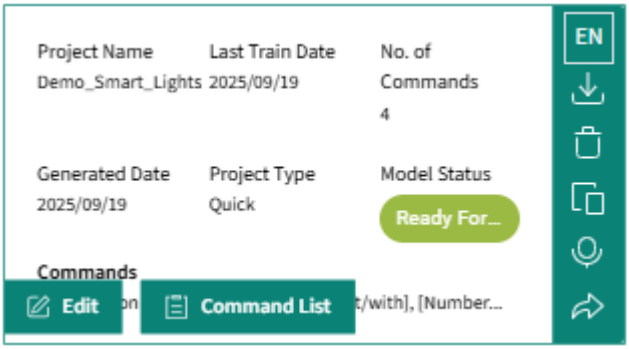
2.1 Projects

In the middle section of this page, there are pre-created demo projects available to experiment with. As a new user, these are the only projects you will see at first.

- If you want to create a new project, click **Design New Project** on the right. This process will be covered in the section Create new project.
- After you have created more projects, you can see them all by clicking **Projects** on the left. This looks similar to the Recent voice projects.

2.2 Project options

Each project is listed as a thumbnail with various details and options.

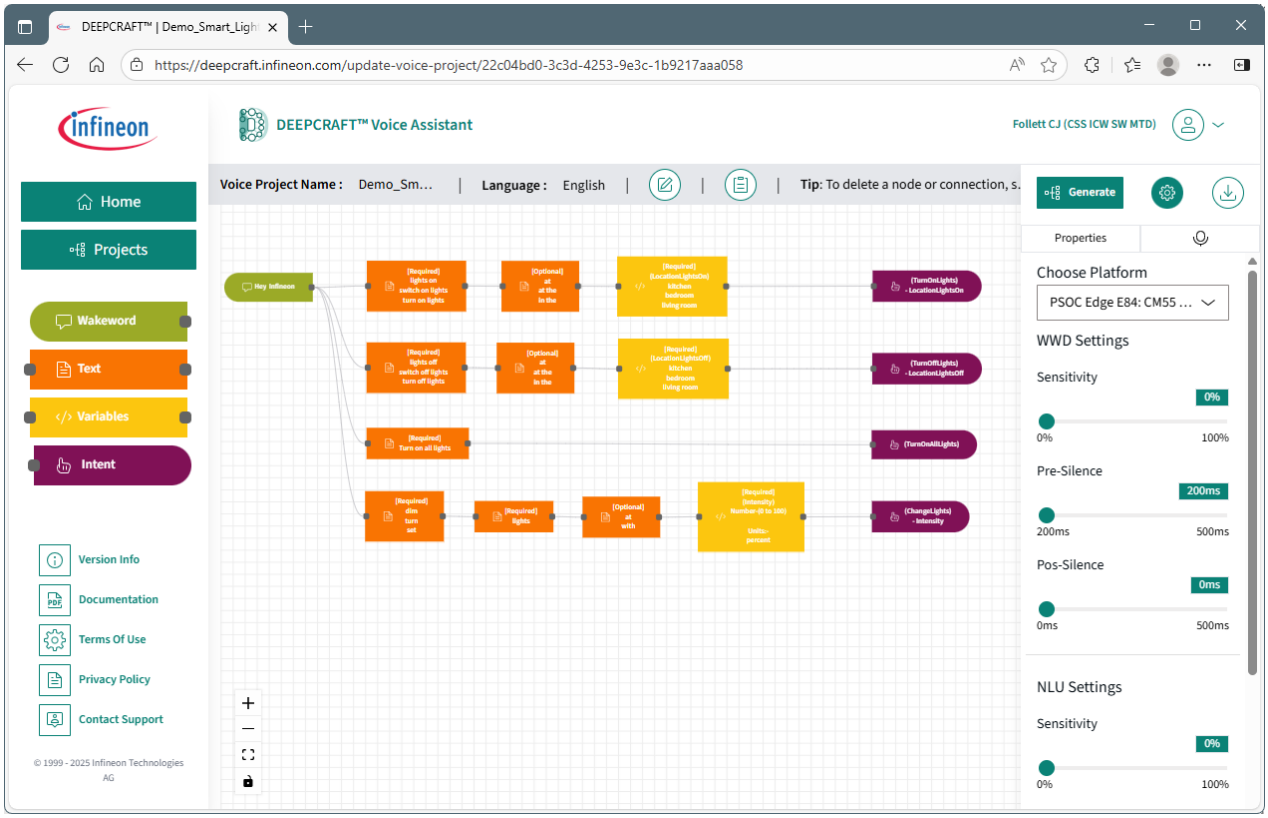


GUI desciption

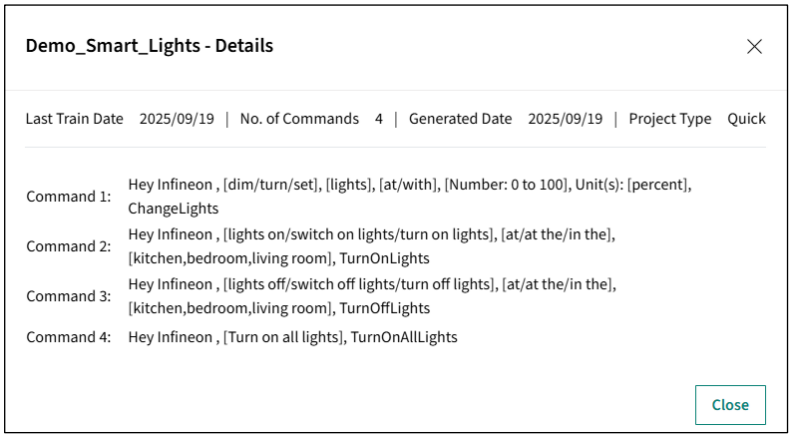
There are icons along the right side of the thumbnail.

- **Language** – This shows the language used in the project.
- **Download** – This option downloads the ZIP file containing the header (.h) file and a (.C) file. The button will only be enabled if the project status is ready for testing.
- **Delete** – This opens a prompt to confirm the deletion of the project.
- **Copy** – This opens a dialog to create a clone of the project with a name you specify.
- **Test audio model** – This option allows you to test the project if Model Status is "Ready for Test".
- **Export** – This allows you to export the project.

If you hover over an exsiting project thumbnail, you'll see **Edit** and **Command List** buttons. The **Edit** button opens the editing view for you to add, remove, and update various commands. See Editing view for more details.



The **Command List** button shows you the commands used in this project:

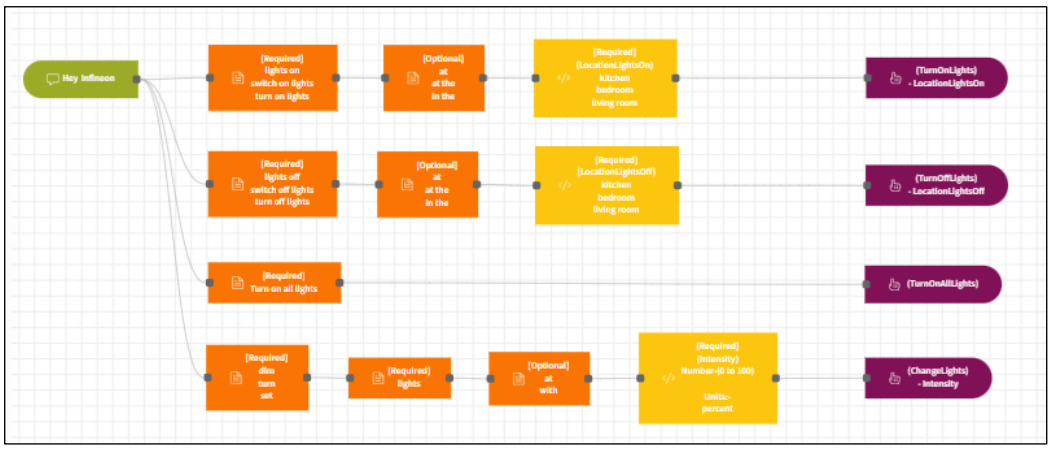


2.3 Editing view

The editing view for a project shows you a visual command model. This view has several sections that enable you to edit the various commands and properties in order to create and edit you model.

2.3.1 Command canvas

The main area of this view contains the visual representation of the project model. This shows how the various elements are structured to perform some action.



The elements include:

- **Wakeword** – This is a phrase that activates a device, like a smart speaker or virtual assistant. It is used to "wake up" the device so it can start listening and responding to your commands. You can enter any text (Infineon, Alexa, etc). For example, "Hey Infineon, Turn on the lights," where “Hey Infineon” is a wakeword.
- **Text** – This defines the core commands of the project. For example, "Hey Infineon, Turn on the lights." where "Turn on the lights" is the core command.
- **Variable** – This element in the command is based on the situation. For example, the command "Turn on the light" can vary to specify different locations, such as "Turn on the light in the bedroom" or "Turn on the light in the office ". Each of these variations represents a different situation or location.
- **Intent** – This is a specific action or purpose that you want to achieve through a command. For example, if you say "Turn on the lights" the intent is to activate the lights. Intents help the system understand the goal.

2.3.1.1 Canvas commands

At the bottom of the canvas, you'll see a vertical menu with **Zoom in**, **Zoom out**, **Fit view**, and **Lock**. You can use the **Zoom in/out** commands to make the canvas bigger or smaller. You can also use the mouse scroll wheel and the Ctrl key with + or – keys to zoom as well. **Fit view** restores the canvas such that all elements are visible. The Lock command freezes the model diagram so you cannot move individual elements. Instead, all elements will be moved as a single block.

If you move the cursor to an empty space on the canvas, it changes to a hand icon so that you can pan the canvas in aany direction.

2.3.2 Command palette

To the left side of the canvas, there is the palette where the command elements are available for selection. You simply click and drag an element from the palette onto the canvas to start creating/updating the model. Each element has properties, and elements must be connected to other appropriate elements. See ___ for more details.

2.3.3 Tools

Along the top of the canvas there are two project buttons:

- **Update Project Details** – This opens a dialog to edit the project name and language.
- **Command List** – This opens the same dialog you can open from the project thumbnail on the dashboard.

On the right side of the canvas, there both project commands and element properties:

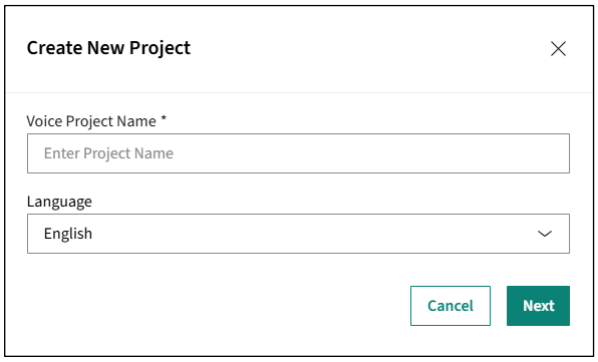
- **Generate** – Use this command to generate the model. This will only be enabled if the project status is "Not Generated" or "Failed" or any changes are made to the project during editing. It will remain disabled if no changes are made or the project status is "In Progress".
- **Settings** – This allows you to select the platform for model generation, right now only PSOC™ Edge 84: CM55 + U55 is supported, but other platforms will be supported in the future. You can configure wake word settings such as sensitivity, pre-silence, post-silence, and timeout. Similar settings are available for NLU, and you can also set up conditions like Delta Range.
- **Download** – After the model has been generated successfully, use this button to generate and download a ZIP file containing the wake word model and command model, which can be used on the embedded platform.
- **Properties** – This shows and allows you to edit the selected element properties.
- **Test Audio Model** – This option allows you to test the project if Model Status is "Ready for Test".

3 Getting started

This chapter covers how to get started creating a new project, creating a new model, then generating and testing the model.

3.1 Create new project

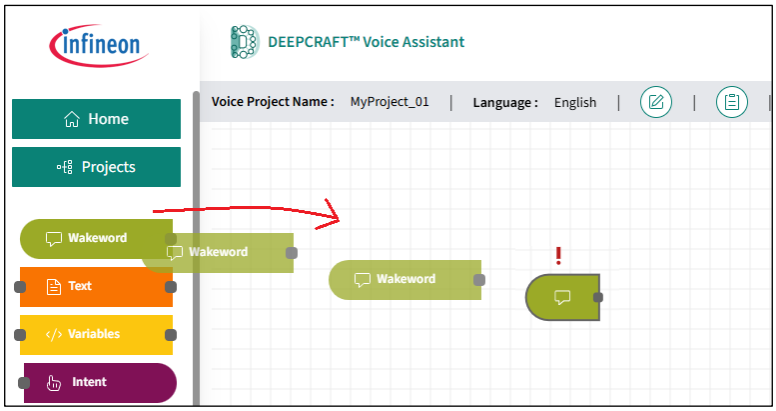
Click the **Design New Project** button on the top-right of the dashboard to open the Create New Project dialog.



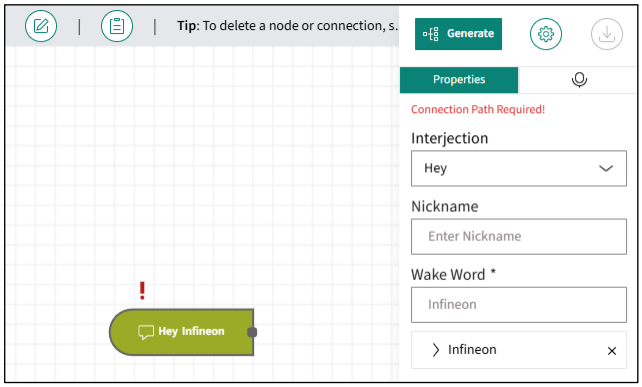
Enter the **Voice Project Name**, select the **Language**, and click **Next**. This opens a blank Command canvas.

3.2 Create a model

Using the Command palette, drag a Wakeword element onto the canvas.

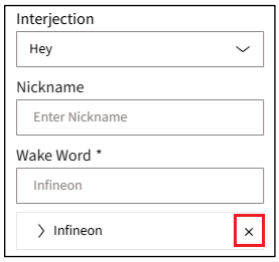


On the right side of the canvas, the Properties panel displays to enter the **Interjection**, **Nickname** (optional) and the **Woke Word**. Notice the element on the canvas displays the Wake Word you entered. We've entered Infineon, but you can enter any word you want.

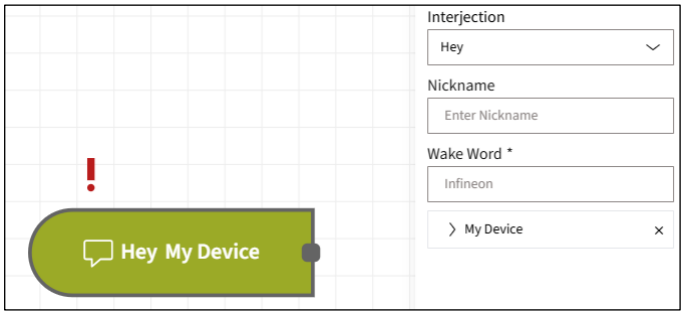


Getting started

If you want to change Wake Word, click the **X** to delete the the existing one:

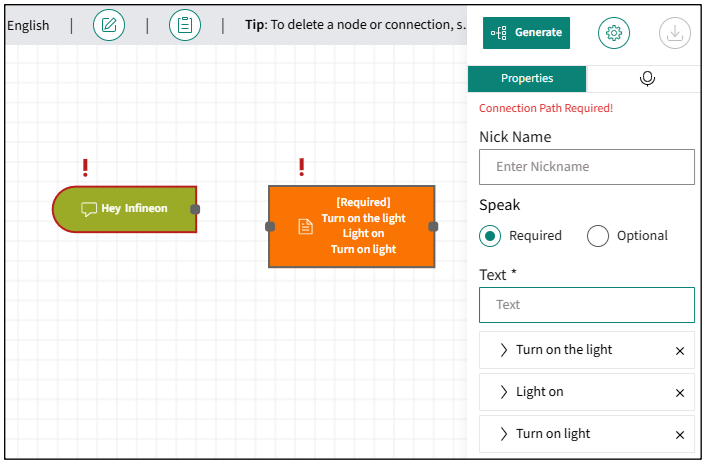


The enter a new Wake Word:

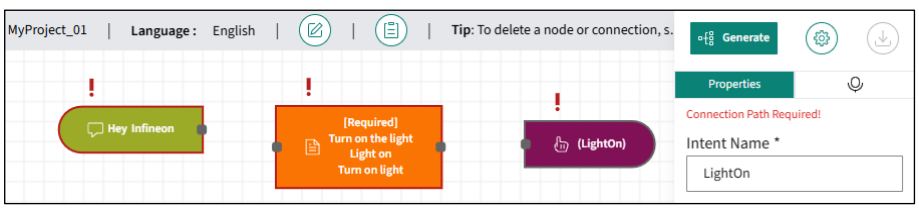


Next, drag a Text element onto the canvas, and enter **Text** phrases for it. For this example, we'll enter a few similar phrases that describe what we want the device to do, and press the **Enter** key for each one:

- Turn on the light
- Light on
- Turn on light

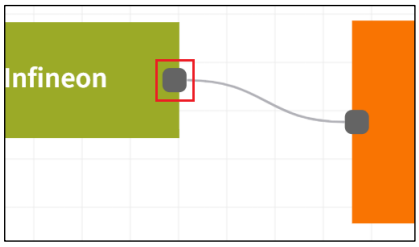


The last required element for this command set is an Intent. Drag that element onto the canvas, and enter an **Intent Name** for it, in this case "LightOn".



Note: The Variables element is optional, but can be useful for specifying specific locations, for example.

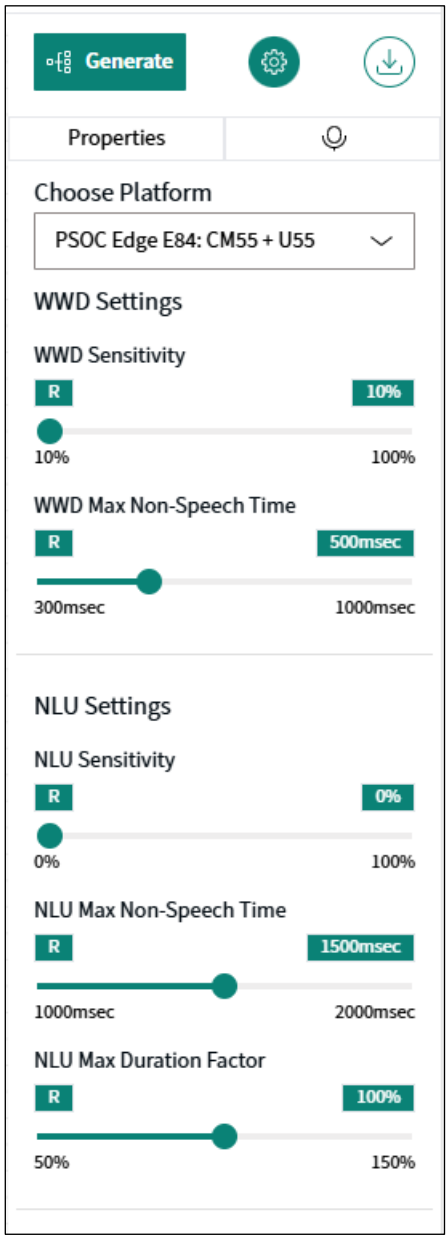
Finally, connect the elements by clicking on the grey end-node of the elements and dragging to the next node.



Repeat this entire process to add additional Wakeword, Text, and Intent elements to the model, such as "turn the light off", "dim the light down", etc.

3.3 Configuring the model

Once you have developed your model, configure it for the sensitivity settings that are appropriate for your use case. The available settings include WWD and NLU (command):



WWD Sensitivity

Configuration setting for the device permissiveness in detecting wake words. The higher the setting the more permissive the model will be in detecting wake words, and thus the higher percentage of false alarms (wake words that are not really wake words at all) will be detected. If you want to restrict your model to only triggering on the exact wake word created, set this configuration setting as LOW as possible.

WWD Max Non-Speech Time

This is the time allowed before the device will go back to looking for a wake word. Give the model enough time to detect the whole wake word, but not so much time that it holds off going into wake word detect mode.

NLU Sensitivity

This is the amount of permissiveness the model uses in detecting commands. The higher the sensitivity, the more likely the model is to choose a given command as a match. To avoid Out of Vocabulary matches (command matches that are not really matches at all), set this configuration option as LOW as possible. **Note**: This is basically the same case as for WWD Sensitivity above.

NLU Max Non-Speech Time

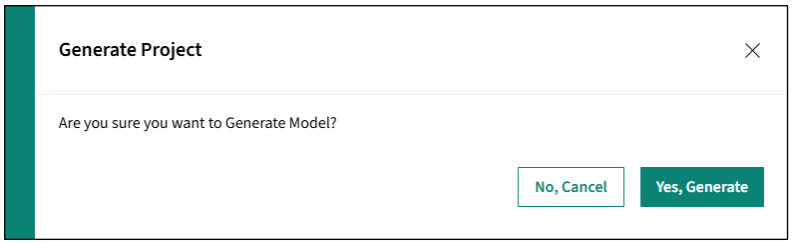
This is the amount of time that a gap is allowed in a command before the device rejects the command fragment and goes back to looking for a wake word. When the gap limit is reached, the command is considered complete and is sent for processing in the speech model.

NLU Max Duration Factor

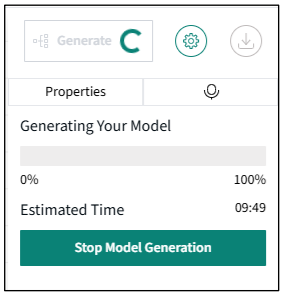
This is the length of time that a spoken command can go on for. If you have longer commands, set this to be higher. If you have short commands, then there is no need to have a long duration factor.

3.4 Generating the model

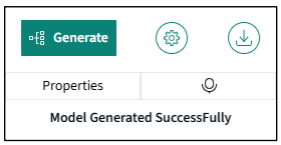
After you have entered all the various elements needed for the Model, click the **Generate** button to start the process. The following message displays to confirm you want to generate the model.



Click **Yes, Generate** to proceed. After a few moments, the page will display progress bar and a timer showing the estimated time it will take to complete the generation process.

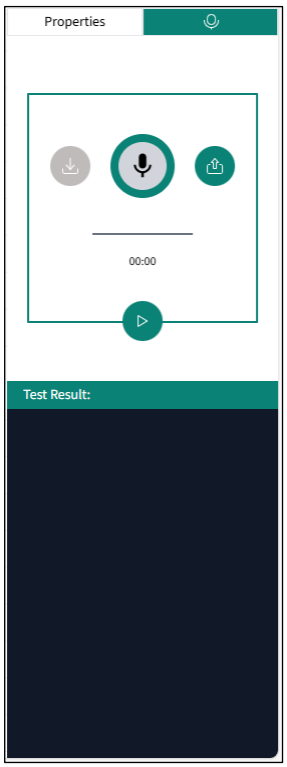


If for some reason you need to stop the generation process, click **Stop Model Generation**, and then you can update your design as needed. When the generation finshes, it displays a success message as follows:

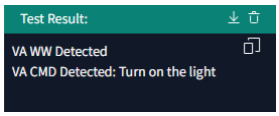


3.5 Testing the model in the cloud

After model generation is complete, you can test your model in the cloud using the **Test Audio Model** button. This shows the testing interface, where you can speak the Wakeword and phrases, or upload a .wav file with them, and the system will show you if they succeeded or not.

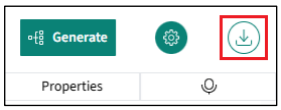


Click **Start Recording** and speak a Wakeword and one of the phrases you entered in the mode then click **Stop Recording**. The Test result shows messages that the Wakeword was detected and so was the command phrase.



3.6 Testing the model in an embedded application

In addition to testing in the cloud, you can download your model and test in an embedded application using a PSOC™ Edge development kit. Click the **Download from Cloud** button.



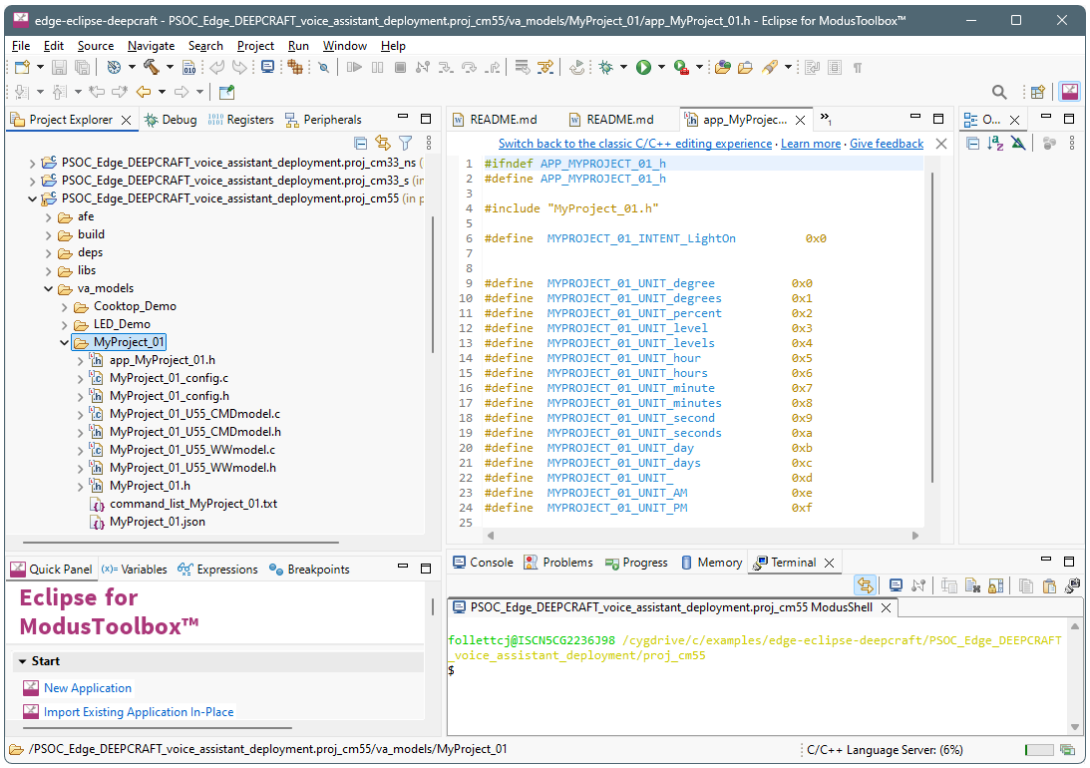
This will download a ZIP of your model onto your computer.

Create a ModusToolbox™ application using the PSOC™ Edge MCU: DEEPCRAFT™ Voice Assistant deployment template application. Refer to the code example README file here for details:

https://github.com/Infineon/mtb-example-psoc-edge-voice-assistant-deploy/blob/master/README.md

Getting started

After creating the application, extract the ZIP file into the CM55 project folder:



Then, go into the top-level application directory, and open the common.mk file. Change the value of the DEEPCRAFT_PROJECT_NAME variable. For example:

```
DEEPCRAFT_PROJECT_NAME=MyProject_01
```

Build and program the project onto your kit.

Follow instructions from the code example README file to test your model.

Revision history

Document revision	Date	Description of changes
**	2025-10-01	New document
*A	2025-12-15	Added section for configuring the model.

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