

Unity UI Toolkit Guide

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Canvas

The canvas is where most of the UI elements in the game appear. It is rendered on a separate (UI) layer from the game and can either overlay the game or be rendered by the camera.

Canvas

Render Mode: Depicts how the Canvas is rendered when the game is played.

- By default, the canvas appears as a massive rectangle that is overlayed onto the camera but is not affected by the resolution of the game screen, so elements may appear off screen depending on the screen space.
- The next setting is “Screen Space – Camera” which scales the canvas to the view of the provided camera. This ensures that all elements appear on screen regardless of resolution.
- The final setting is “World Space”, where the canvas physically occupies a space in the scene, and is not constrained to any camera, nor is it affected by the movement of the player.

Pixel Perfect: Forces elements in canvas to be aligned by pixels if Render mode is set to screen space. This setting can make elements appear sharper and prevent blurriness, however if the element is scaled or rotated, this setting will make the animation appear less smooth.

Sort Order: The layer in which you want the canvas to appear. Can be used to make the canvas be in front of all other GameObjects in the camera view or, in some cases, can also be used to allow some GameObjects to appear on top of the canvas and cover the view.

Target Display: Which monitor/display the canvas appears on. Supports up to 8 monitors

Canvas Scaler

UI Scale Mode: Depicts the scale used for how the Elements adjust to fit the UI

- Constant Pixel Size is the default, when the canvas is scaled down when the game is ran, the pixel ratio of UI elements will stay the same, regardless on the resolution of the players screen
 - **Scale Factor:** Scales all UI elements on the canvas by this factor
 - **Reference Pixels Per Unit:** How much one pixel covers a unit of the UI
- **Scale With Screen Size:** The canvas scales based on the size of the users screen, similar to the camera overlay from earlier, but without the need of specifying a camera
- **Constant Physical Size:** Similar to WorldSpace, but would still be attached to a camera, but the size it is on the scene is the size it is on the players screen

Graphic Raycaster

Has a default Unity script already attached.

Ignore Reversed Graphics: Graphics facing away from the raycaster (out of view) are not rendered unless this is unchecked.

Blocking Objects: Type of objects that will block the raycasts. Options are: None, all 2D, all 3D, or both 2D and 3D

Blocking Mask: Layers/Masks that will block raycasts

EventSystem

The EventSystem is spawned by the Canvas, and is used to detect input to the elements within the canvas.

Event System

This component allows for modification to the initial state of the EventSystem.

First Selected: When set to an instance of a GameObject, this object will be selected upon instantiation of the canvas.

Send Navigation Events: When checked, this allows for navigation of the UI using directional input, and selection/cancellation with button input (i.e. RETURN and ESC). The Standalone Input Module is key to this.

Drag Threshold: An integer value that changes how far an input has to go in pixels before it is counted as a “drag” rather than a press. Defaults to 10 pixels, meaning if, for example, the mouse is pressed and moved 9 pixels, it will count as a press, but if it is moved 10 pixels, it will count as a drag.

Standalone Input Module

This is used to allow inputs to the canvas, with fields that change based on the Input Manager.

Horizontal Axis: This field is where the Input Manager’s name for the horizontal axis goes

Vertical Axis: This field is where the Input Manager’s name for the vertical axis goes

Submit Button: This field is where the Input Manager’s name for the submit button goes

Cancel Button: This field is where the Input Manager’s name for the cancel goes

Input Actions Per Second: A float that limits how many inputs can be done per second.

Repeat Delay: A float that limits how long until a repeat action can be taken (by default, an action can’t be repeated until half a second has passed).

Force Module Active: A checkbox that forces the Standalone Input Module to be active when checked.

Dropdown

Canvas Renderer

The CanvasRender contains the setting to use the Cull Transparent Mesh which determines if the shape of the renderer can be ignored under certain conditions.

Image

The image contains settings that determine how it is displayed when rendered.

Source Image: The original sprite used in drawing the dropdown. Split into 9 segments so the dropdown can be resized.

Color: The color of the dropdown.

Dropdown – TextMeshPro

The Dropdown – TextMeshPro component contains settings that determine if the user can interact with the dropdown, as well as other settings such as the target object, the options included in the dropdown, and the template to be used when the dropdown is opened.

Interactable: a boolean to determine if the player can open the dropdown.

Navigation: This determines the ways that the dropdown can be used to navigate throughout the game.

Template: This determines the visual template to be used when the dropdown is opened.

Caption Text: This contains the text object to be used when displaying the selected option when the menu is closed.

Caption Image: This contains the image object to be displayed if the selected option contains a sprite.

Placeholder: This contains the text to display when no options are selected.

Item Text: This is the text item for the label of each item within the template.

Item Image: This contains the image object to be displayed by each item in the template.

Value: This is the value of the selected option within the dropdown menu.

Alpha Fade Speed: This is the speed that the dropdown fades in and out of the UI.

Options: These are the options to display within the dropdown when it is opened.

On Value Changed: These are the methods to call when a new option is selected within the dropdown.

Label

The label is spawned by the Dropdown and displays the selected option within the dropdown.

It contains a Text Mesh Pro component which displays the selected option's text and has settings to change how the text is displayed.

TextMeshPro – Text (UI): The TextMeshPro object where the text for the label of the dropdown is put.

Arrow

This allows the user to open the dropdown menu. It contains an arrow image that when clicked opens the dropdown menu.

The image contains settings that determine how it is displayed when rendered.

Image: The image containing the sprite & the image information for the dropdown arrow (rendered on the right side of the dropdown by default)

Dropdown List

Spawned by the Dropdown when it is clicked. The Dropdown List contains all of the UI elements to be displayed for the options within its Options field.

Image: The image containing the sprite & information for the expanded dropdown list.

Scroll Rect: The scrollbar for longer dropdown lists; includes options for how the scrolling responds

- Horizontal: Checkbox that enables horizontal scrolling
- Vertical: Checkbox that enables vertical scrolling
- Movement Type: The movement type of scrolling
- Inertia: Checkbox that enables scrolling inertia
- Deceleration rate: Float for the deceleration rate of inertial scrolling
- Horizontal Scrollbar: Stores a GameObject reference to a scrollbar, null by default

Viewport

Spawned within the Dropdown List. The Viewport is where the options within the dropdown can be seen.

Image: The image containing the sprite & information for the viewpoert (empty image by default)

Content

Spawned within the Viewport. The Content defines the bounds of the Viewport.

Item

Spawned within the Content object. The Item defines the UI to be displayed for an individual option within the dropdown.

Toggle: Stores information about how users can interact with the item

- Interactable: Checkbox that determines whether the item is interactable
- Transition: The visual effect of clicking on the item
- Navigation: Used for input navigation of the menu (i.e. arrow keys)
- Group: ToggleGroup for when the item is pressed

Scrollbar

The Scrollbar is displayed if the size of the viewport is not large enough for all of the options within the dropdown to be displayed. It allows the player to scroll within the dropdown to see all of the options available.

Image: The sprite for the scrollbar. Split into 9 sections for resizing.

Scrollbar: Handles the scrolling.

- Interactable: Checkbox that determines if the scrollbar can be interacted with
- Transition: Visual effect of clicking on the scrollbar
- Navigation: Dropdown that decides which type of navigation the scrollbar does (i.e. horizontal, vertical, automatic, etc.)
- Direction: Which direction the scrollbar goes
- Value: The default value (i.e. distance scrolled) on startup between 0 and 1
- Size: The size of the scrollbar between 0 and 1

Blocker

Spawned by the Dropdown when it's clicked. The Blocker prevents users from clicking on anything besides the Dropdown while it exists.

Image: The sprite for the blocker, contains no image by default

Button: The button for the blocker