



ASSISTIVE CONTEXT-AWARE TOOLKIT (ACAT)

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VERSION 1.0.0

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1 ACAT Vision

1.1 How can I enable/disable ACAT Vision?

1. From **ACAT Dashboard** app, run **ACAT Config**.
2. Click on **Actuators**. A list of actuators is displayed.
3. Toggle the **Enable** checkbox to enable/disable ACAT Vision and click **OK**.

1.2 ACAT Vision uses cheek twitch as the trigger. How do I use the eyebrow raise gesture instead?

1. From **ACAT Dashboard** app, run **ACAT Config**.
2. Click on **Actuators**. A list of actuators is displayed.
3. Click on **Setup** for Vision Actuator.
4. In the dialog that is displayed, click on **Switches**. This displays the switches for ACAT Vision. Two entries are listed, one for **CT** (Cheek Twitch) and one for **ER** (Eyebrow raise).
5. Uncheck the **Trigger Select** for **CT** and check it for **ER**. If you want to use both as the trigger for selection, you may check both entries.
6. Click on **OK** and save the settings.

1.3 Can I use both cheek twitch and eyebrow raise as the trigger?

Yes you can. See question 1.2.

1.4 Can I use cheek twitch and eyebrow raise gestures in other ways?

Yes. You can map cheek twitch or eyebrow raise to a number of commands supported by ACAT. When you perform the gesture, ACAT will execute the command that is mapped to the gesture.

1. From **ACAT Dashboard** app, run **ACAT Config**.
2. Click on **Actuators**. A list of actuators is displayed.
3. Click on **Setup** for **Vision Actuator**.
4. In the dialog that is displayed, click on **Switches**. This displays the switches for ACAT Vision. Two entries are listed, one for **CT** (Cheek Twitch) and one for **ER** (Eyebrow raise).
5. If the **Trigger Select** is checked, the corresponding gesture will be used to select when triggered.
6. To map the gesture to a command, click on the **Map** button for the gesture.
7. From the list of command, select the one you want to map the gesture to.
8. Click on **OK**.
9. Click on **OK** to save the settings.

The next time you run ACAT, when you perform the gesture, ACAT will execute the mapped command.

1.5 Can I use ACAT Vision and an off-the-shelf switch simultaneously?

Yes you can. This gives you multi-modal interaction with ACAT. For instance, you can use the off-the-shelf switch as a trigger for selection and map cheek twitch or eyebrow raise to ACAT shortcuts. Refer to question 1.4 on configuring ACAT Vision and section 2 on using and configuring off-the-shelf switches.

1.6 ACAT Vision doesn't trigger. I goes into calibration mode frequently.

1. Make sure the face is positioned between 1-2 feet away from the camera.
2. During the calibration phase, try to keep as still as possible. Do not make any head or facial movements.
3. Face detection works well in most lighting conditions but if the room is too dark or (artificial/sun) light is shining directly on the face then face detection will work quite as well. Make sure the face is reasonably illuminated.
4. For gesture detection to work correctly, you must keep your head perfectly still and only move your cheek muscle, your mouth or your eyebrow.
5. To force recalibration while the video window is active, click on the window and press the 'r' key.

You may want to use **Vision Tryout** from **ACAT Dashboard** first before trying ACAT.

1.7 How can I show/hide the video window for ACAT Vision?

ACAT Vision video window is normally hidden while ACAT is running. You can display it by pressing **Ctrl+Alt+Shift+W**. To hide it, press **Ctrl+Alt+Shift+W** again. While ACAT is calibrating, you can press the **Show Video** button to display the window.

1.8 My system has multiple cameras. How do I select the one I want to use?

1. From **ACAT Dashboard**, run **ACAT Config**.
2. Click on **Actuators**.
3. Click the **Setup** button for the **Vision Actuator**.
4. Select **Cameras** from the dialog that is displayed.
5. From the drop down list, select the camera you want to use.
6. Select **OK**.
7. The next time you run ACAT, it will use the camera you selected.

2 Off-the-shelf switches

2.1 Can I use an off-the-shelf switch with ACAT? If so, which ones?

Yes, you can use off-the-shelf switches. They plug into your laptop through USB either through a switch box or directly. Here's how they work. You can configure them to send a keystroke whenever the switch is clicked. Some of them can send only a limited set of keystrokes such as ENTER or Spacebar, while others allow any keyboard sequence to be recorded and sent to the laptop. ACAT by default uses F12 as the trigger. You could configure the switch to send an F12 whenever it is triggered and the switch will work with ACAT.

A few off-the-shelf switch recommendations can be found at <https://01.org/acat/acat-using-shelf-switches>

2.2 My off-the-shelf switch doesn't support F12. How do I change the default trigger key from F12 to something else?

1. From **ACAT Dashboard** app, run **ACAT Config**.
2. Click on **Actuators**. A list of actuators is displayed.
3. Click on the **Setup** button for the **Keyboard Actuator**.
4. A list of keyboard shortcuts is displayed. There should be an entry for **F12**. Click on the **Change** button for this entry.
5. In the dialog box that displays, click in the shortcut box and press the key you want to use as the new trigger. You can also use a combination of **Ctrl**, **Alt** or **Shift** with your key.
6. Select the radio button "**Use as Trigger Select**".
7. Click on **OK**. This will return you to the previous dialog.
8. Click on **OK** and save the setting.
9. The new trigger key will be used the next time you run ACAT.

2.3 How can I use more than one switch?

If you have a switch box with multiple switches, you can configure each one of them to send a configurable keyboard sequence (such as F12, Alt-F12 etc) and then map each of these keyboard sequences to an ACAT shortcut.

Let's assume you have two switches – Switch1 and Switch2. Follow the instructions in the manufacturer's user guide for the switches and configure Switch1 to send an F12 and configure Switch2 to send Alt-F12. Now you have to configure ACAT to respond to F12 and Alt-F12.

Here is an example to use F12 as the trigger to select and to use the other switch to undo the last action. You can follow these steps to map the switches to other commands that ACAT supports.

1. From **ACAT Dashboard** app, run **ACAT Config**.
2. Click on **Actuators**. A list of actuators is displayed.
3. Click on the **Setup** button for the **Keyboard Actuator**.
4. A list of keyboard shortcuts is displayed. F12 is already mapped is already configured as Trigger Select.
5. Click on **Add New**.



6. In the dialog that is displayed, click in the shortcut box and press Alt F12. The box displays Alt+F12
7. Check the radio button **Map to a Command**.
8. Click on **Select Command** to display a list of ACAT shortcuts
9. A list of shortcuts is displayed with a description for each. Select the one you want to use, say, **CmdUndoLastEditChange**.
10. Click on **OK**.
11. Click on **OK** and save the settings.

Run ACAT. When you press Switch1, it should select the currently selected item. Type a letter and then autocomplete the word by selecting from the prediction list. Press Switch2. It should undo the auto-completion.


3 Text-to-speech

3.1 How do I convert text-to-speech with ACAT?

You can convert text to speech in one of two ways:

1. Display the Talk window by selecting the  button in the Alphabet scanner.
2. Type a sentence and select the **ENTER** button .
3. The text you just entered is converted to speech.
4. To repeat this, press the **ENTER** button again.

You can also use the **Phrases** tool to convert pre-configured phrases to speech. See section 5 for answers to questions on the **Phrases** tool.

1. From the ACAT Alphabet scanner, select the **Tools** button .
2. Select **Phrases**.
3. A list of phrases is displayed. Select the one you want and it will be converted to speech.

3.2 How do I select the gender of the text-to-speech voice?

Note: Changing the default text-to-speech voice will only work on Windows 8 and Windows 10. It may not work on Windows 7.

1. Run **ACAT Config** from **ACAT Dashboard**.
2. Click on **Text-to-speech**.
3. Click on **Setup for Speech Synthesizer TTS Engine**.
4. From the dialog that is displayed, you uncheck the **Select Voice** checkbox and select the gender.
5. Click on **OK** and save the settings.

3.3 How can I use a voice other than the ones that are bundled with Windows?

There are a number of text-to-speech voices you can purchase. Install them and follow these steps.

1. Run **ACAT Config** from **ACAT Dashboard**.
2. Click on **Text-to-speech**.
3. Click on **Setup for Speech Synthesizer TTS Engine**.
4. From the dialog that is displayed, you check the **Select Voice** checkbox and select the voice from the dropdown list.
5. Click on **OK** and save the settings.


Note: Changing the default text-to-speech voice will only work on Windows 8 and Windows 10. It may not work on Windows 7.

3.4 How can I disable Text-to-speech in ACAT?

1. Run **ACAT Config** from **ACAT Dashboard**.

2. Click on **Text-to-speech**.
3. Check **Enable** for **Null Text-to-speech Engine**.
4. Click on **OK** and save settings.

3.5 How do I edit/add/delete/re-order phrases displayed in the Phrases dialog?

1. From **ACAT Dashboard**, run one of ACAT Apps (**App QWERTY** or **App Abc**).
2. From the Alphabet scanner, select  to access the **Main Menu**.
3. Select **Settings**.
4. Select **Phrases**.
5. The **Phrases Editor** dialog is displayed.
6. To add a new phrase:
 - a. Select the **Add** button at the top of the dialog.
 - b. The **Phrase Editor** dialog is displayed. Activate your switch when the Phrase text box is highlighted. This will bring up the Alphabet scanner.
 - c. Enter your phrase and close the Alphabet scanner.
 - d. If you want this phrase to appear in the Phrase list in the ACAT Talk Apps, check the **Favorite** checkbox.
 - e. Select **OK** to save the phrase.
7. To edit an existing phrase, use the navigation buttons on the right to select the phrase to edit.
 - a. Select the **Edit** button at the top of the dialog.
 - b. The **Phrase Editor** dialog is displayed. Activate your switch when the Phrase text box is highlighted. This will bring up the Alphabet scanner.
 - c. Enter your phrase and close the Alphabet scanner.
 - d. If you want this phrase to appear in the Phrase list in the ACAT Talk Apps, check the **Favorite** checkbox.
 - e. Select **OK** to save the phrase.
8. To delete a phrase, use the navigation buttons on the right to select the phrase to edit. Select **Delete** from the buttons at the top of the dialog.
9. To re-order the phrase list:
 - a. Select the phrase you wish to move using the navigation buttons on the right.
 - b. Select **Move Up** or **Move Down** button at the top to move the phrase up/down the list.

3.6 Which phrases are displayed in the list in Talk (Abc) app?

The ACAT Talk app displays phrases marked as **Favorite**. Refer to the previous question on how to mark a phrase as **Favorite**.

3.7 In what order are phrases displayed in the Phrases dialog?

The Phrases dialog displays phrases in the order they were added or ordered in the **Edit Phrases** dialog. See question 3.5.

4 Scanners


4.1 The scanner is too big/small for my display. How do I change it?

You can change the size of the by using the following shortcuts on the Alphabet scanner (they will not work in other scanners):

1. Ctrl+Alt+Comma to make the scanner smaller
2. Ctrl+Alt+Period to make the scanner bigger
3. Ctrl+Alt+/ to restore it to its default size.

You can also resize the scanner from the ACAT Application.




1. From the Alphabet scanner, select  to access the **Main Menu**.
2. Select **Settings**.
3. Select **Size/Position**.
4. This will display the Alphabet scanner preview with a controller window that will let you set the zoom level using your actuator switch.

4.2 The scanning timing is too fast/slow. How do I change it?

Scanning speed is purely a function of how fast you can react and select the item when it is highlighted. A slow setting will slow down your speed of typing. If it is too fast, errors may result due to incorrect selection and you will spend more time undoing/correcting errors. The **ACAT Tryout** application is a good place to start. You can launch it from the **ACAT Dashboard** app. There are buttons there to increase/decrease the speed of scanning. Tryout various speeds until you find the speed that is most suitable. Press **Save** and exit ACAT Tryout. The speed you set there will be used in all the ACAT applications.


You can also control the scanning speed from the ACAT Application.



1. From the Alphabet scanner, select  to access the **Main Menu**.
2. Select **Settings**.
3. Select Scan.
4. It displays the scan timings used in various scanners. Set the values and save them.

4.3 How to I control the number of times ACAT scans?





1. From the Alphabet scanner, select  to access the **Main Menu**.
2. Select **Settings**.
3. Select Scan.
4. It displays settings for the number of iterations at the different levels – grid, rows and columns. Set preferred values and save the settings.

4.4 How do I hide the scanner window?

You can auto-hide the scanner window by setting the **HideScannerOnIdle** parameter. If this parameter is set to true, the ACAT scanners will auto-hide after a period of switch inactivity which is controlled by the **HideOnIdleTimeout** parameter (in milliseconds). When you active your switch, the scanners will automatically reappear.

1. Run **ACAT Config** from **ACAT Dashboard**.
2. Click on **General**.
3. Check the box against the **HideScannerOnIdle** parameter.
4. Set **HideOnIdleTimeout** to a preferred value. Default is 5 seconds.
5. Click on **OK** and save the settings.

4.5 How do I position the scanner at a different spot on the screen?

1. From the Alphabet scanner, select  to access the **Main Menu**.
2. Select **Settings**.
3. Select **Size/Position**.
4. The Alphabet scanner will display in the preview mode and a resize/reposition dialog will also display.
5. Select  in the dialog
6. The Alphabet scanner will be repositioned at different spots on the display. When it is at the desired spot, click your actuator switch.
7. Save the settings.

4.6 How do I prevent ACAT from automatically displaying contextual menus when I activate an app?

By default, when you activate an application like Windows Explorer, the Chrome browser, ACAT automatically displays the contextual menu for the application. You can selectively enable/disable this feature on a per-application basis.

1. From **ACAT Dashboard**, run **ACAT Config**.
2. Select **Applications**.
3. A list of ACAT agents for the different applications is displayed.
4. Click on **Setup** for the desired application(s).
5. Uncheck the check box for the parameter **AutoSwitchScannerEnable**.

5 Tools (Open File, Create File, Phrases, Launch App, etc)

5.1 From which folder does the Open Files in the Tools Menu display files? Can I change this?

By default, it looks at your **Documents** folder which is **C:\Users\<<userid>\Documents**. To change this:

1. From **ACAT Dashboard**, run **ACAT Config**.
2. Click on **Tools**.
3. Click on **Setup** for **File Browser**.
4. Set the **FavoriteFolders** parameter to a semi-colon delimited list of folders. You can use the **@MyDocuments** macro to indicate your Documents folder (which is c:\users\<<your userid>\Documents). For example:
C:\Personal\Files;@MyDocuments\Docs;C:\Docs
5. Click on **OK** to save the settings.

5.2 How do I exclude certain types of files from displaying in Open Files.

1. From **ACAT Dashboard**, run **ACAT Config**.
2. Click on **Tools**.
3. Click on **Setup** for **File Browser**.
4. Set the **ExcludeFileExtensions** parameter to a semi-colon delimited extensions with wildcards. For instance, if you want to eliminate JPG and PNG files, set this to *.jpg;*.png,
5. Click on **OK** to save the settings.

5.3 In which folder does Create File in the Tools Menu create files? How do I change it?

By default, it creates files in your **Documents** folder. To change this:

1. From **ACAT Dashboard**, run **ACAT Config**.
2. Click on **Tools**.
3. Click on **Setup** for **File Creator**.
4. Set the **NewTextFileCreateFolder** parameter to the folder where you want to create text files. Set the **NewWordDocCreateFolder** parameter to the folder where you want to create Word documents
5. Click on **OK** to save the settings.

5.4 How do I edit/add/delete/re-order phrases displayed in the Phrases dialog?

See question 3.5.

5.5 Which phrases are displayed in the list in Talk (Abc) app?

See question 3.6.

5.6 In what order are phrases displayed in the Phrases dialog?

See question 3.7.

5.7 How do I edit the list of apps in the Launch App tool?

1. From **ACAT Dashboard**, run **ACAT Config**.
2. Click on **Tools**.
3. Click on **Setup** for **Application Launcher**.
4. A list of apps is displayed. Click on **Change** to edit app info.
5. To add a new app to the list, click on the **Add New** button and enter the app info.
6. Click on **OK** to save.