Virtuoso Standard Library 1.0.0

Analog Gauge

An analog gauge is an instrument that can measure and display certain dimensional information. Analog gauge have a needle that directly responds to changes by pointing to numbers on a scale corresponding to the input sensed by the measuring element. Movement of the needle translates to variations in input values, which are easily noticed and monitored.

1. Different type of Tick values scales

Case 1: Default setup

(A)Default Node Style

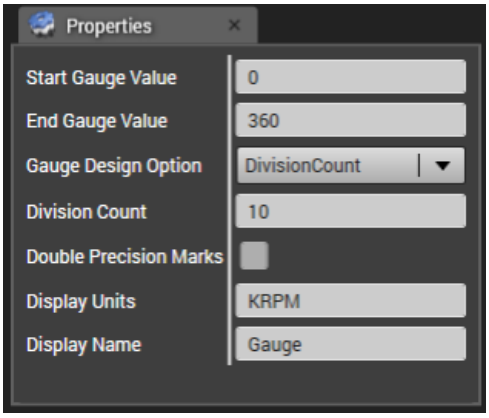
(B) Default Property window

Initial Properties meaning are as follows:

Initial Properties of analog gauge are as follows:

Start Gauge Value: It is used to define the initial scale value
End gauge Value: It is used to define the final scale value
Gauge Design Option: It is a dropdown which is used to set scale in three different ways. These options are "List", "Dictionary" and "Division Count"
Double Precision Marks: If it is checked then scale values will have decimal form otherwise Integer form

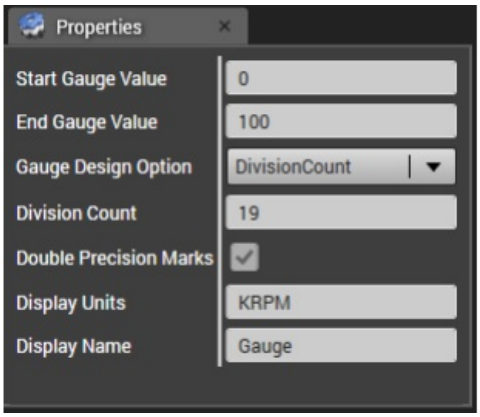
(I) Default Property window



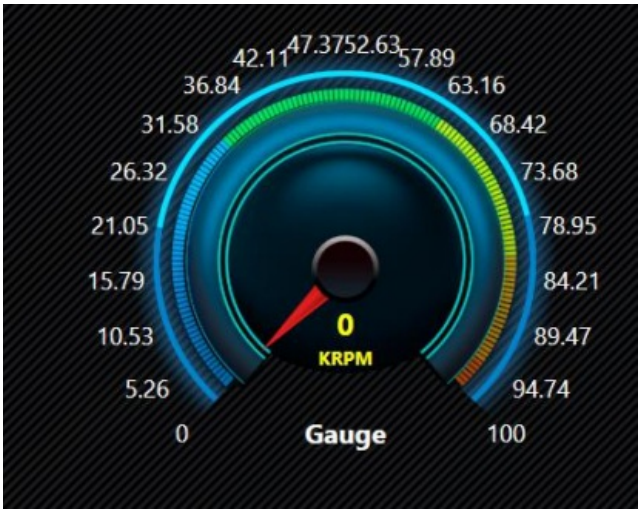
(II) View in Host

- **Display Unit:-** It represent Unit of scale.
- **Display Name:-** It can be used to define Name of the control.

(C) Preview Window



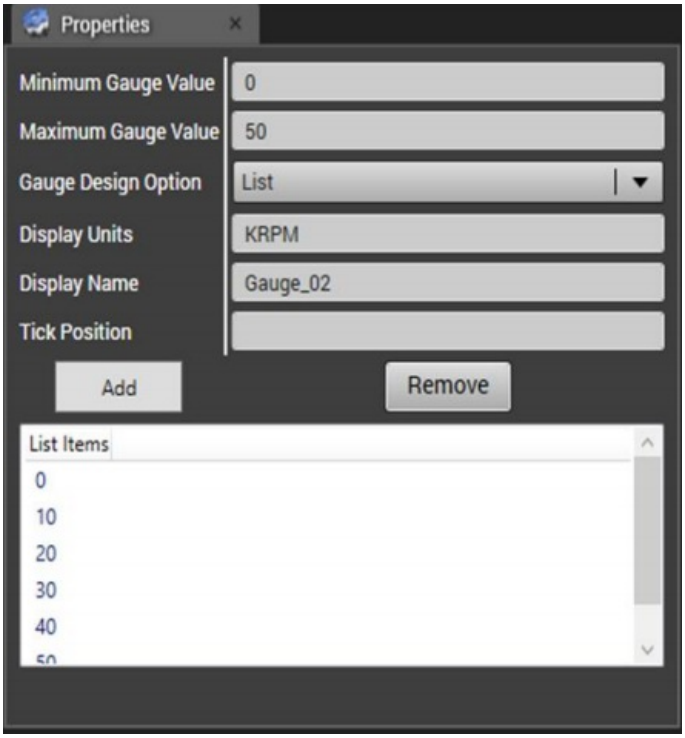
(D) Default View on HOST



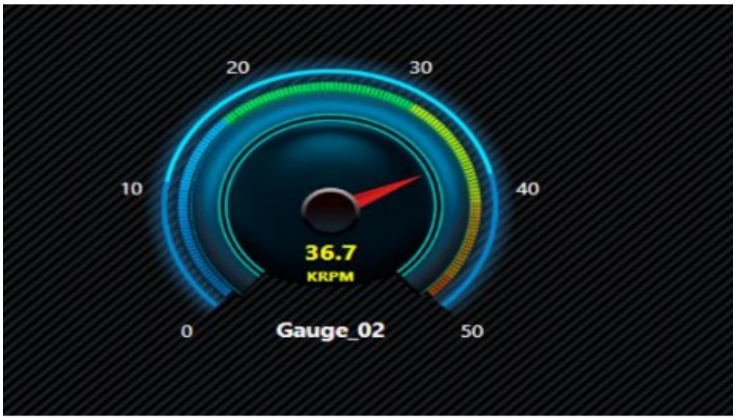
Case 2:-Changing “Gauge Design Option” from dropdown

Case (I) when selected option from “Gauge Design Option” dropdown is “List”

1. Property Window



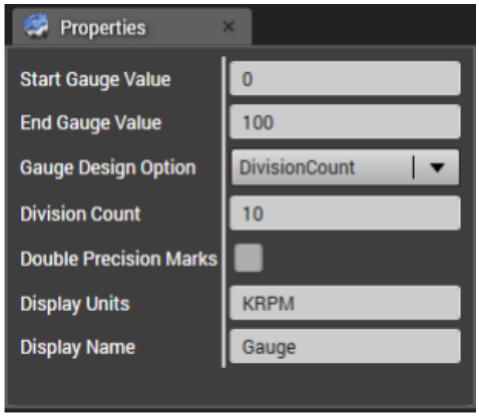
2. View on HOST



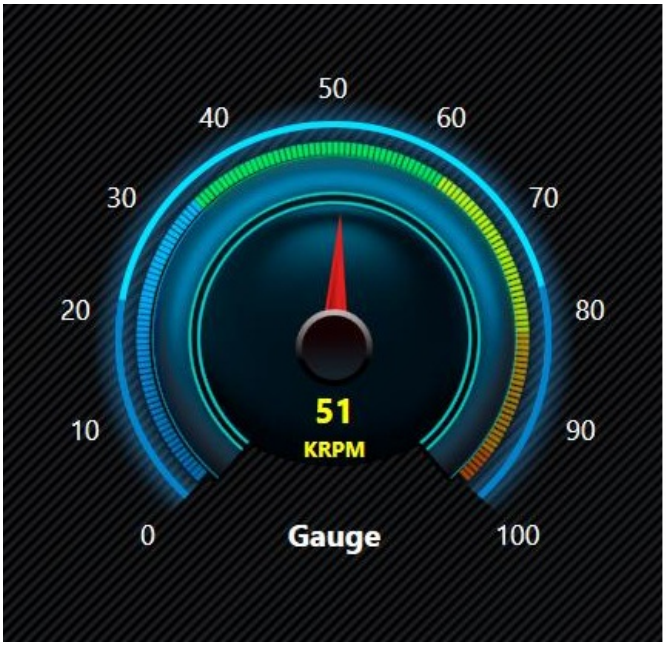
Case 3:-Different Tick values scale

1. When Tick value scale like(0 To 100)

1. Property window

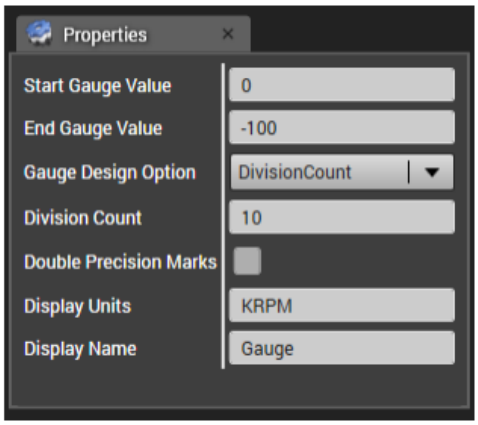


2. View in HOST

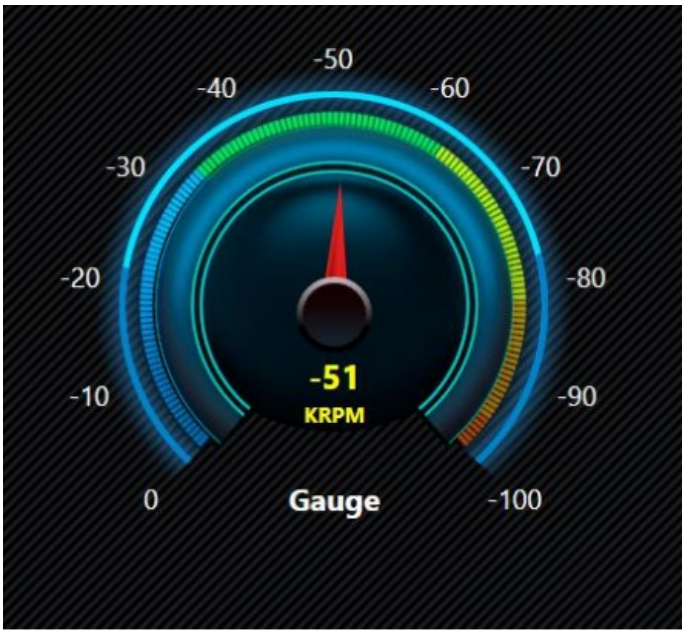


2. When Tick value scale like(0 To -100)

1. Property window

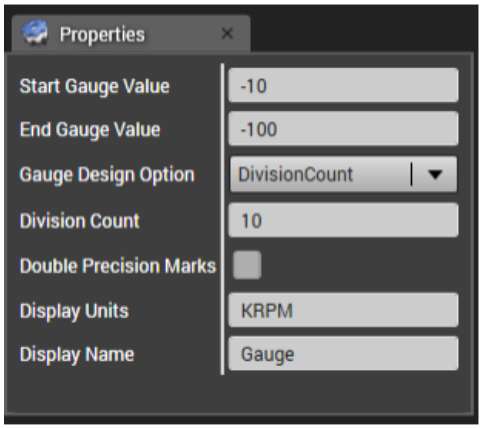


2. View in HOST

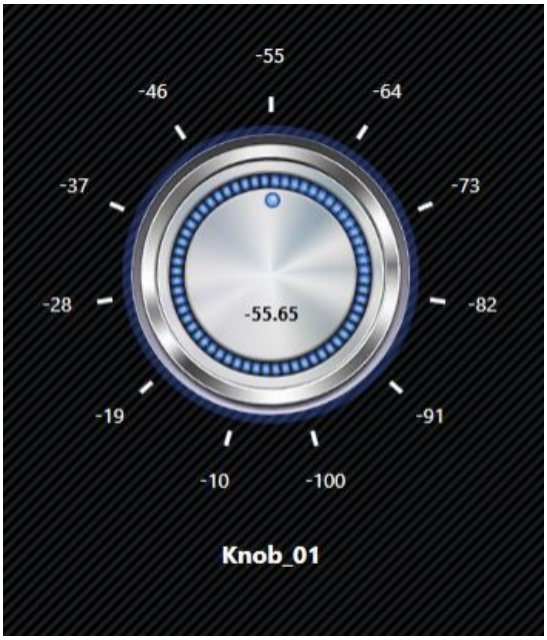


3. When Tick value scale like(-10 To -100)

1. Property window

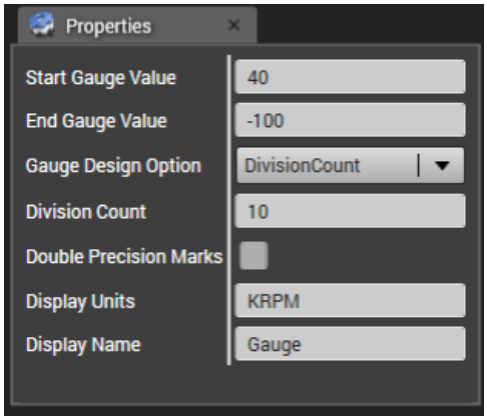


2. View in HOST

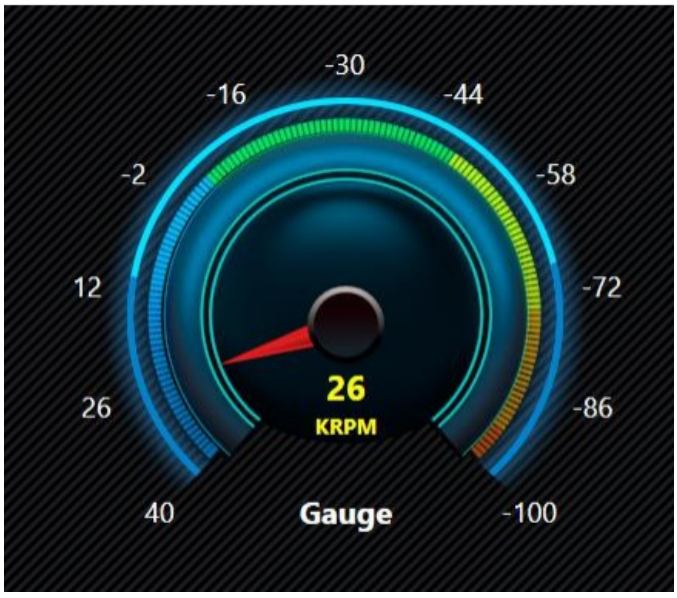


4. When Tick value scale like(40 To -100)

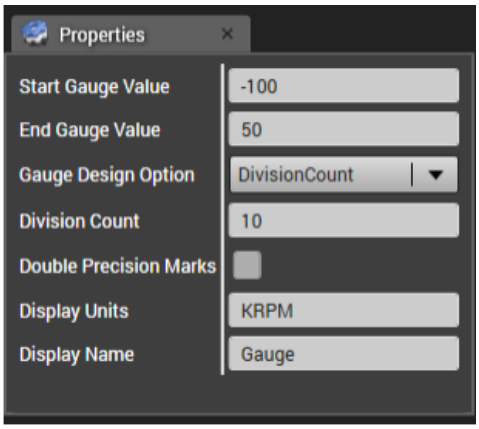
1. Property window



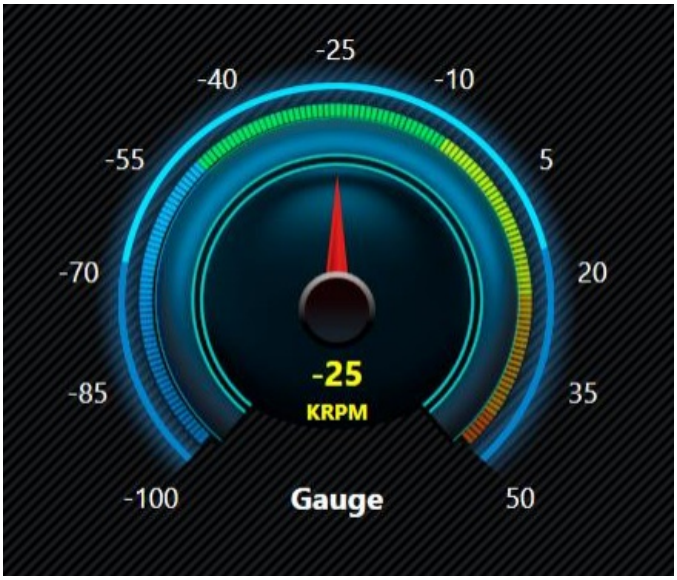
2. View in HOST



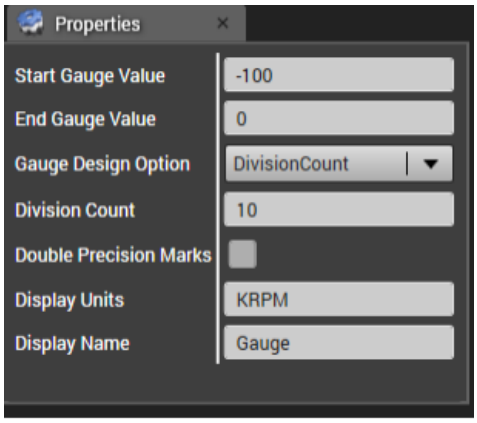
5. When Tick value scale like(-100 To 50)
1. Property window



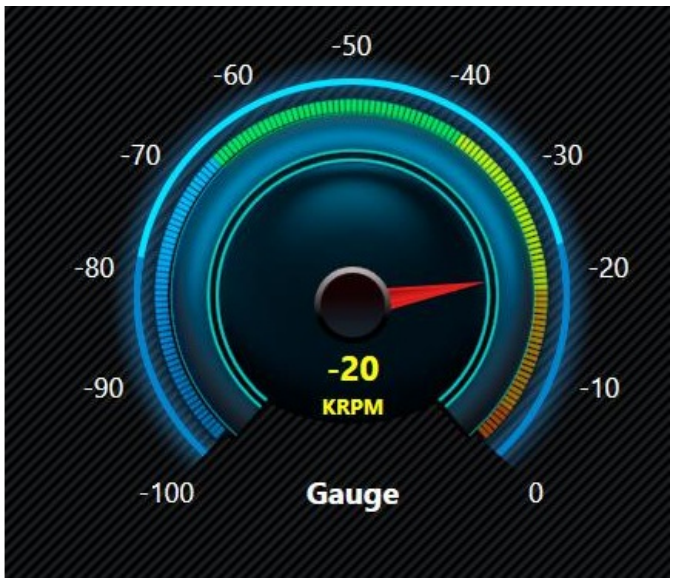
2. View win HOST



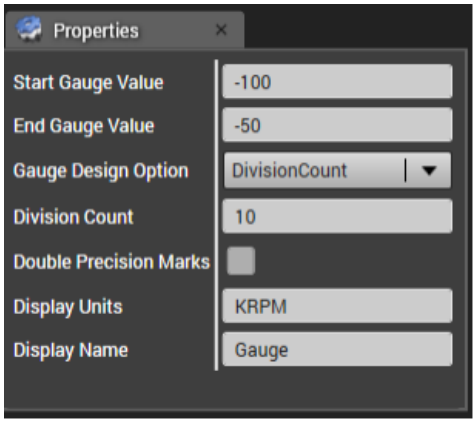
6. When Tick value scale like(-100 To 0)
1. Property window



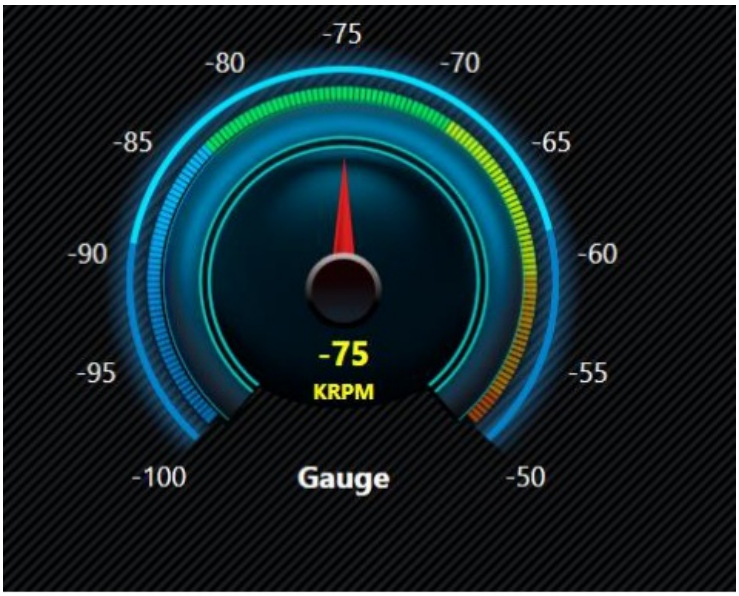
2. View in HOST



7. When Tick value scale like(-100 To -50)
1. Property window



2. View in HOST



Note:-It also persist the state on HOST end. It will also maintain last state of itself whether it is connected with any control or not. if on an initial stage, it is connected with any control and again if the same control is disconnected, still it will maintain its last value.

Command Panel

The Command Panels provide a graphical means of accessing almost all of the linear functionality. The main Command Panel is divided into six modes. Each of these modes pertains to a major component of the linear application. To view information about each of the tools in the Control Panel select the help icon on each panel to access context specific help.

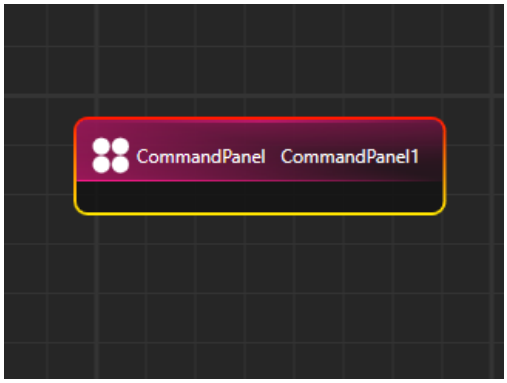
The Classic look includes rows of buttons with icons. The hierarchy is entity-based. Geometric, mesh, and other entity types are the focus of the hierarchy. A user navigates entity types then selects actions to perform on those entities.

All command panels are constructed similarly. Each panel represents one or more linear commands. Options are selected using check boxes, radio buttons, combo boxes, edit fields, and other standard GUI widgets. Each command panel includes an Apply button. Pressing the Apply button will generate a command to Cubit. Nothing happens until and unless the Apply button is pressed.

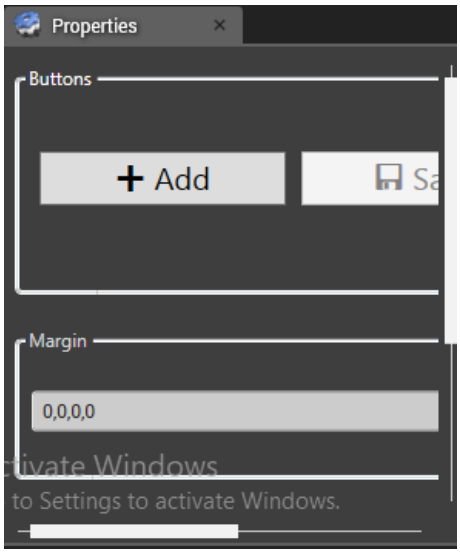
Where possible, default values are placed into edit fields. At any time, with the cursor placed over a blank portion of the command panel, the user may right-click to select Reset Data which will clear all fields and replace default values.

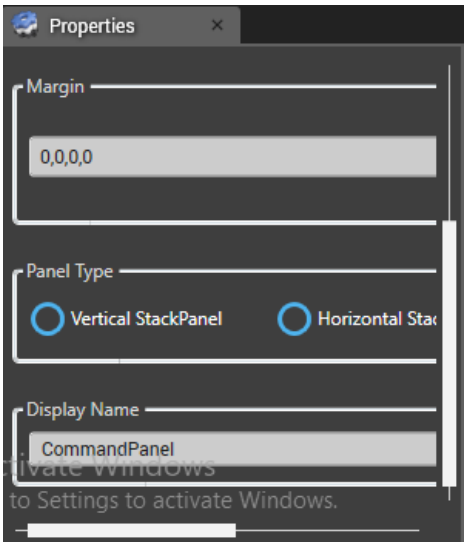
Case 1:-Default setup

1. Default Node Style



(I) Default Property window





3. Preview Window

2. View on HOST

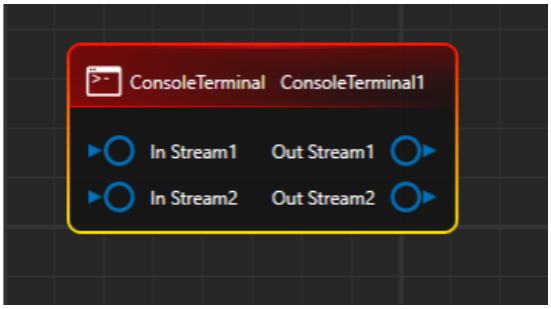
Case 2:-Command Panel working process:

Console Terminal

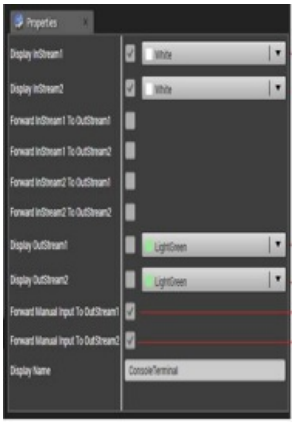
A console is a physical terminal that is the primary terminal that is directly connected to a machine. The console is recognized by the operating system as a (kernel-implemented) terminal. A shell is a primary interface that users see when they log in, and its primary function is to launch other programs.

Case 1:-Default setup

1. Default Node Style

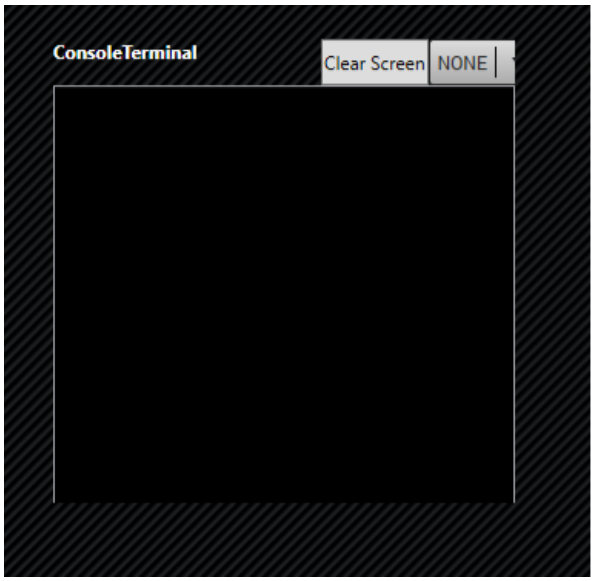


2. Default Property window



3. Preview Window

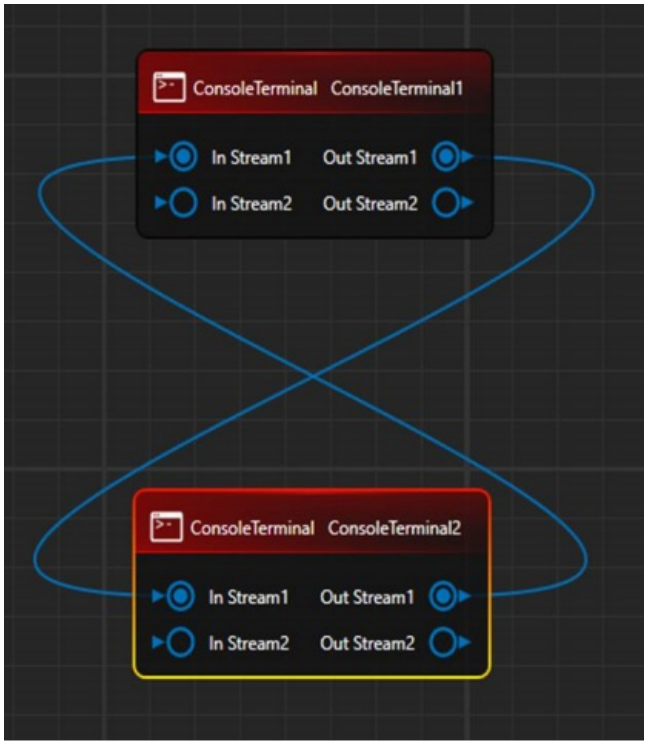
(D) Default view in HOST



Case 2:-Console Terminal working process

1. It will work when its input and out ports are connected with another console terminal input output ports.

Ex-Default setup



2. View in HOST

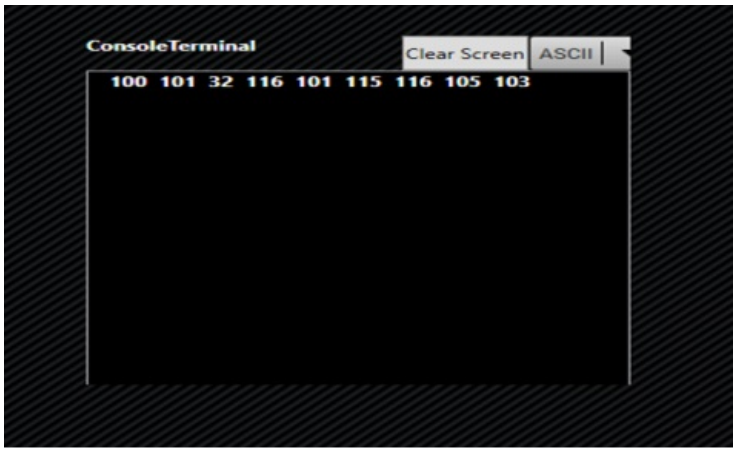
As according to the above connection if something is written in "Consoleterminal_01", it can be seen on "ConsoleTerminal_02" or Vice-Versa.

Feature to see values in different format

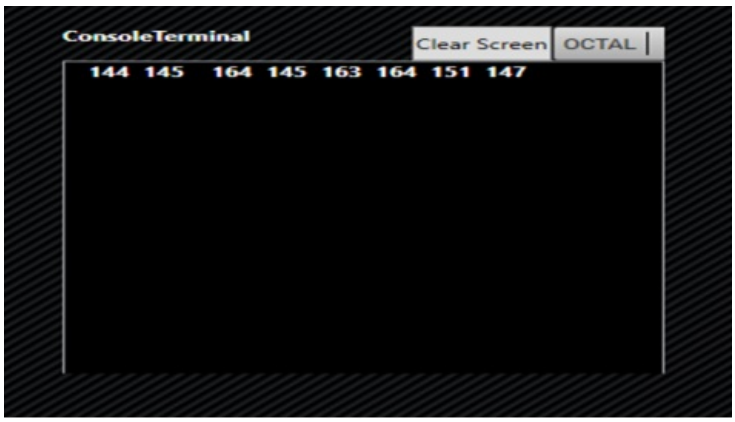
Default View

1. In HEX

2. In ASCII



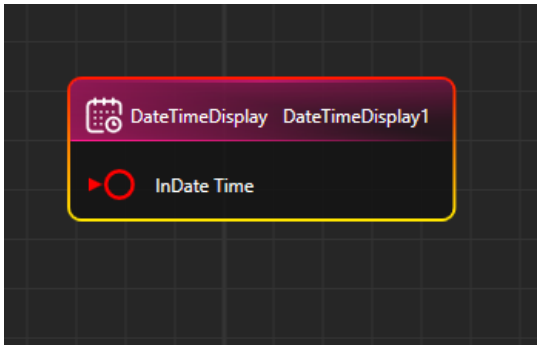
(C) In OCTAL



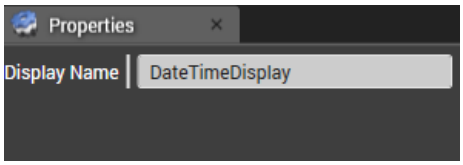
Date Time Display

ISO 8601 describes an internationally accepted way to represent dates and times using numbers. But if you wish to display local time, then you can add a timezone offset for UTC to the value in the formats **+hh:mm** or -hh:mm as needed. The dates appear as, **mm/dd/yyyy in the U.S.** and as, dd/mm/yyyy outside the U.S. where mm is the month, dd is the day, and yyyy is the year. The time is displayed as, hh:mm:ss AM/PM, where hh is the hour, mm is minutes, and ss is seconds.

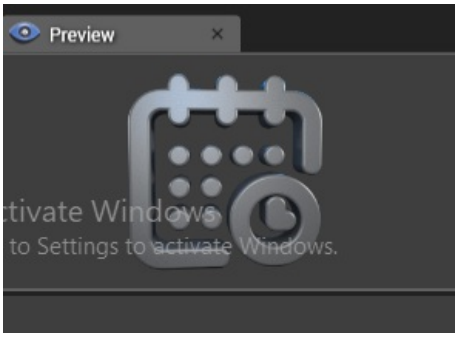
1. Default Node Style



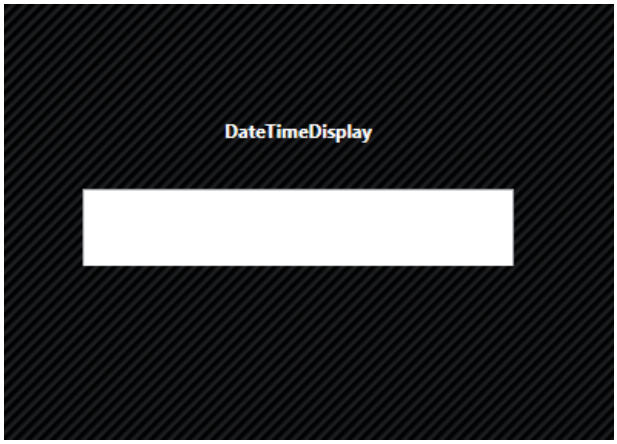
2. Default property window



(C) Default Preview Window



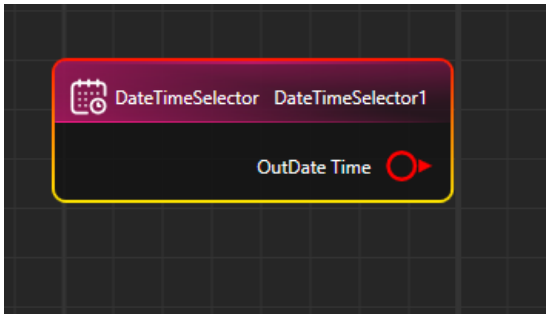
(D) Default View in HOST



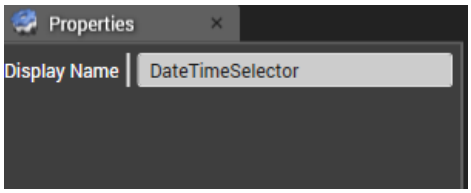
Date Time Selector

A date picker, popup calendar, date and time picker, or time picker is a graphical user interface widget which allows the user to select a date from a calendar and/or time from a time range. Validation of dates by restricting date ranges.

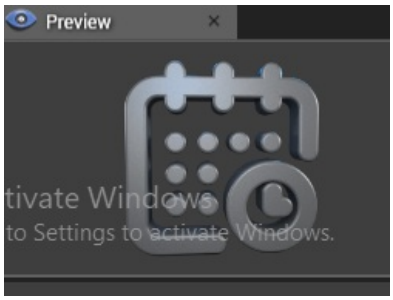
1. Default Node Style



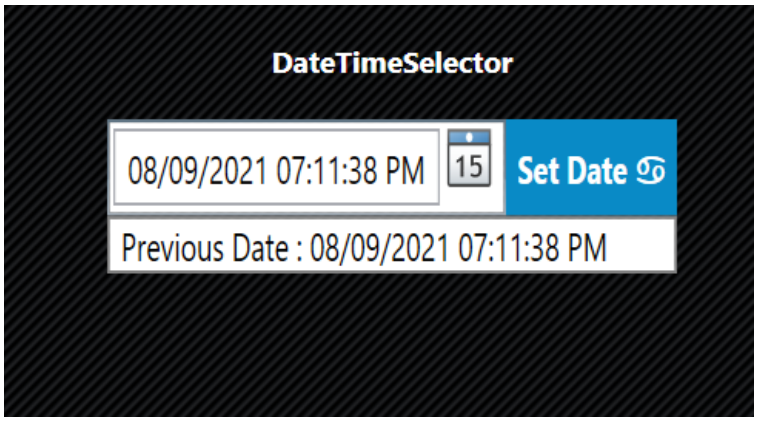
2. Default property window



3. Default Preview Window



4. Default View in HOST

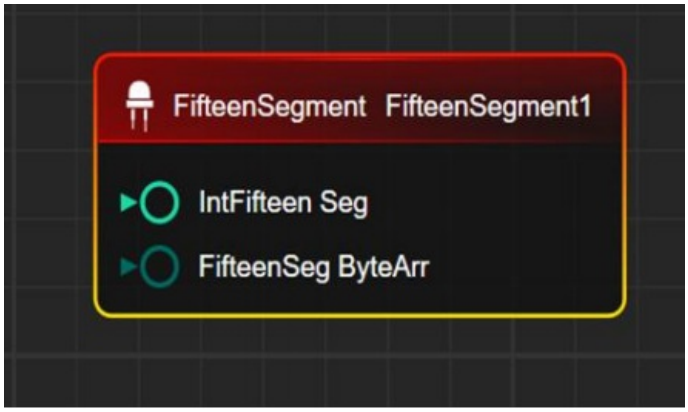


Fifteen Segment

The Fifteen Segment Display is a drag-and-drop virtualization for physical fifteen segment displays. The Fifteen Segment Display can be added to a host to display the standard fifteen segment LED alphanumeric character.

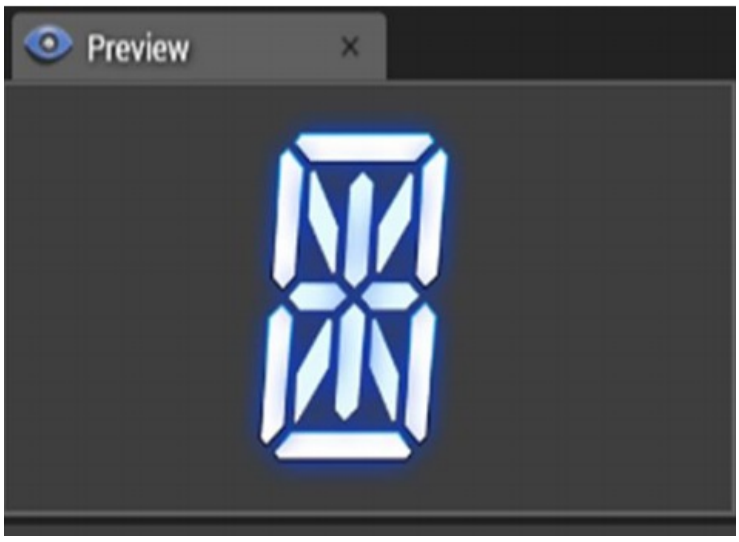
Case 1:-"when Display Input Config" is "ASCII from DisplayByte"

1. Default Node Style

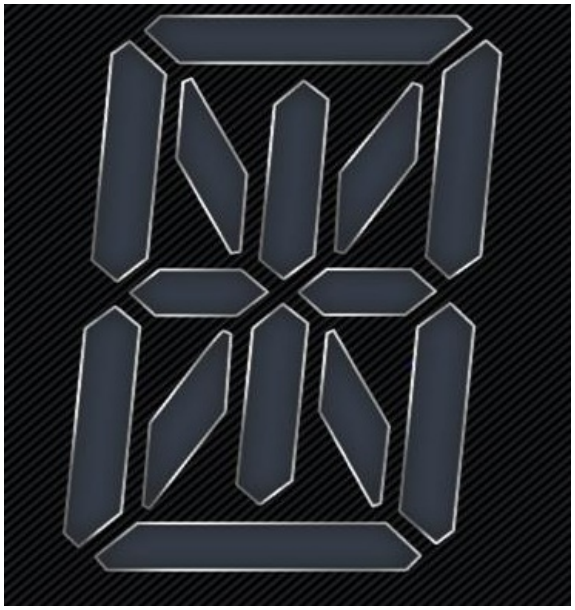


2. Default property window

3. Default Preview Window

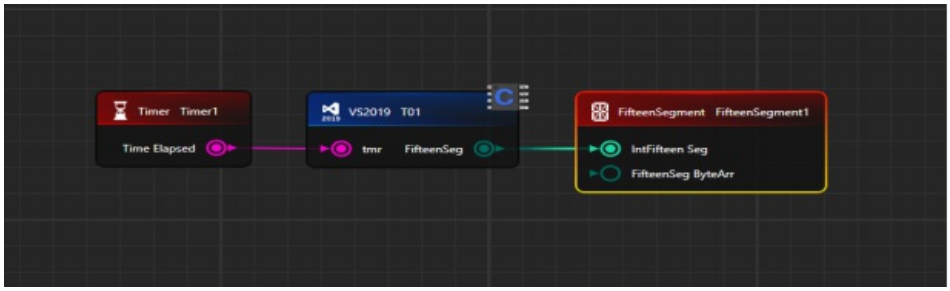


4. Default View in HOST

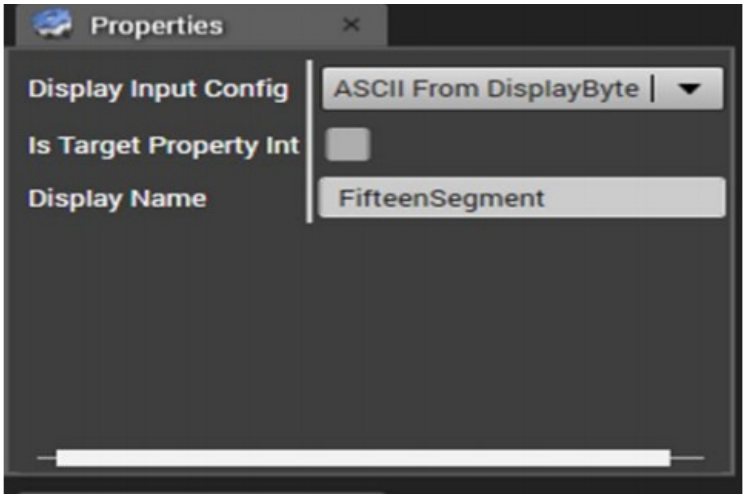


Case 2:-When “Is Target Property Int” is not selected in property window, then sending value should be in Byte format.

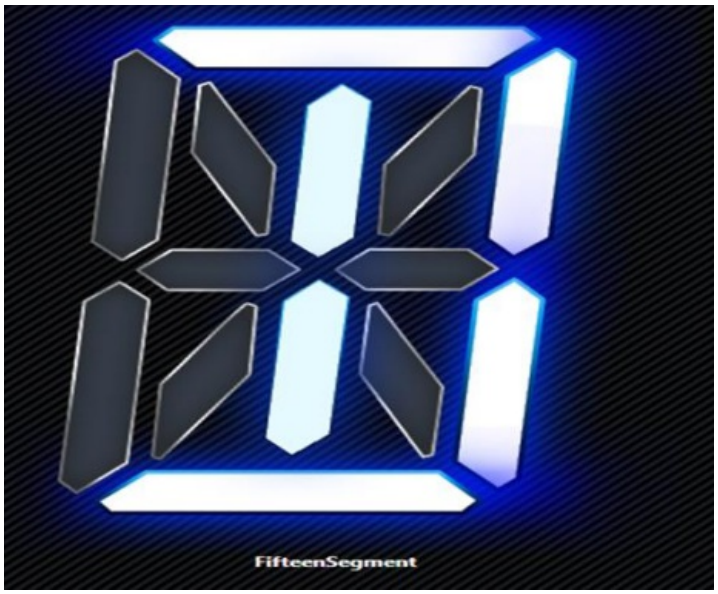
1. Node Style



2. Property Window



3. View in HOST

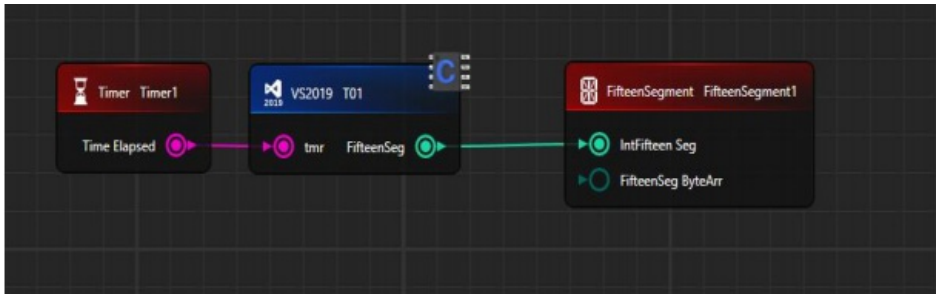


EX:-It will be defined in TMB

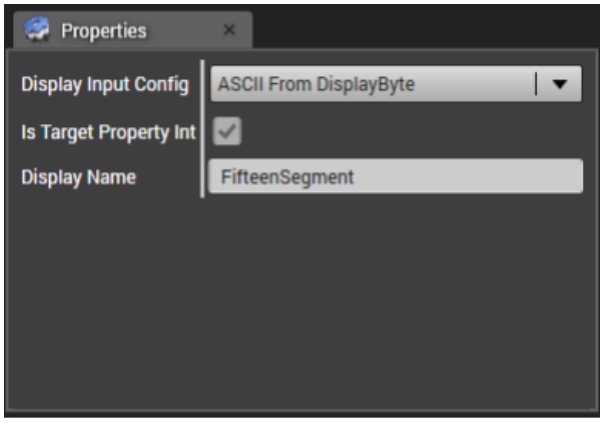
```
unsigned char FifteenSeg = 48;
void tmr()
{
if (FifteenSeg >= 90)
{
FifteenSeg = 48;
}
FifteenSeg++;
}
void main()
{
InitializeVirtuoso(HOST_NAME); //This must be the first function called for
Virtuoso.
//User code must start from here....
//tmr();
while (1)
{
// The call to sleep for 10ms is optional and only needed for computers
// with low hardware configuration. Comment this out if it is not needed.
VirtuosoSleep(10);
}
}
```

Case 3:-When “Is Target Property Int” is selected in property window, then sending value should be Integer

1. Node Style



2. Property window



3. View In HOST

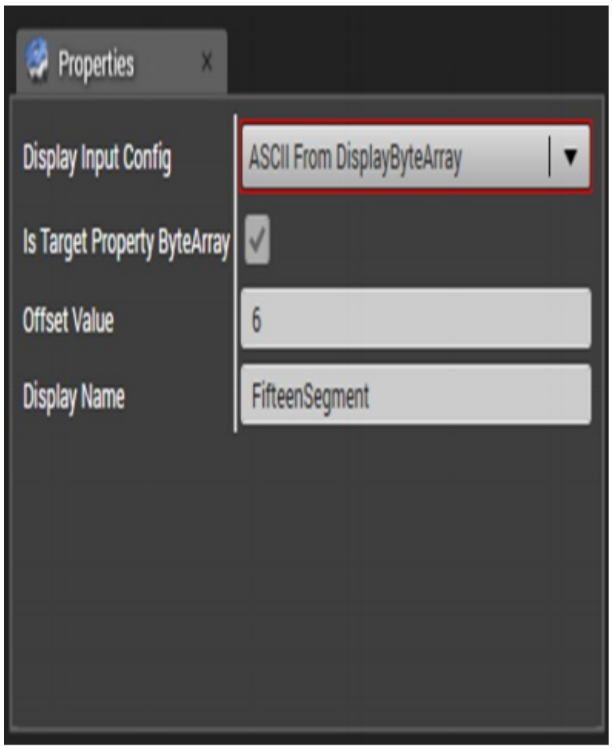
Ex-: It will be defined in TMB

```
unsigned char FifteenSeg = 48;
void tmr()
{
if (FifteenSeg >= 90)
{
FifteenSeg = 48;
}
FifteenSeg++;
}
void main()
{
InitializeVirtuoso(HOST_NAME); //This must be the first function called for Virtuoso.

//User code must start from here....
//tmr();
while (1)
{
// The call to sleep for 10ms is optional and only needed for computers
// with low hardware configuration. Comment this out if it is not needed.
VirtuosoSleep(10);
}
}
```

Case 4:-“when Display Input Config” is “ASCII from DisplayByteArray”

1. Node Style

2. Property Window



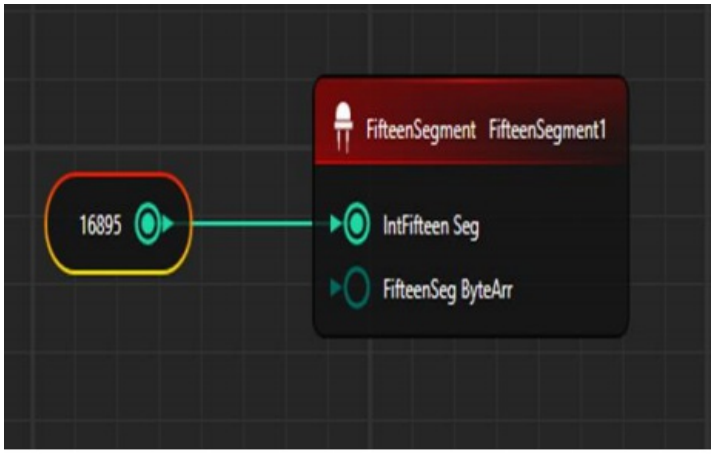
Note:Need to provide array from "TMB"

```
unsigned char FifteenSegArr[] = {
68,69,70,71,72,73,74,75
};
```

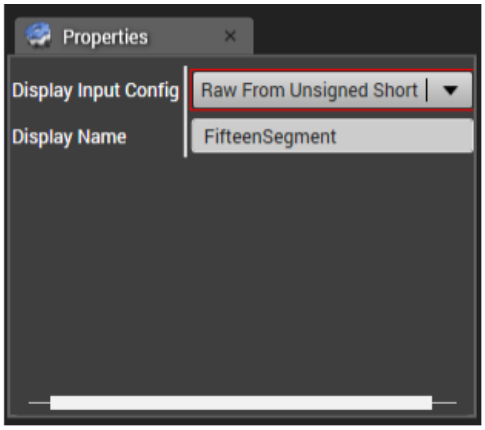
3. View in HOST

Case 5:-"when Display Input Config" is "Raw from UnsignedShort"
Value In binary: 100 0001 1111 1111
Value in DEC for binary value in "USHORT": 16,895

1. Node Style



2. Property Window



3. View in HOST

Knob Control

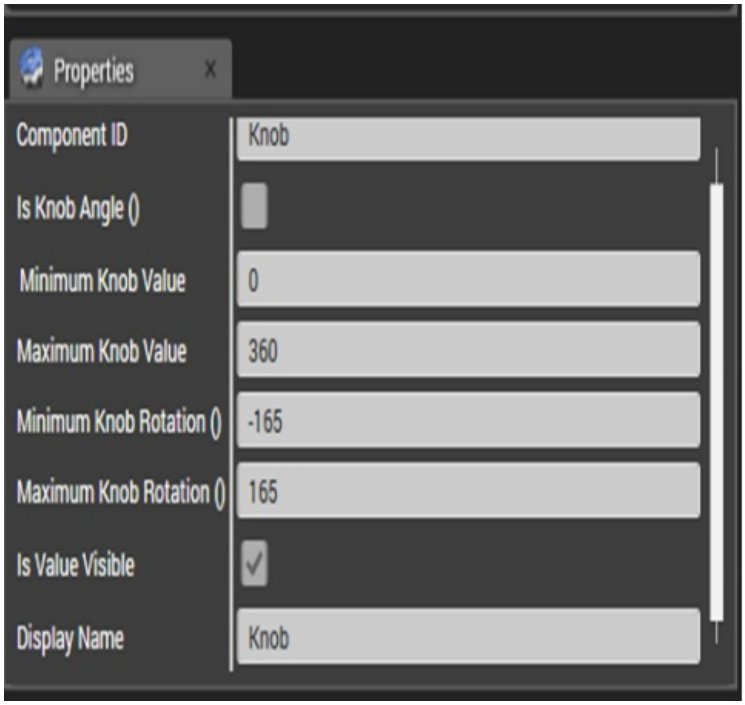
A control knob is a rotary control used to provide input to a device when grasped by an operator and turned, so that the degree of rotation corresponds to the desired input. Such knobs are one of the most common components in control systems and are found on all sorts of devices. Such knobs vary greatly in form, but as a rule they are

expected to be grasped by the fingertips. By convention a clockwise rotation ordinarily produces an "increased" input, whatever that is understood to be. Knobs may turn continuously or may have detents to produce discrete selections; they commonly have a scale with a pointer to aid achievement of the desired setting, though it is common for the gradations in the scale to have no concrete meaning. There is frequently a fixed "off" position at the origin of movement in which the knob actuates a switch shutting down whatever behavior is controlled, rather than having a separate on/off switch.

Case 1:Default Setup

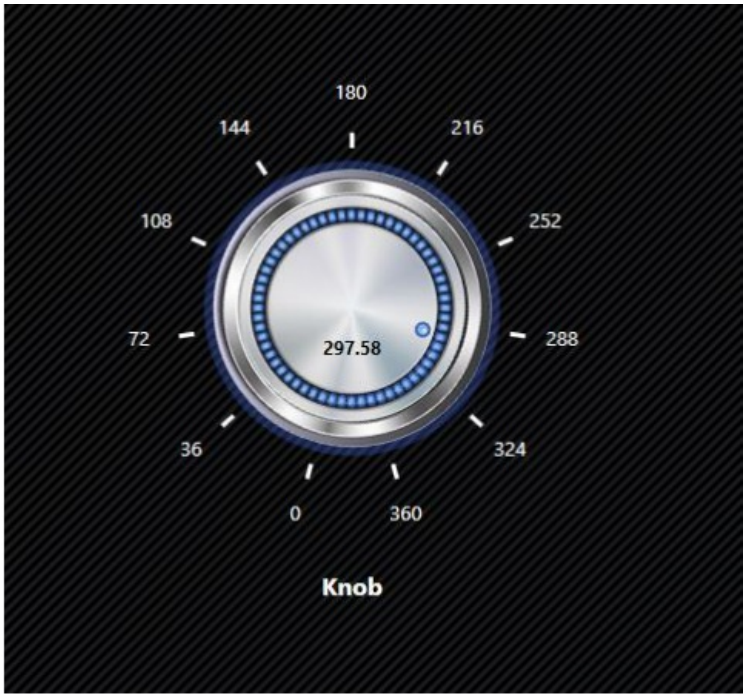
1. Default NodeStyle

2. Default Property window



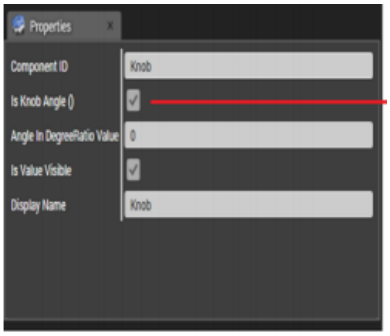
(3) Default Preview Window

(4) Default View in HOST

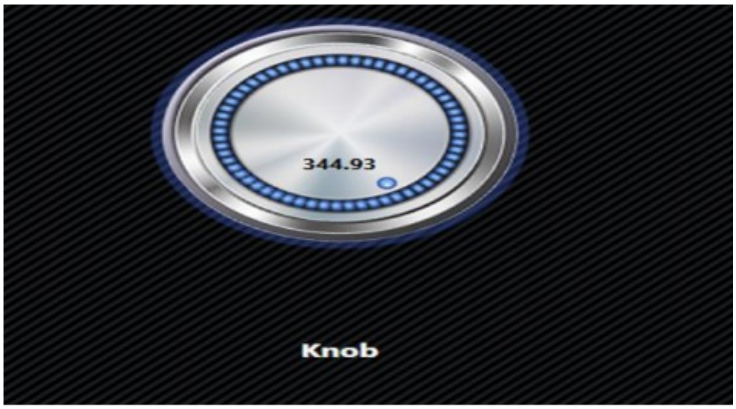


Case 2:-When “Is Knob Angle()” is checked in property window

1. Property window



2. View in HOST



Case 3: when “Is Value Visible” is unchecked in property window

1. Property Window

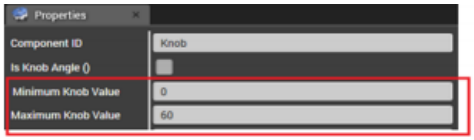
2. View in HOST

when "Is Value Visible" CheckBox is True

when "Is Value Visible" CheckBox is False

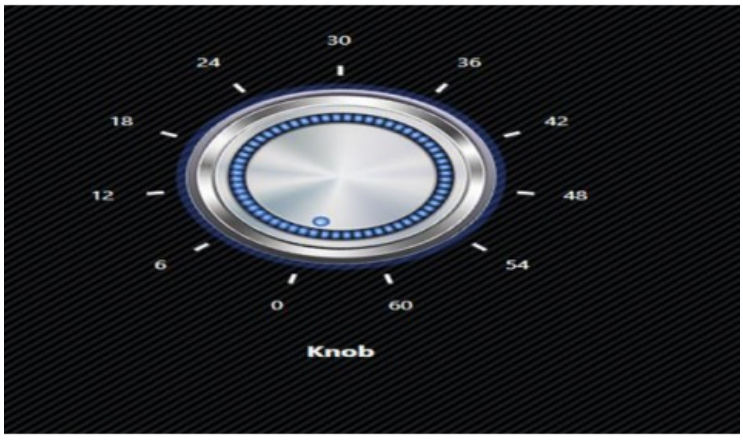
Case 4:-Changing values in property window for "Max Knob Value" and "Min Knob Value"

1. Property Window



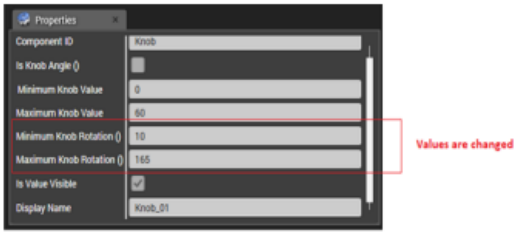
after making change in Knob values

2. View in Host

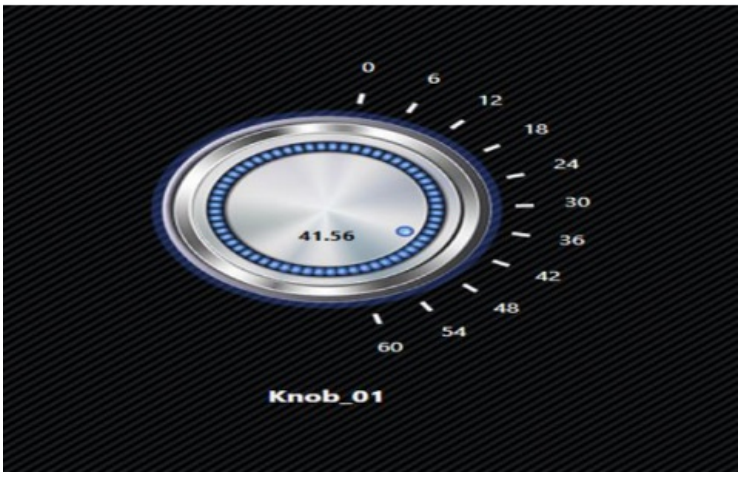


Case 5:-When "Minimum Knob Rotatation" and "Maximum Knob Rotation" is changed

1. Property Window



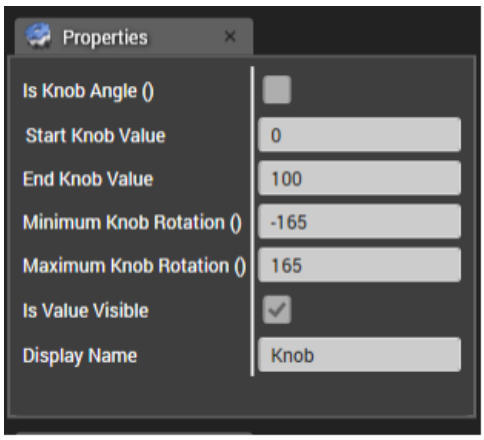
2. View in HOST



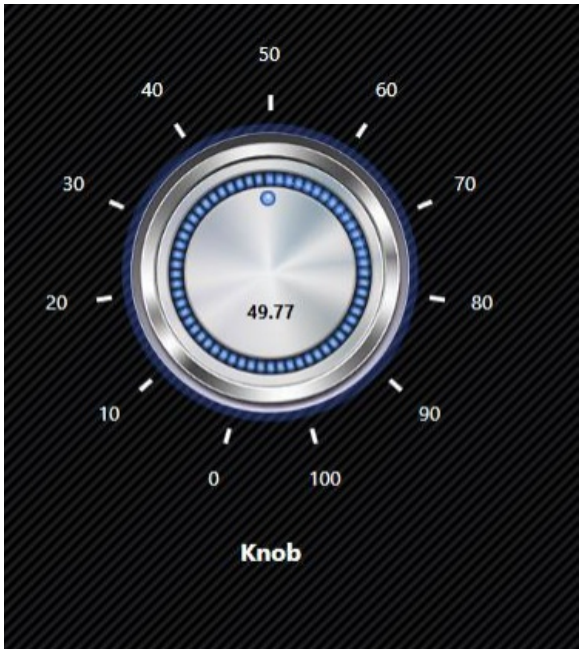
Case 6:-Different Tick values scale

1. When Tick value scale like (0 To 100)

1. Property window

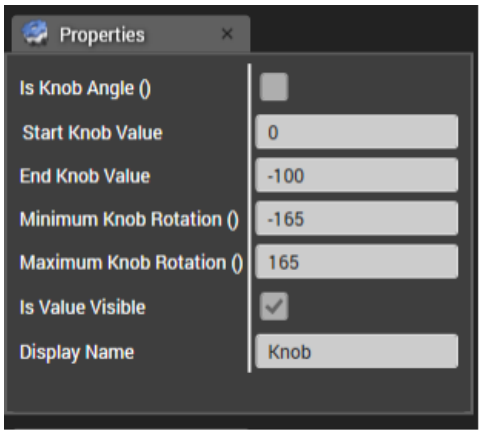


2. View in HOST

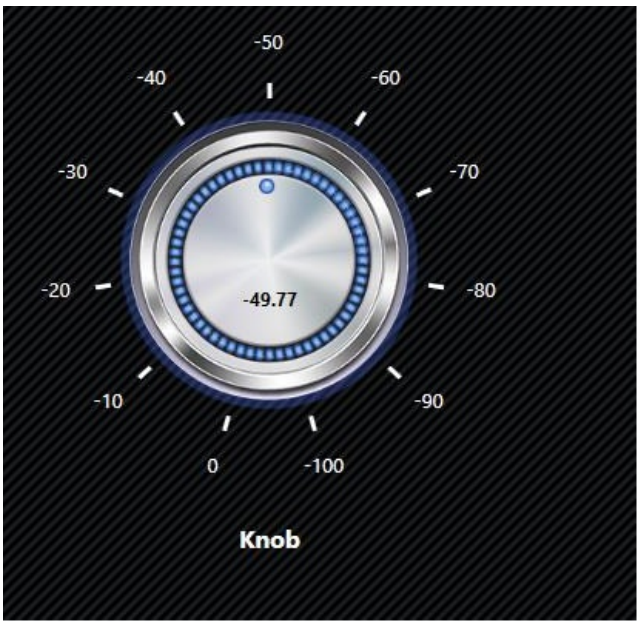


(B)When Tick value scale like(0 To -100)

1. Property window

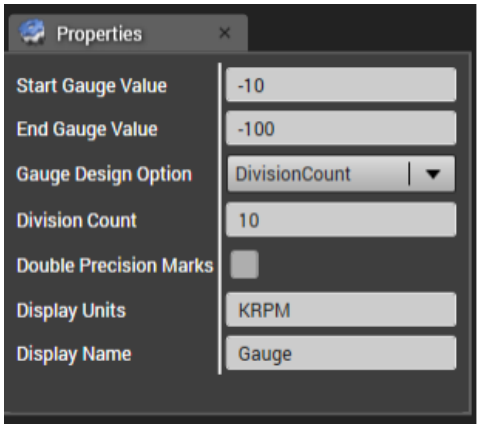


2. View in HOST

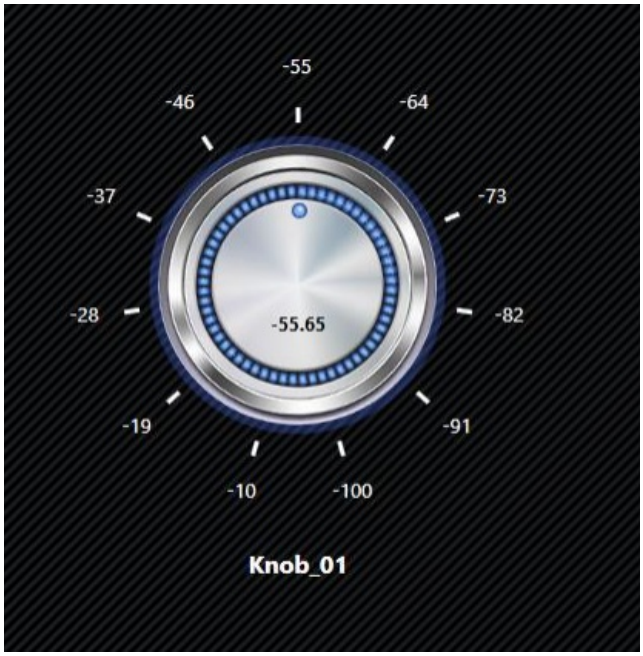


3. When Tick value scale like(-10 To -100)

1. Property window

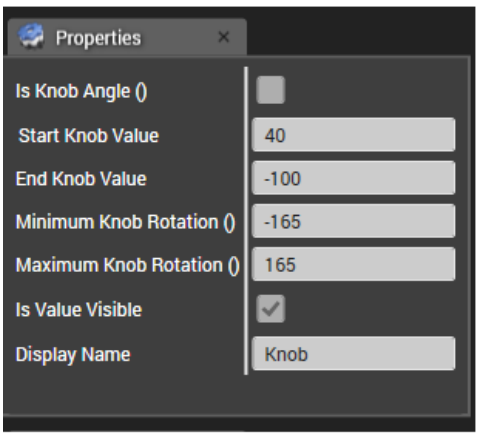


2. View in HOST



4. When Tick value scale like(40 To -100)

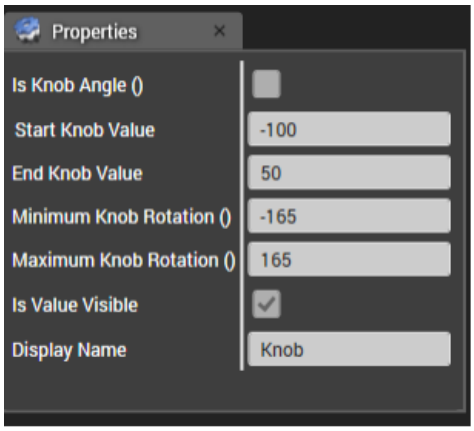
1. Property window



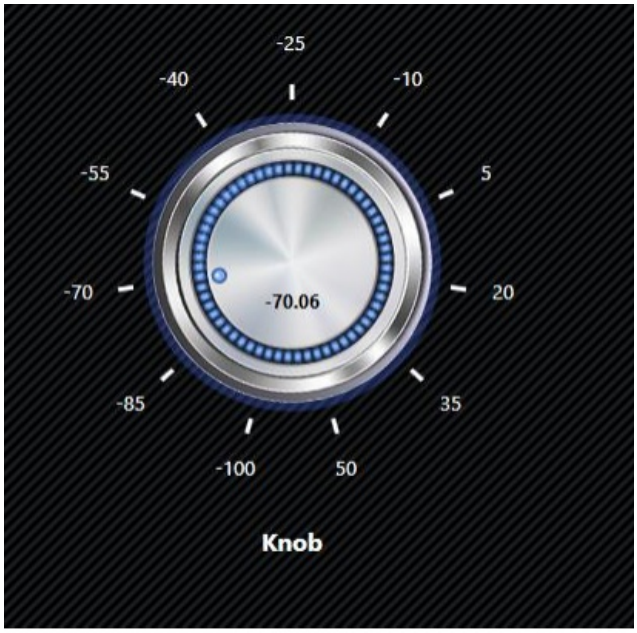
2. View in HOST

5. When Tick value scale like(-100 To 50)

1. Property window

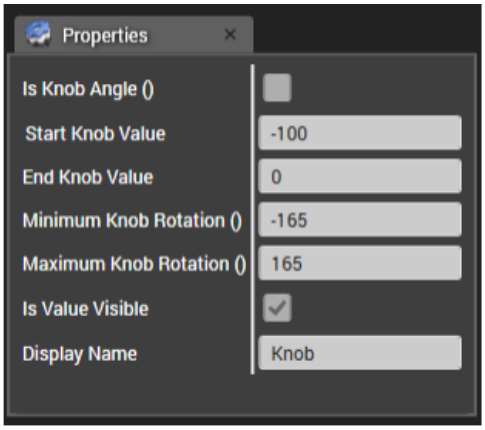


2. View win HOST



6. When Tick value scale like(-100 To 0)

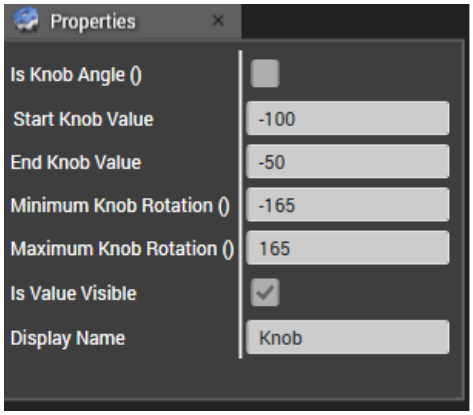
1. Property window



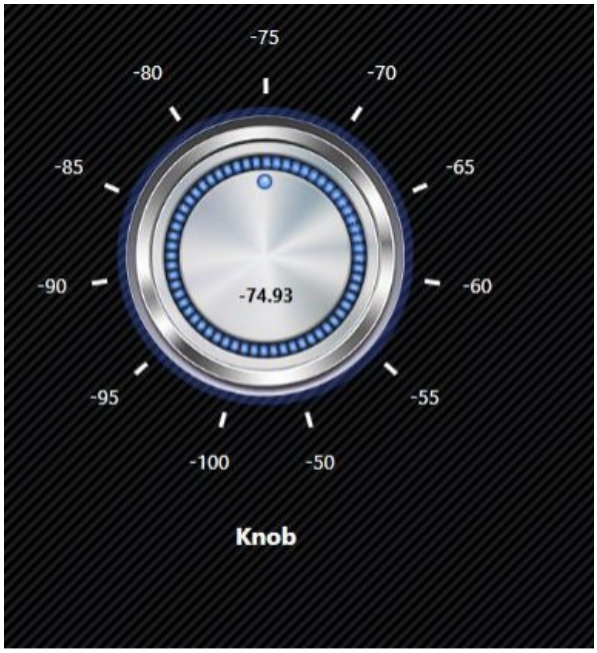
2. View in HOST

7. When Tick value scale like(-100 To -50)

1. Property window



2. View in HOST

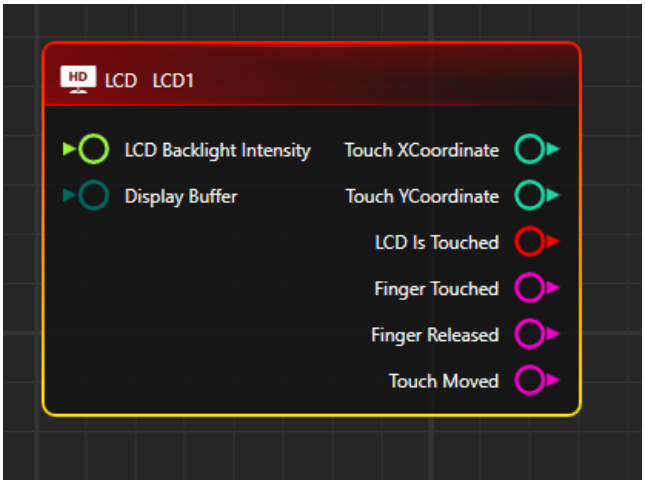


Note: Value of this control is persist. It maintains the last state of the control.

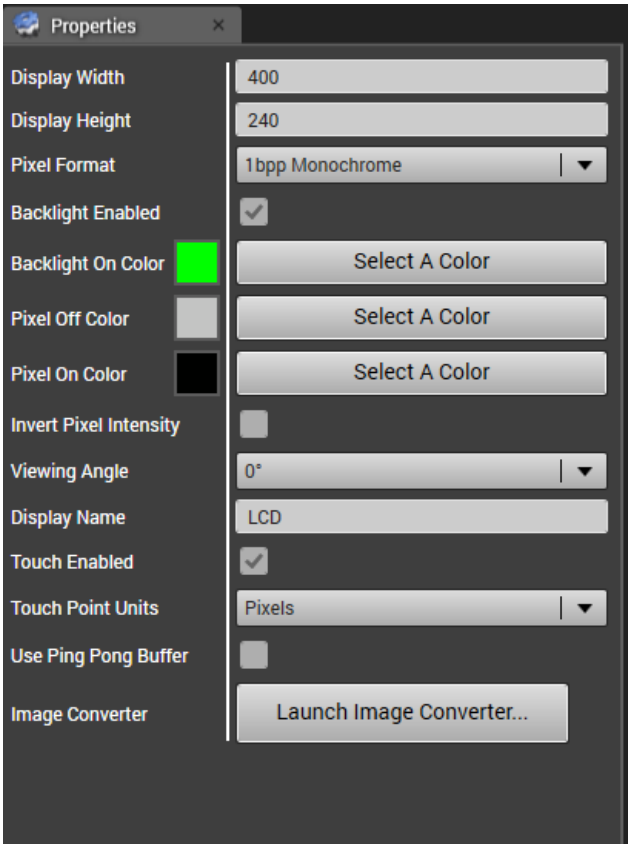
LCD

A liquid crystal display is a flat panel display or other electronically modulated optical device that uses the light modulating properties of liquid crystals combined with polarizers. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome. LCDs are available to display arbitrary images or fixed images with low information content, which can be displayed or hidden. They use the same basic technology, except that arbitrary images are made from a matrix of small pixels while other displays have larger elements. LCDs can either be normally on (positive) or off (negative), depending on the polarizer arrangement. For example, a character positive LCD with a backlight will have black lettering on a background that is the color of the backlight, and a character negative LCD will have a black background with the letters being of the same color as the backlight. Optical filters are added to white on blue LCDs to give them their characteristic appearance.

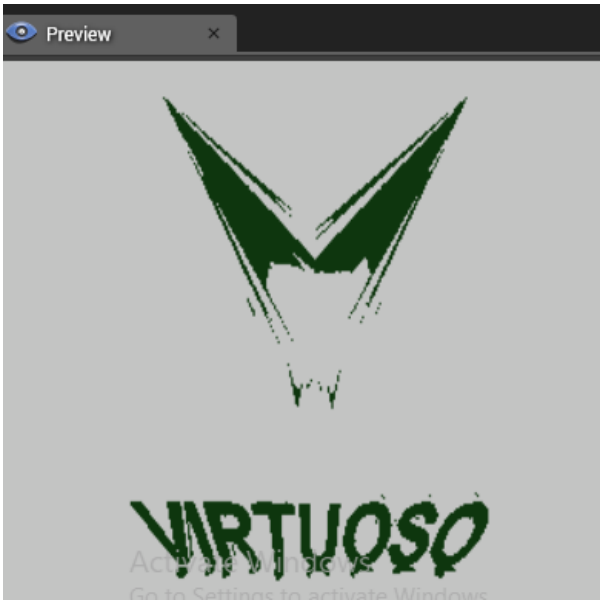
(1)Default Node Style



(B) Default Property window



(C) Preview Window



(D) Default View on HOST

LED Control

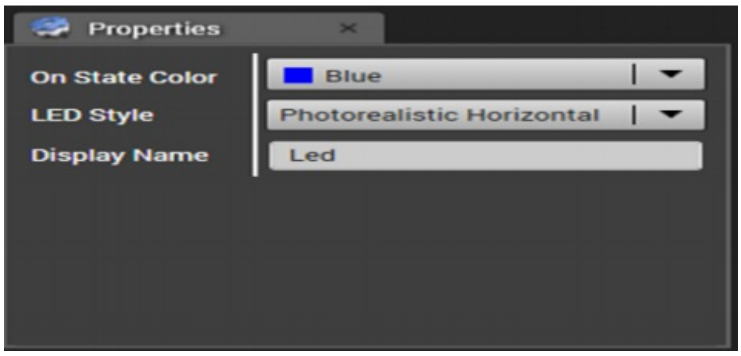
A light emitting diode is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons.

1. View in HOST will be as according to the Led Style

Case 1:-Default Setup

1. Default Node Style

2. Default Property Window

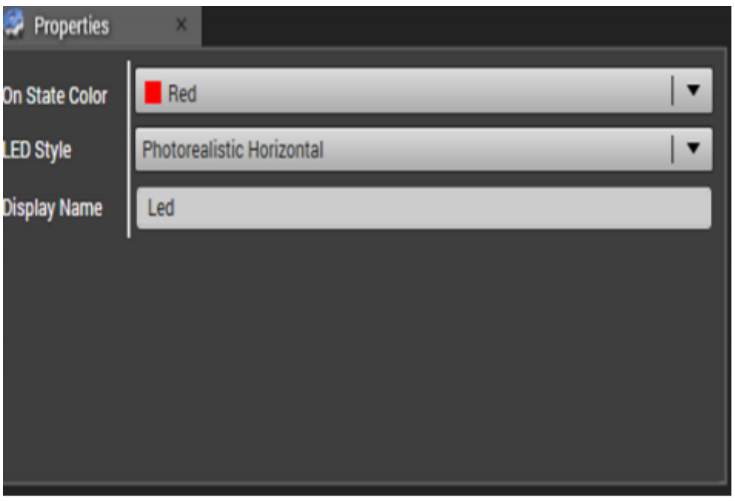


3. Default Preview Window

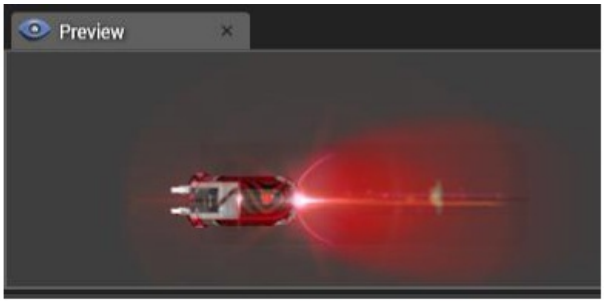
4. Default View in HOST

Case 2:-On changing “On State Color”

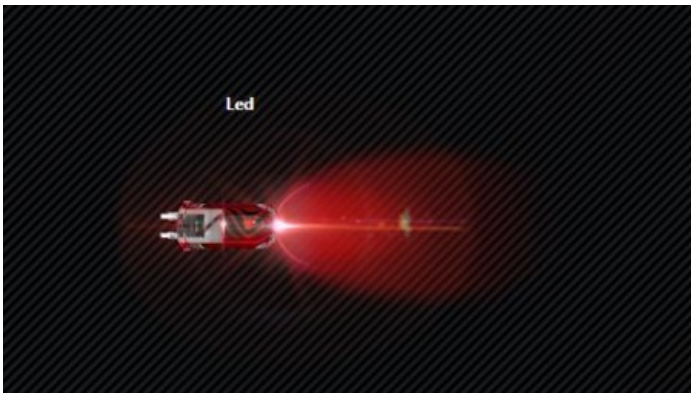
1. Property window



2. Preview Window

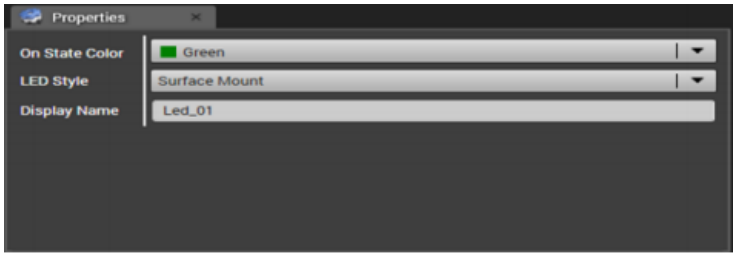


3. View In HOST

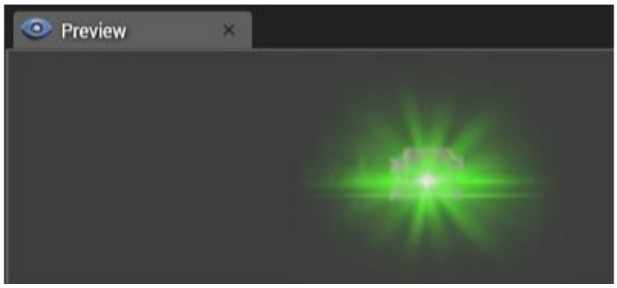


Case 3:-On changing “LED Style”

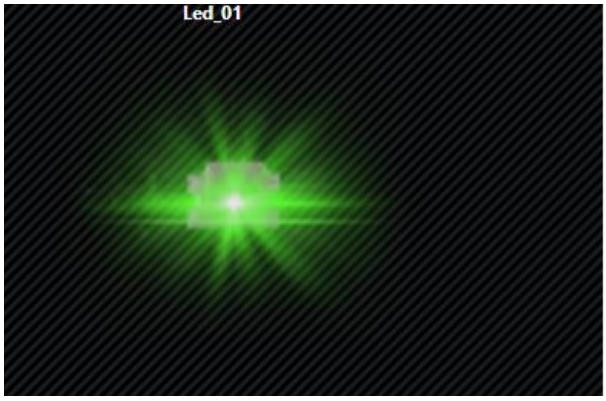
1. Property window



2. Preview Window

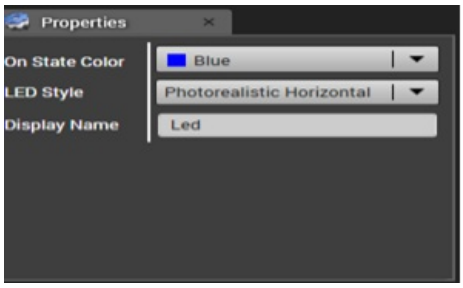


3. View in HOST

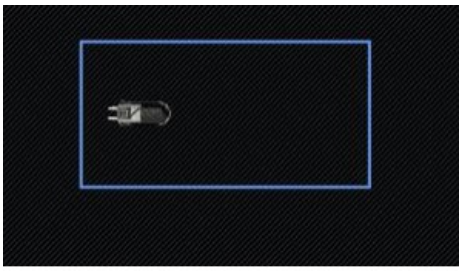


Case 4:-On changing “LED Style” designer view in HOST

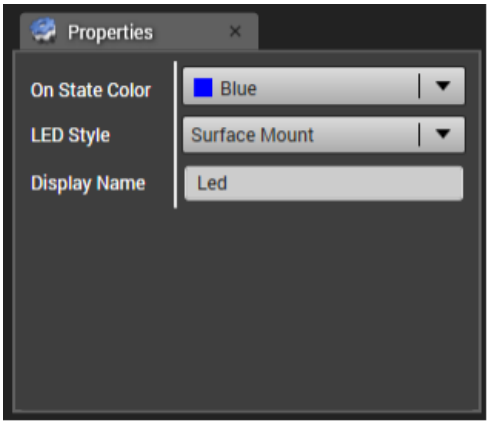
1. Property window



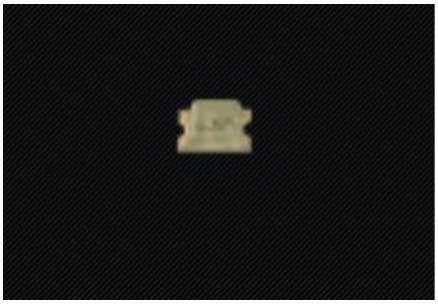
2. View in HOST at Design time



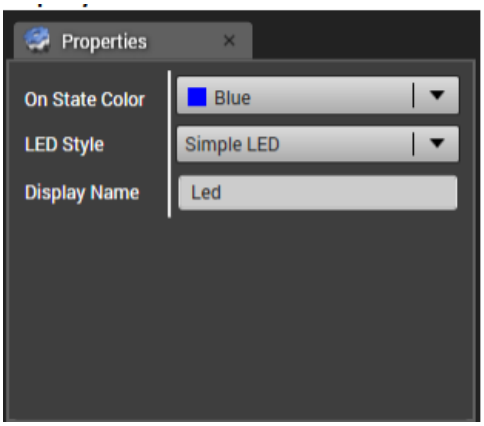
3. Property window



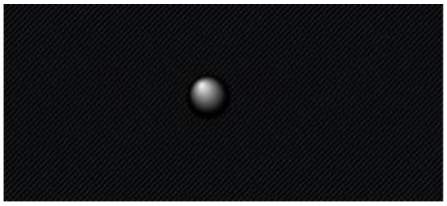
4. View in HOST at design time



5. Property window



6. View in HOST at design time

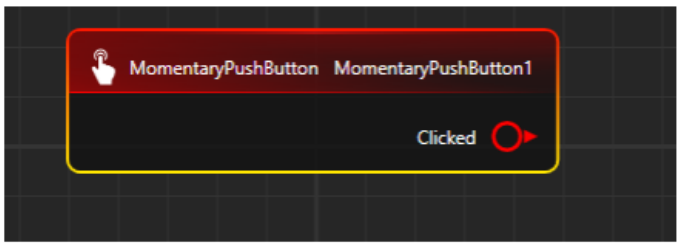


Momentary Pushbutton Control

A type of switch usually in the form of a push button that is only engaged while it is being depressed, as opposed to a typical “on/off” switch, which latches in its set position. Momentary switches may be normally open or normally closed. A momentary switch requires continuous compression to keep contact within the circuit and keep the device “on”. Momentary push button switches can be either “push to make” which switches the device on, or “push to break” which switches the device off.

Case 1:-Default Setup

1. Default Node Style



2. Default Property Window

3. Default Preview Window

4. Default View In HOST

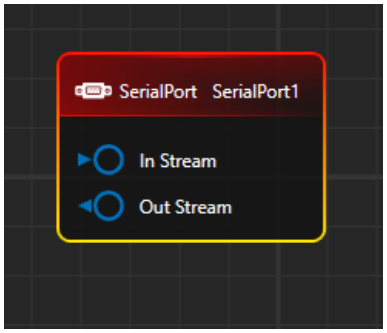
Note: It will either provide “True” or “False” value

Serial Port Control

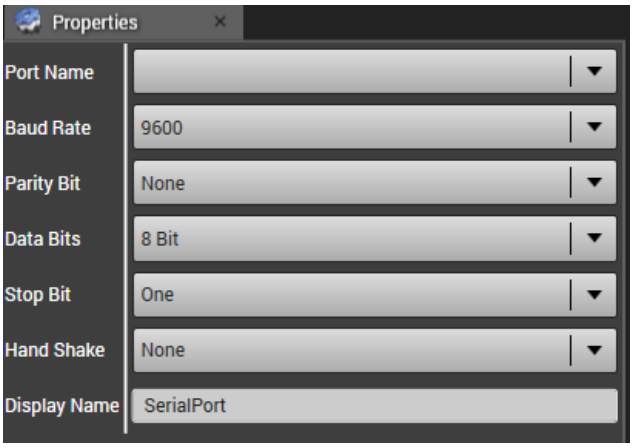
A serial port is a serial communication interface through which information transfers in or out sequentially one bit at a time. This is in contrast to a parallel port, which communicates multiple bits simultaneously in parallel. Serial ports are widely used by sensors for data acquisition, and they were standard on early computers for connecting a modem, mouse and other peripherals.

Case 1:-Default Setup

1. Default Node Style



2. Default Property Window



3. Default Preview Window

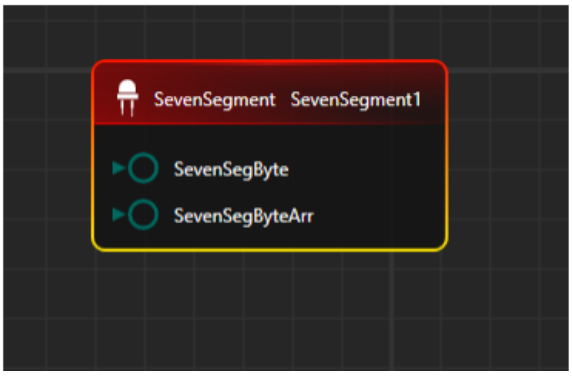
4. Default view in HOST

Seven Segment Control

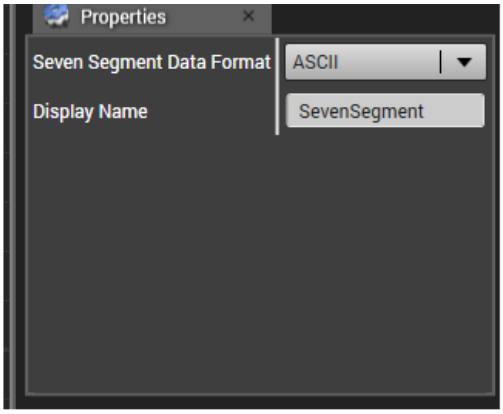
A seven segment display is a form of electronic display device for displaying decimal numerals that is an alternative to the more complex dot matrix displays. Seven segment displays are widely used in digital clocks, electronic meters, basic calculators, and other electronic devices that display numerical information.

Case 1:-Default Setup

1. Default Node Style

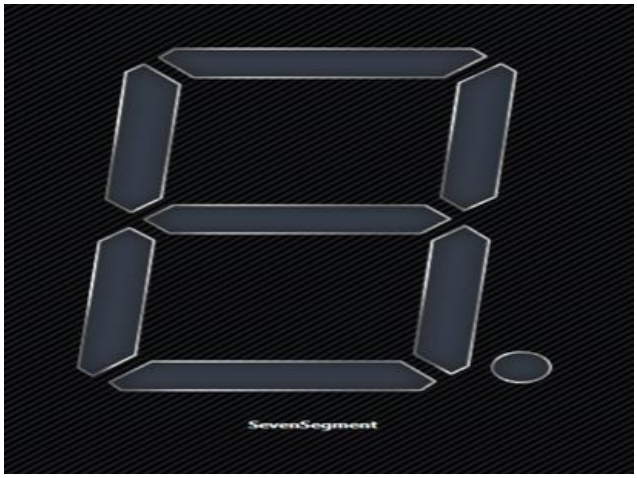


2. Default Property Window



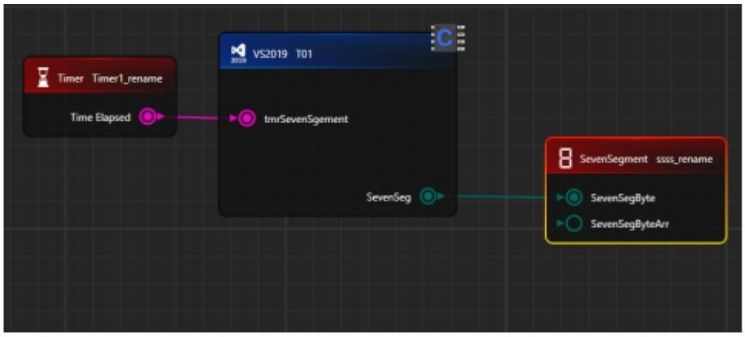
3. Default Preview Window

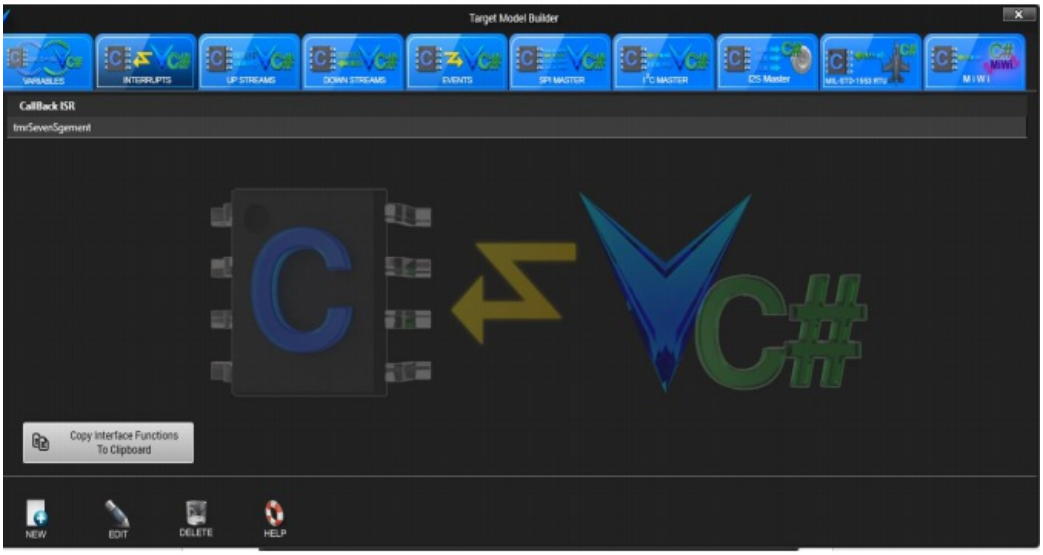
4. Default view in HOST



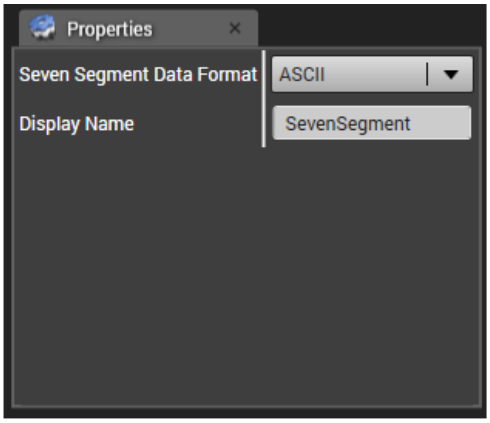
Case 2:- Result in Default Settings

1. Node Style





2. Property Window



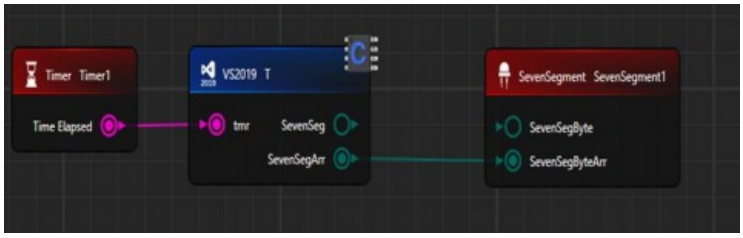
3. View in HOST

Ex:-It will be defined in TMB

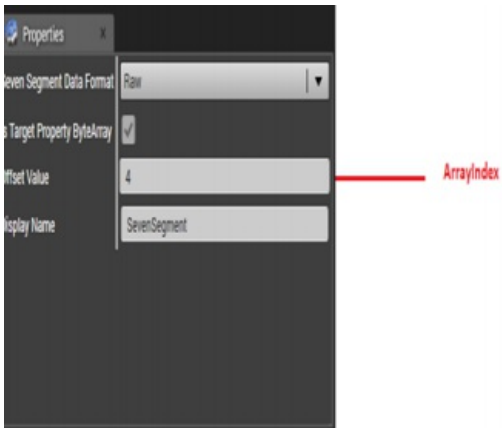
```
unsigned char SevenSeg = 48;

void tmrSevenSgement()

{

if (SevenSeg >= 58)

{

SevenSeg = 48;

}

SevenSeg++;

}
```

Case 3:-when raw data is supplied in the form of “Array”

1. Default Setting of Node



2. Default Setting for Property Window



3. View in HOST

Implemented Example:-It is implemented in TMB

unsigned char SevenSegArr[] = {

250,200,215,210,255

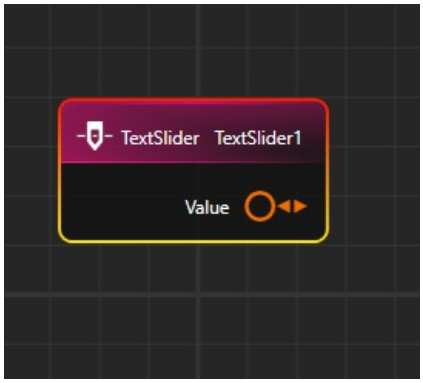
};

Text Slider Control

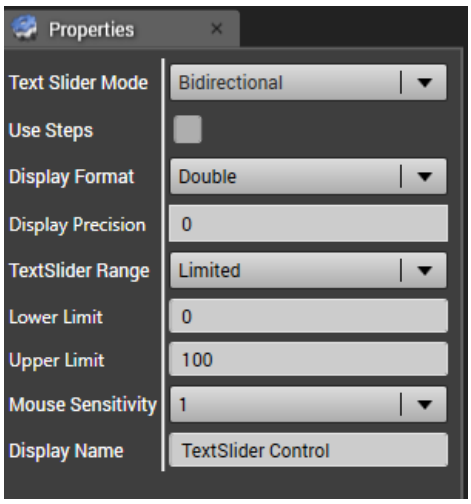
Text Sliders is a simple solution to create pretty text only sliders quickly and friendly. You can use it to display quotes, client's testimonials, reviews, or show your post content in a text slider.

Case 1:-Default Setup

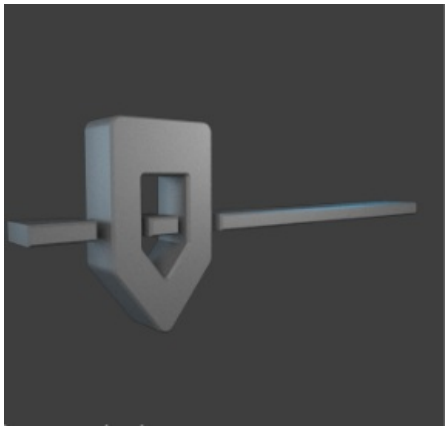
1. Default Node Style



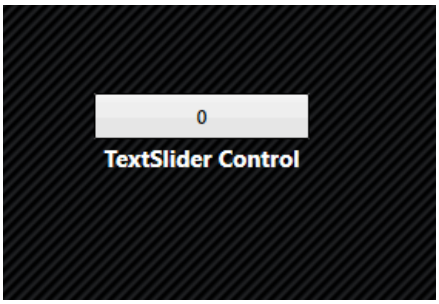
2. Default Property Window



3. Default Preview Window



4. View in HOST

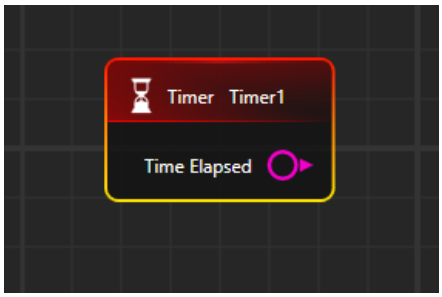


Timer Control

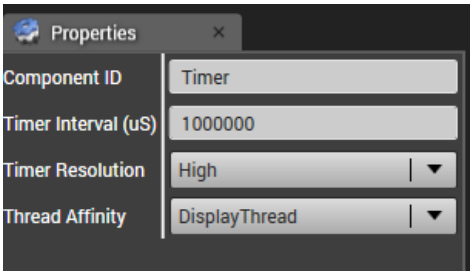
A timer is a specialized type of clock used for measuring specific time intervals. Timers can be categorized into two main types. A timer which counts upwards from zero for measuring elapsed time is often called a stopwatch, while a device which counts down from a specified time interval is more usually called a timer. A simple example of this type is an hourglass. The timer control is a looping control used to repeat any task in a given time interval. It is an important control used in Client-side and Server-side programming, also in Windows Services. Furthermore, if we want to execute an application after a specific amount of time, we can use the Timer Control.

Case 1:-Default Setup

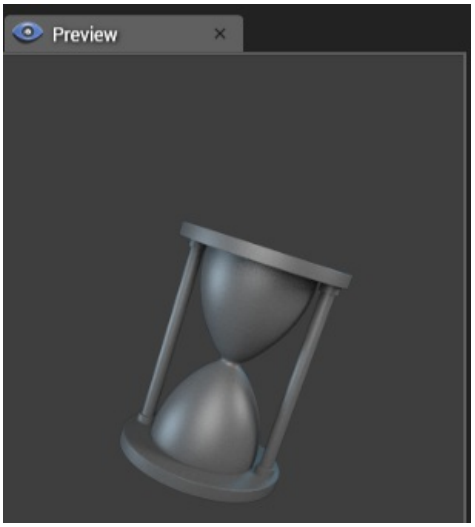
1. Default Node Style



2. Default Property Window



3. Default Preview Window



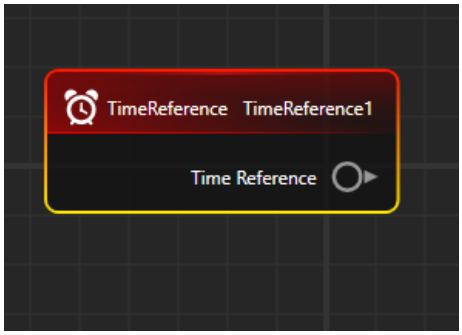
Note: It does not have any view. So it can't be seen in HOST. It is used to generate timer based event in TMB.

Time Reference Control

The time reference for the synchronization of the system can be given by any stable and accurate over time Precise Positioning System, generated by another system. A system that uses coordinates to establish position. coordinate system, frame of reference, reference frame.

Case 1:-Default Setup

1. Default Node Style



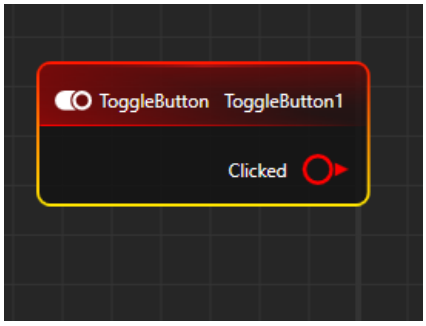
Note: No specific property, preview and host view

Toggle Button Control

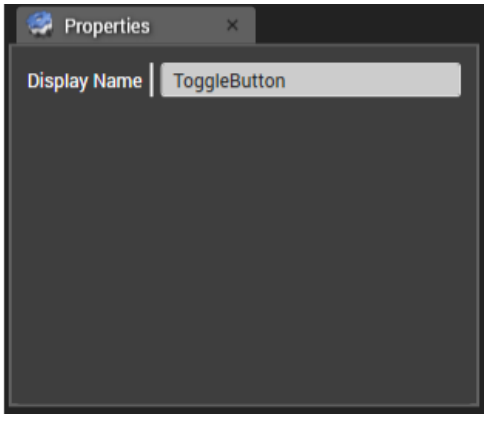
A cycle button or toggle button is a graphical control element that allows the user to choose one from a predefined set of options. It is used as a button, the content of which changes with each click and cycles between two or more values. the currently displayed value is the user's choice. A toggle button allows the user to change a setting between two states.

Case 1:-Default Setup

1. Default Node Style



2. Default Property Window



3. Default Preview Window

4. View in HOST

Note: It will either provide “True” or “False” value. It also persist the last state.