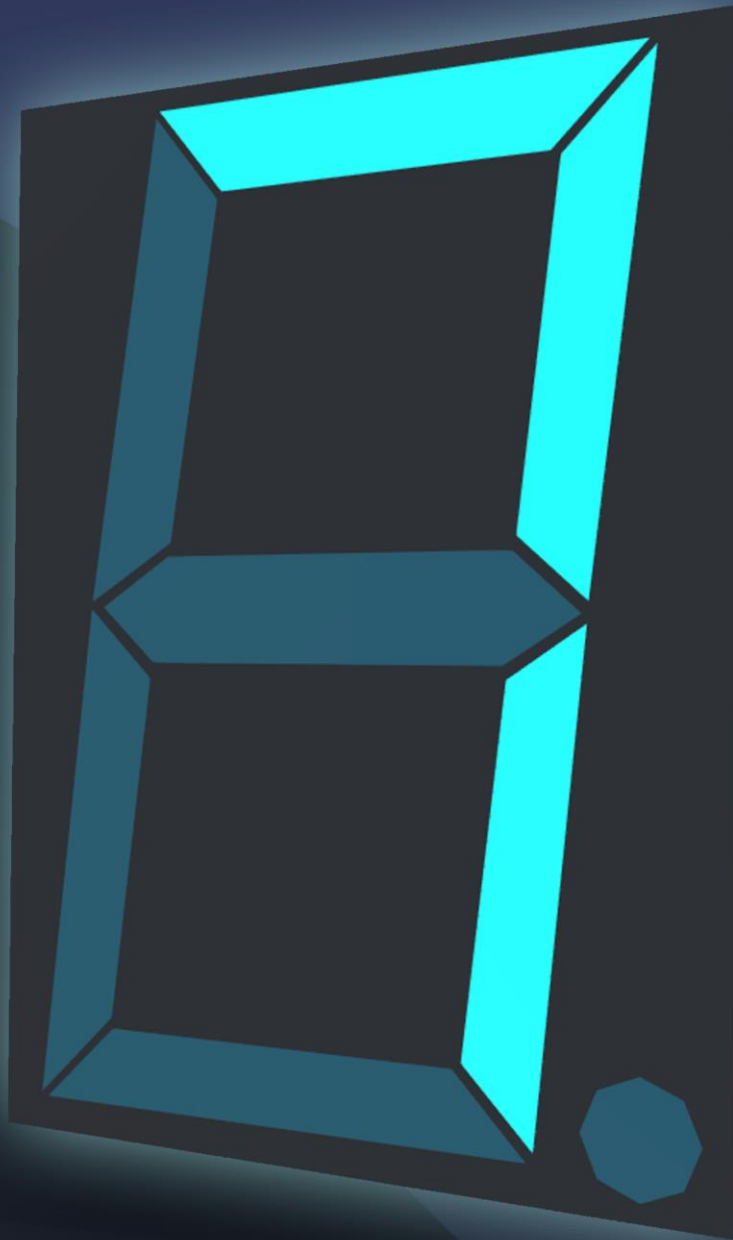# Oclanay™ LED Display Series

For Unity Engine 5.6+ or 2017.3+

Version 1.0.0 | May 2018
**CYB CHEBRYNHITTE**



# Basic Seven Segment Display

Reference Manual

2018 Year of Caladradanathar

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## FOREWORD & WELCOME

I bring warm greetings to you from City of Sydney in the Commonwealth of Australia. Again in 2018, I am proud to deliver another quality product on behalf of all indie and professional developers alike of virtual reality.

With so much choice available among so many assets imaginable, and even with segmented display LEDs and the like, my purpose is not to make head-to-head competition, but to augment the competition, by alongside comparable products to bring flexibility and alternatives to your projects.

We all know that finding a one-size fits all solution cannot cover all facets of your needs at any one time, and that several global solutions are sometimes needed to bring a world to completion. Sometimes using a similar product for mobiles vs desktops is needed, and this product is no exception. There are several product alternatives on the market which I encourage you to review from other suppliers and authors. Certainly, I am proud to follow my personal passion in providing you with further alternatives to satisfy the various needs of your project.

I welcome you to our forums to leave feedback. I do not know everything in this deep world of VR, and wish to never do so, but to grow and learn from the wonderful community and our valued customers alike. Quality is an ongoing journey, and knowing it all would mean it comes to an unexpected end, something which I promise not to let happen.

I hope that this free and basic seven segment display unit will find its way into many of your projects, driving appliances or counters, score boards or watches, and that it may appear alongside your future AAA titled games!

Once again, I wish you good speed and development with this Segmented Display Unit, and I welcome you aboard our product suites. Thank you and welcome.

Kindest Regards,

Christian Kanakis
V | Caladradanathar

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## INTENDED AUDIENCE

It is assumed that the user has basic exposure and a familiar understanding with the Unity Engine software platform prior to using this product. Programming experience is not required to use the displays.

## INSTALLATION

Unpack the the unitypackage into your project. It will create an Oclanay/BasicSevenSegmentDisplay folder which contains the product.

## REMOVAL

Delete the Oclanay **BasicSevenSegmentDisplay** folder inside the Content folder under the Oclanay folder. If you do not have any other Oclanay products residing under this folder, you may delete the Oclanay folder as well.

## PRODUCT INSTALLATION VERIFICATION

Navigate to the Oclanay/BasicSevenSegmentDisplay/Scenes folder and load the **Demo** scene. After pressing PLAY, you should see a pair of LEDs changing every second between random numbers. Decimals are randomly activated as well.

## UPDATING TO LATER VERSIONS

If you are installing a later version of the product from a unitypackage archive, you may overwrite a pre-existing version already installed for your project. Please be aware that any changes you have made to the product will be lost, unless the Oclanay/BasicSevenSegmentDisplay folder is backed up first.

# SECTION 1: DISPLAY SUMMARY

## RUNNING, DEPLOYING AND VIEWING

After the relevant actors have been placed in the scene and configured as needed, the Play button can be pressed to preview the devices in operation. The Demo scene can be used to test drive the product.

## PERFORMANCE CONSIDERATIONS

The device consumes little in the way of resources. Chief among Oclanay™ products are optimisations that may be enabled as required to improve your scenes performance should the need arise. There are no optimisations available for this particular product. Given the simplicity of this device, there are not any expectations that this device used in large numbers will have a significant performance impact.

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# SECTION 2: DISPLAY DETAILS

## DISPLAY PROPERTIES
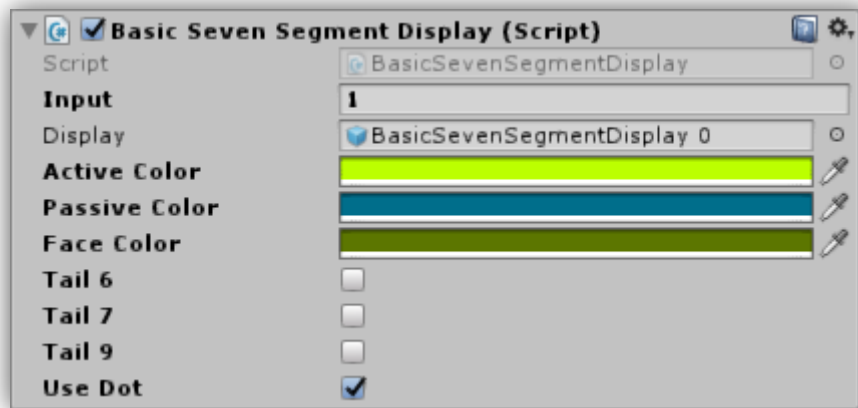


Simply drag a BasicSevenSegmentDisplay prefab found in the *Oclanay/ BasicSevenSegmentDisplay/Prefabs* folder onto the active viewport in the editor and press F to focus on it. You should see a blank display. The instantiated game object will have the default settings as per table below.

| Feature | Default Setting | Description |
|---|---|---|
| Input | Blank | The figure to show on the display. |
| | | Note: The mapping may be changed in the BasicSevenSegmentDisplay.cs script under the Convert() method. Limited C# experience is needed to adjust the mapping. |
| Display | Default | The display |
| Active Color | White | The active and emissive color of the LED. |
| Passive Color | Dark Grey | The inactive and non-emissive color of the LED. |
| Face Color | Black | The surrounding color of the display panel/face. |
| Tail 6 | Unchecked | Whether to show the tail of the 6 figure. |
| Tail 7 | Unchecked | Whether to show the tail of the 7 figure. |
| Tail 9 | Unchecked | Whether to show the tail of the 9 figure. |
| Use Dot | Unchecked | Whether to use the decimal point or otherwise. |

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## THEMING & APPEARANCE

Using a popular 3D editor such as Blender, you can modify the shape and style of the LEDs, Face and Decimal Point. This product does not offer any pre-made schemes of any themes, but the simplistic nature of the displays makes it easy to adapt to a variety of segment shapes and styles.

## EXTENDING FUNCTIONALITY

The BasicSevenSegmentDisplay class may be extended to introduce additional functionality that the basic display might not cover. Simply extend a C# class from the BasicSegmentDisplay class and add additional methods and fields as required. Select methods may be overridden as needed. Please refer to the API Reference for further details on the methods that can be overriden.

## API REFERENCE

The following API Table may be used in by any game object to allow your scene elements to engage with the LED units you are using in your scene.

| Method Name | Signature | Description |
| --- | --- | --- |
| **Set Data** | void SetData(int number), void SetData(char character) | Sets the display character based on either a number or character entered as an argument to the method. The figure will show itself on the next frame update. |
| **Set Dot** | void SetDot(bool usedot) | Sets the dot on or off if the Boolean value is true or false respectively. The dot will change on the next frame update. |
| **Convert\*** | int Convert(char character, bool tail6, bool tail7, bool9) | Converts a character into a binary value represented as a decimal number. Please refer to the *Binary Format* topic on a more detailed explanation of the binary code format as a decimal number using a character input as a source figure. This method can be overridden in derivative classes. |
| **Clear Display** | void ClearDisplay() | Clears the display and the dot – all segments including the dot are switched off. The effect will come through on the next frame update. |
| **Set Passive LED Color** | void SetPassiveLEDColor(Color color) | Sets the color of the switched off LED. The color is not emissive. |
| **Set Active LED Color** | void SetActiveLEDColor(Color color) | Sets the color of the switched on LED. The color is emissive. |
| **Set Face Color** | void SetFaceColor(Color color) | Sets the color of the display panel (or face) of the display. |
| **Render Display\*** | void RenderDisplay(Char character) | Renders the material across all LEDs and the dot polygons in accordance with the _Input state after conversion to its binary representation. This method can be overridden in derivative classes. |

*\* Protected virtual methods – documented for reference.*

# SECTION 3: ADVANCED FEATURES

## TEXTURES

There are no textures with this product, but there are two materials: one for the face and the other for the LED. The latter represents the on and off states of all segments including the dot. The latter is controlled by the RenderDisplay() method where the emissive or otherwise rendering state of the material is adjusted accordingly.

**Oclanay™** will not provide support for texture modifications or any PSD source files. Modifications to the textures are done at the operator's risk. However, this reference manual can provide a guide as to how the textures may be modified to suit your needs. It is recommended that Adobe® Photoshop™ be used when modifying the textures. Please backup the textures before altering the originals.

## SCRIPTED INTERFACES

This product does not support interfaces in its operating architecture at time of publication (v1.0.0). However, the BasicSevenSegmentDisplay class may be extended by custom C# code if additional functionality is required for your projects.

## BUILDING & PACKAGING

Your project may be built with the Display installed within your project. Oclanay™ cannot provide any support around the building and packaging process. Please be advised that any third-party plugins you have may prevent building from working, particularly if they are written in unmanaged C++ code for specific platforms.

As this product is not a plugin, Oclanay™ does not expect that there will be any issues around building your project. The build testing assumes your project only has this product installed on its own as a test reference. Oclanay™ cannot imply nor make any representation as to the guarantee that this will work for your project.

This product should compile in the Unity Editor for most popular target platforms. It has been tested to compile for Android (Android SDK versions 21 and over), HTML 5 based web browsers, and for Windows x64 at time of release of version 2017.3 and 5.6.2.

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## BINARY FORMAT

The Convert function takes a character and converts it to a decimal number. The decimal number controls the figure but not the decimal point.

The pattern of the number in binary corresponds to a segment. The number returned by the Convert function expresses how the LED will be lit. Each LED is assigned a letter from a to g. The diagram below illustrates this.
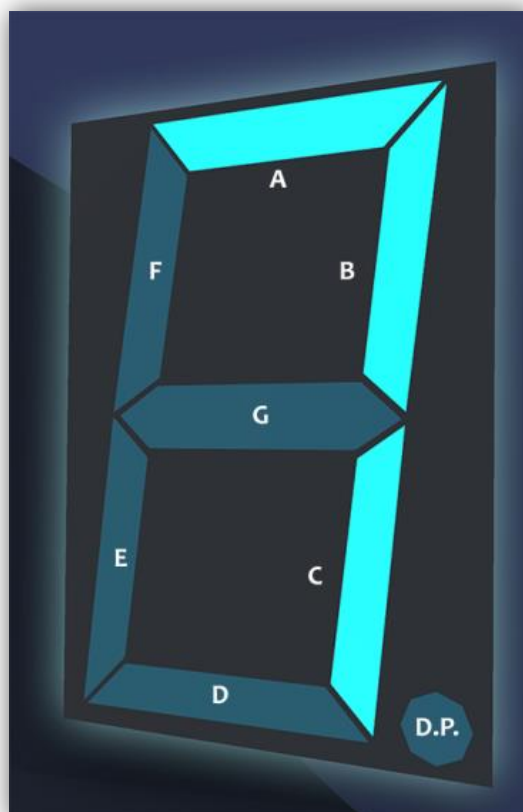


The binary pattern of any returned number is arranged in such a way that the least significant or right most bit represents the 'a' segment. The second right most bit represents the 'b' segment and so on until the middle segment denoted 'g' represents the left most or most significant bit. If the bit is a zero, the LED is switched off. If the bit is a one, the LED is switched on. The bit can only assume two values 0 and 1 and no other.

Please visit www.oclanay.com and proceed to the tools menu to view a variety of aides that will assist you in authoring your own character-to-binary mapping. To make the mapping possible, you will need MonoDevelop or Visual Studio installed so that compilation can be performed in Unity. You will need to modify the mapping in the Convert function to effectuate custom mappings.

An example: The number 5 is represented as 1101101 which is decimal 109. The last figure '1' represents the 'a' LED whilst the first figure '1' represents the G led. The D.P (Decimal Point) is controlled separately through the property inspector.

# FAQ

1. **Will this work in 2D mode?**

   Yes, the device is effectively planar, so it will render reasonably well in 2D space. Please bear in mind the product is primarily designed for a 3D environment. It does not use any Unity UI technology nor object code, though it might be useable in the context of a UI system based on user experimentation.

2. **Will this product work on mobile devices?**

   Yes, the scenes containing the devices should work on a broad range of desktop and mobile devices. Please visit www.oclanay.com for further details.

3. **How much support entitlement is available?**

   Typically, this is limited to 1 hour for technical support or the reporting and resolution of product defects per customer.

4. **Can the Display be driven by an external data source, API, web service or third-party system?**

   Yes, any documented exposed inputs via the BasicSevenSegmentDisplay class written in C# may be used to drive the display. Feeds from web services for instance could be used to populate the display if the product is used in say, real-time timing applications or other similar functions.

5. **Will this product work over a network game or networked environment?**

   If the project or game using the product is designed to be played in multiplayer mode, the product should work over the networked environment without issue. Oclanay™ cannot provide support for networking issues encountered when using this product.

6. **How much system resources will a set of signs consume?**

   Very little system resources are consumed. The assets included in this product are appropriately sized, scaled and trimmed. The geometry is highly simplified.

7. **Can this product be used in games, media, or movies when using the advertisement engagement capabilities for making revenue?**

   Yes, this item is completely free and may be used for person or commercial use, with or without profit. Please contact support@oclanay.com for further details.

# SUPPORT AND CONTACT INFORMATION

Core product and community support can be found on the **Oclanay™** website and forums at https://www.oclanay.com and https://support.oclanay.com respectively. Sign up is free and support staff can provide you feedback within 48 hours of posting questions. Customers are invited to openly share and exchange ideas and feedback with **Oclanay™** and other developers and customers for product operation. You can also view the known issues thread at https://support.oclanay.com under the relevant title on the support forum.

Support tickets can be raised for technical issues, but cannot answer questions about integrating projects with the displays and use cases similar thereof. Bugs and other defects are welcomed feedback which we encourage reporting. We will endeavour to prioritise critical and high priority fixes as necessary.

Sales questions or ancillary information about this product may be emailed to support@oclanay.com. Telephone, video support and live chat are not available.

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