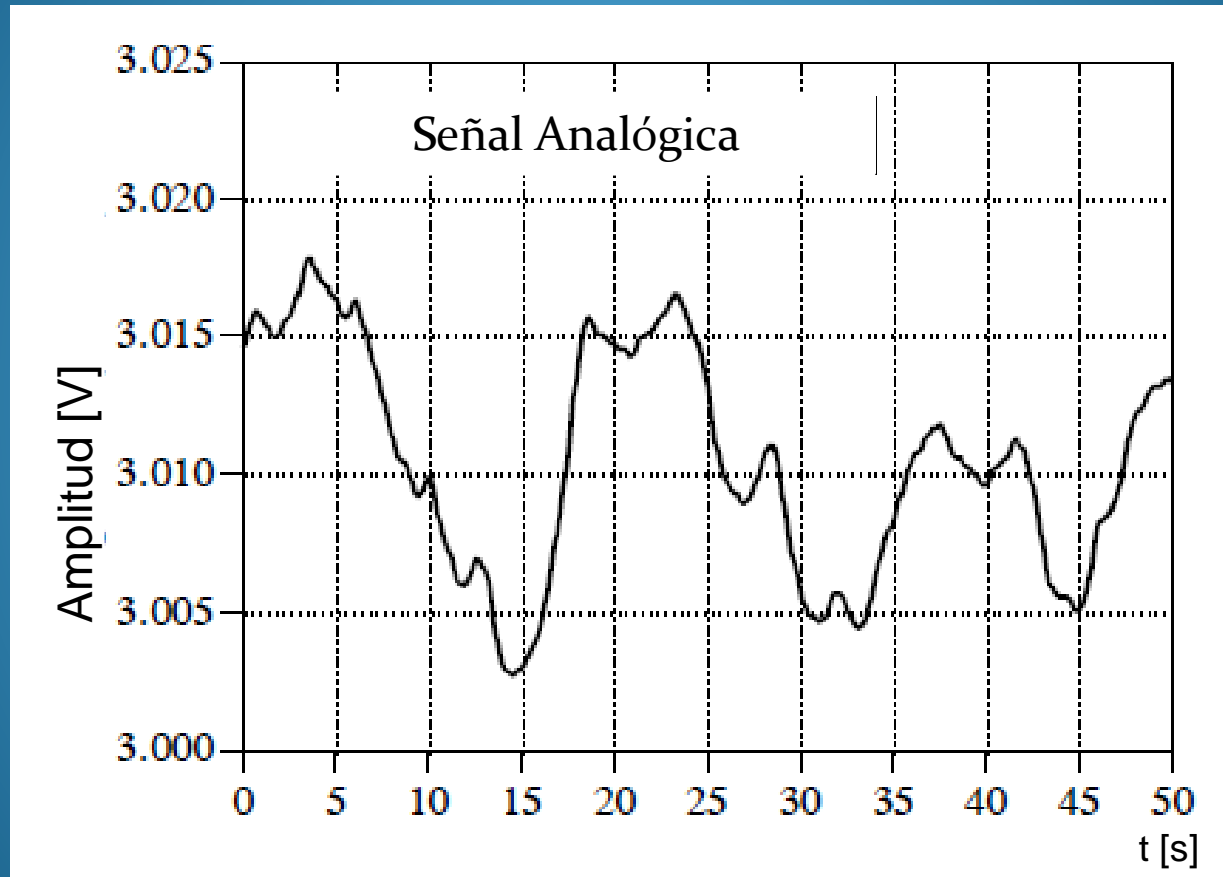


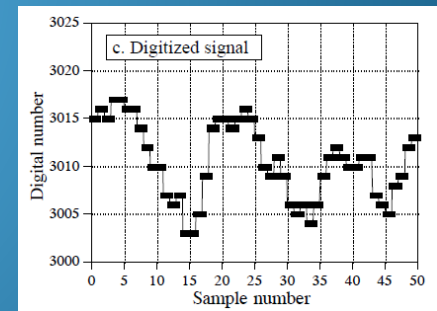
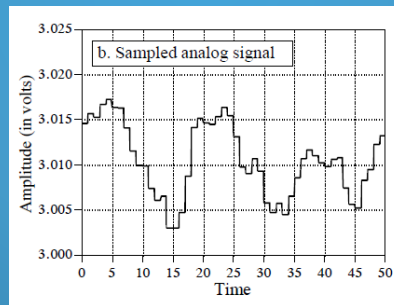
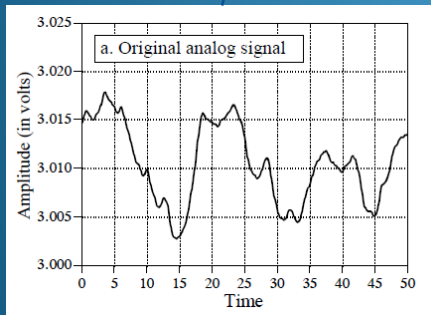
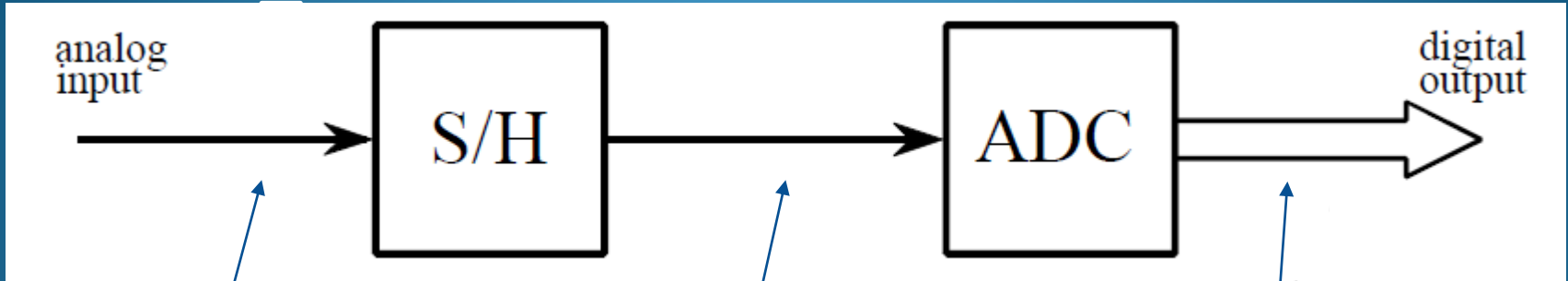


TECNICAS DIGITALES III

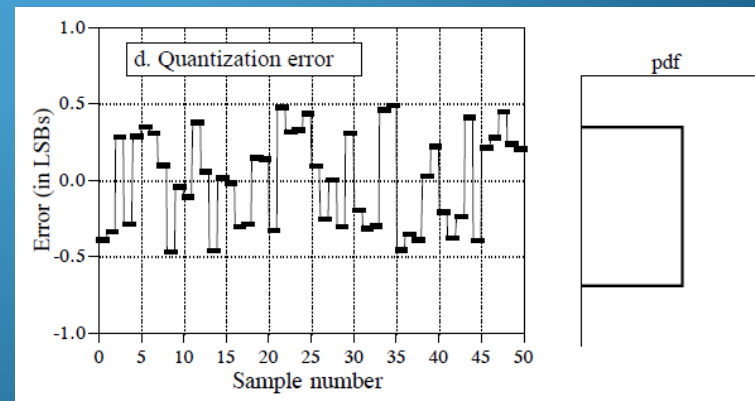
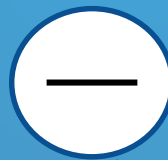
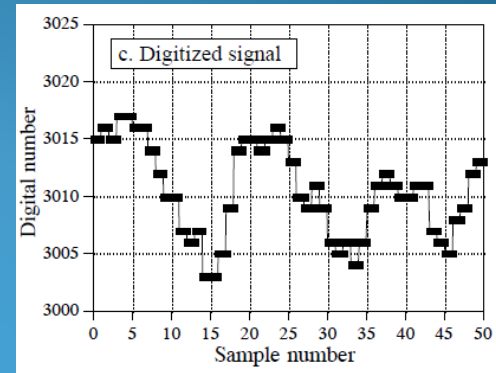
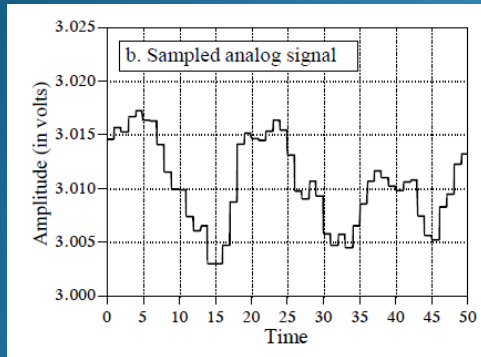
Conversor Analógico Digital



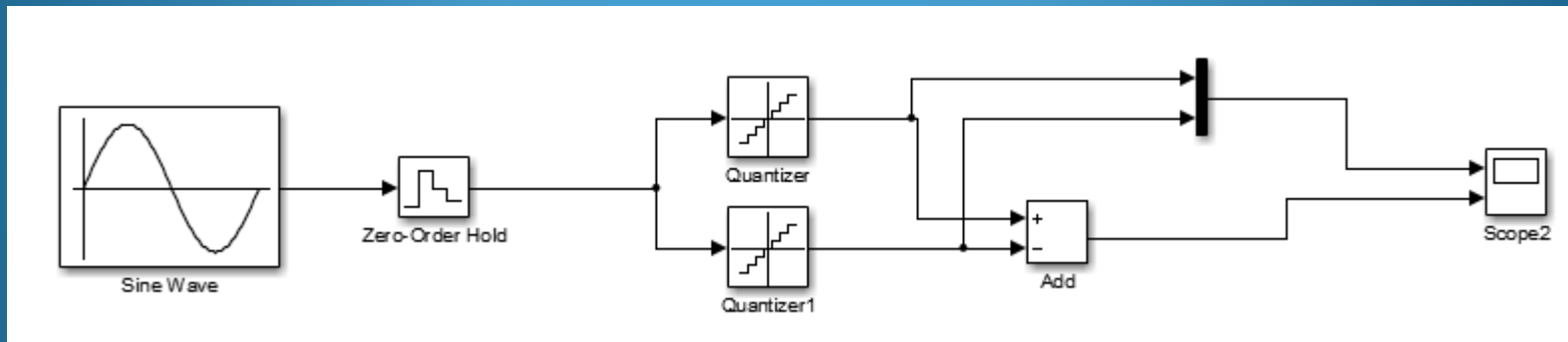
Conversor AD




Conversor Analógico Digital



Conversor AD



 Source Block Parameters: Sine Wave

Sine Wave

Output a sine wave:

$$O(t) = \text{Amp} * \sin(\text{Freq} * t + \text{Phase}) + \text{Bias}$$

Sine type determines the computational technique used. The parameters in the two types are related through:

Samples per period = $2 * \pi / (\text{Frequency} * \text{Sample time})$

Number of offset samples = $\text{Phase} * \text{Samples per period} / (2 * \pi)$

Use the sample-based sine type if numerical problems due to running for large times (e.g. overflow in absolute time) occur.

Parameters

Sine type:

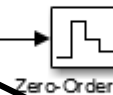
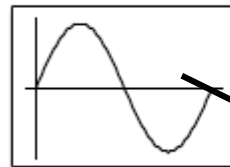
Time (t):

Amplitude:

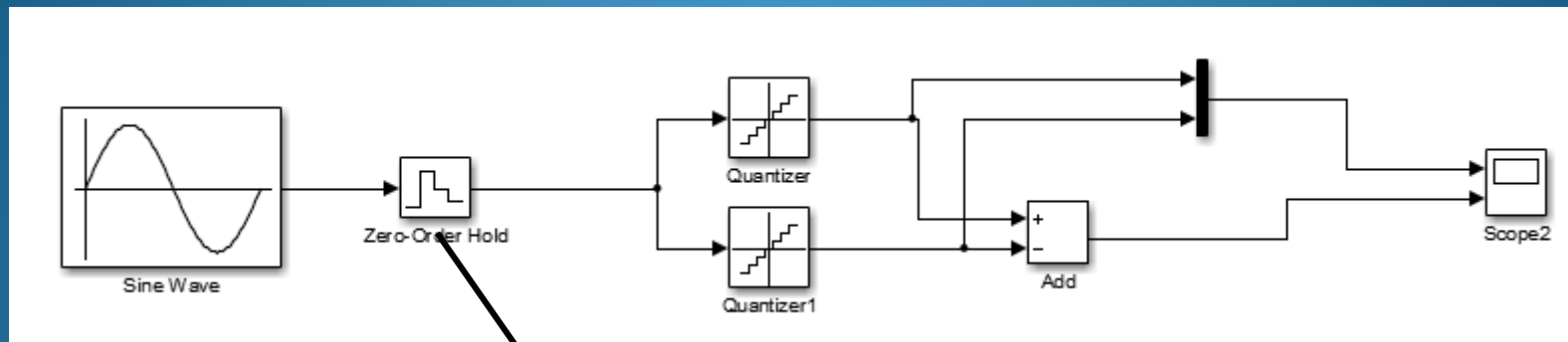
Bias:

Frequency:

Phase (rad):



Conversor AD



Function Block Parameters: Zero-Order Hold

Zero-Order Hold

Zero-order hold.

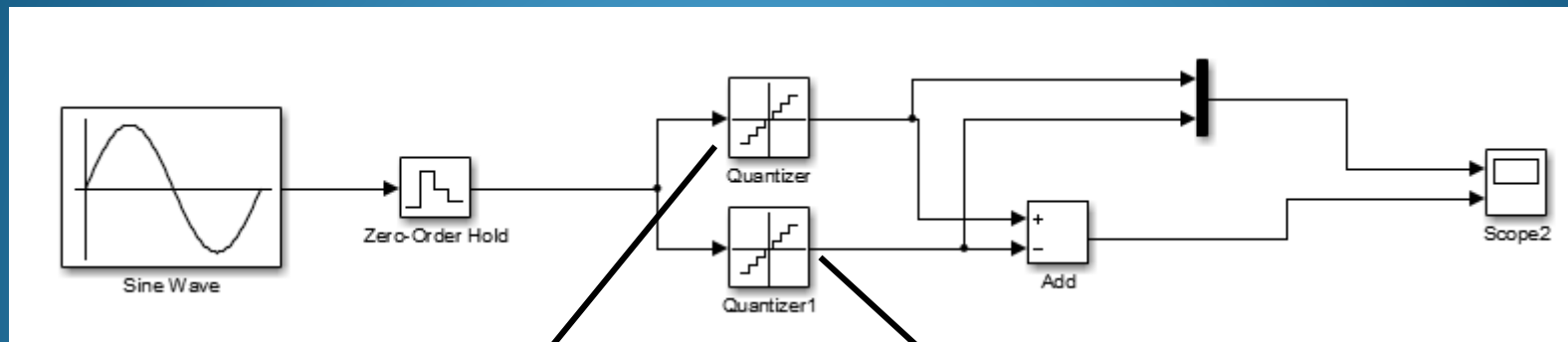
Parameters

Sample time (-1 for inherited):

0.1

OK Cancel Help Apply

Conversor AD



Function Block Parameters: Quantizer

Quantizer

Discretize input at given interval.

Parameters

Quantization interval:

0.0195

☐ Treat as gain when linearizing

Sample time (-1 for inherited):

-1

OK Cancel Help Apply

Function Block Parameters: Quantizer1

Quantizer

Discretize input at given interval.

Parameters

Quantization interval:

0.0012

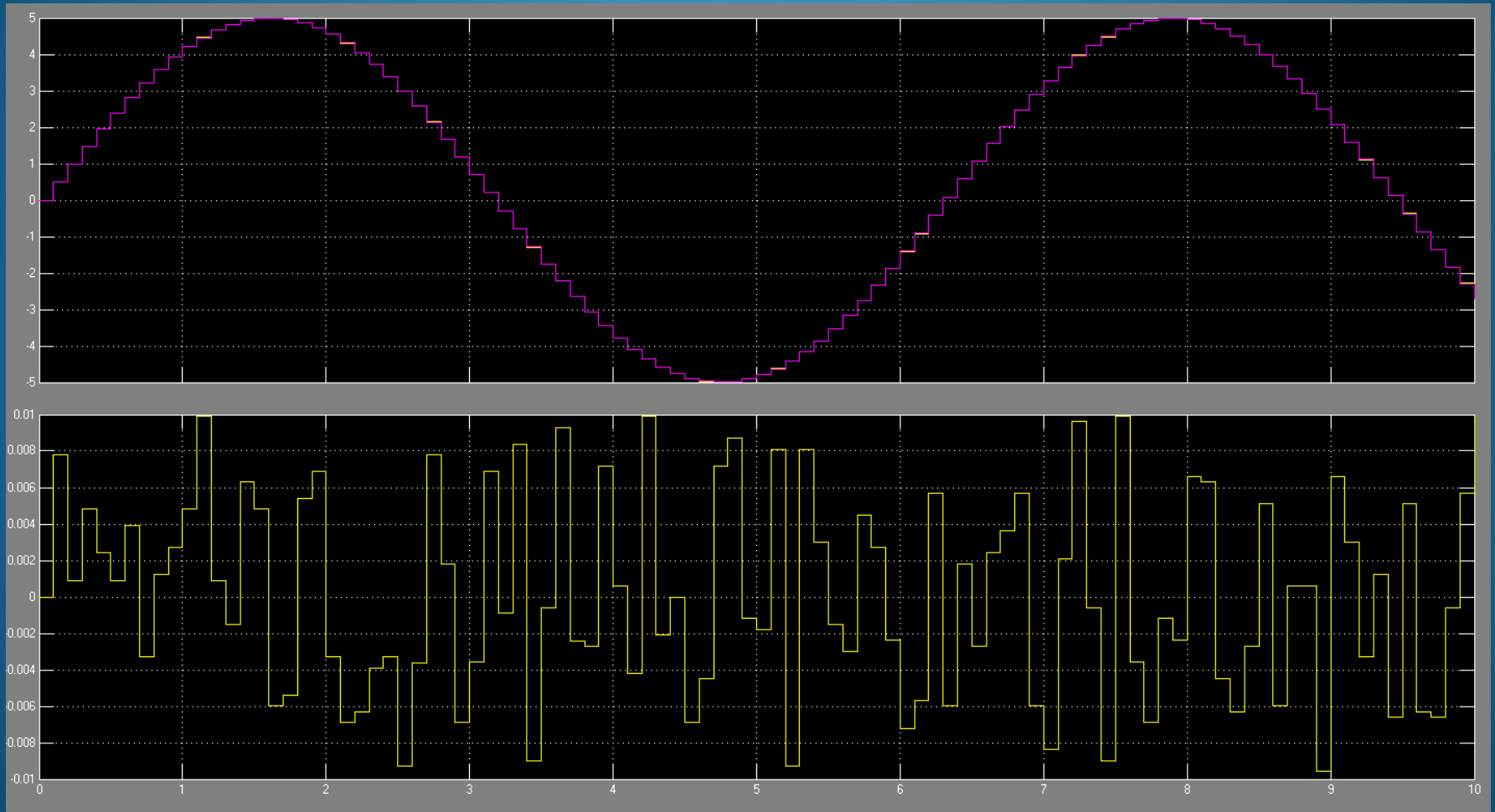
☐ Treat as gain when linearizing

Sample time (-1 for inherited):

-1

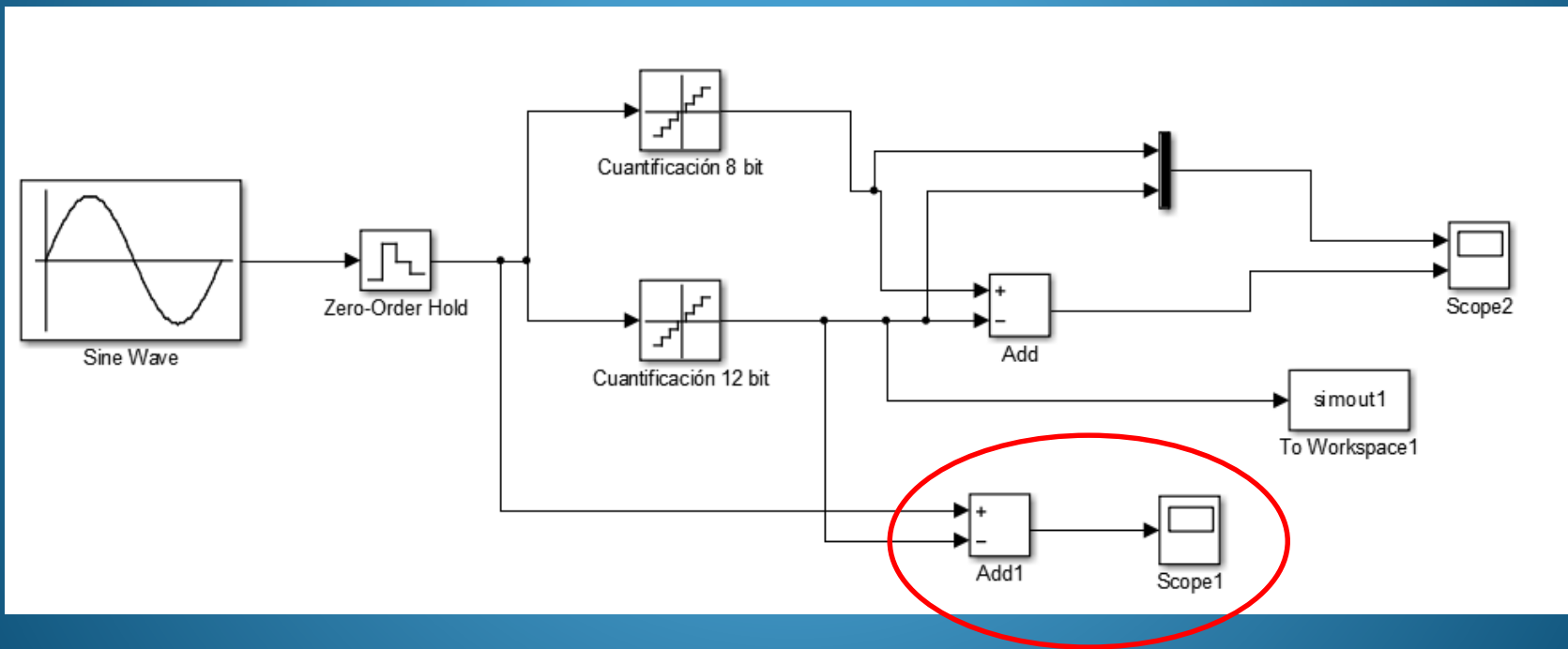
OK Cancel Help Apply

Conversor AD



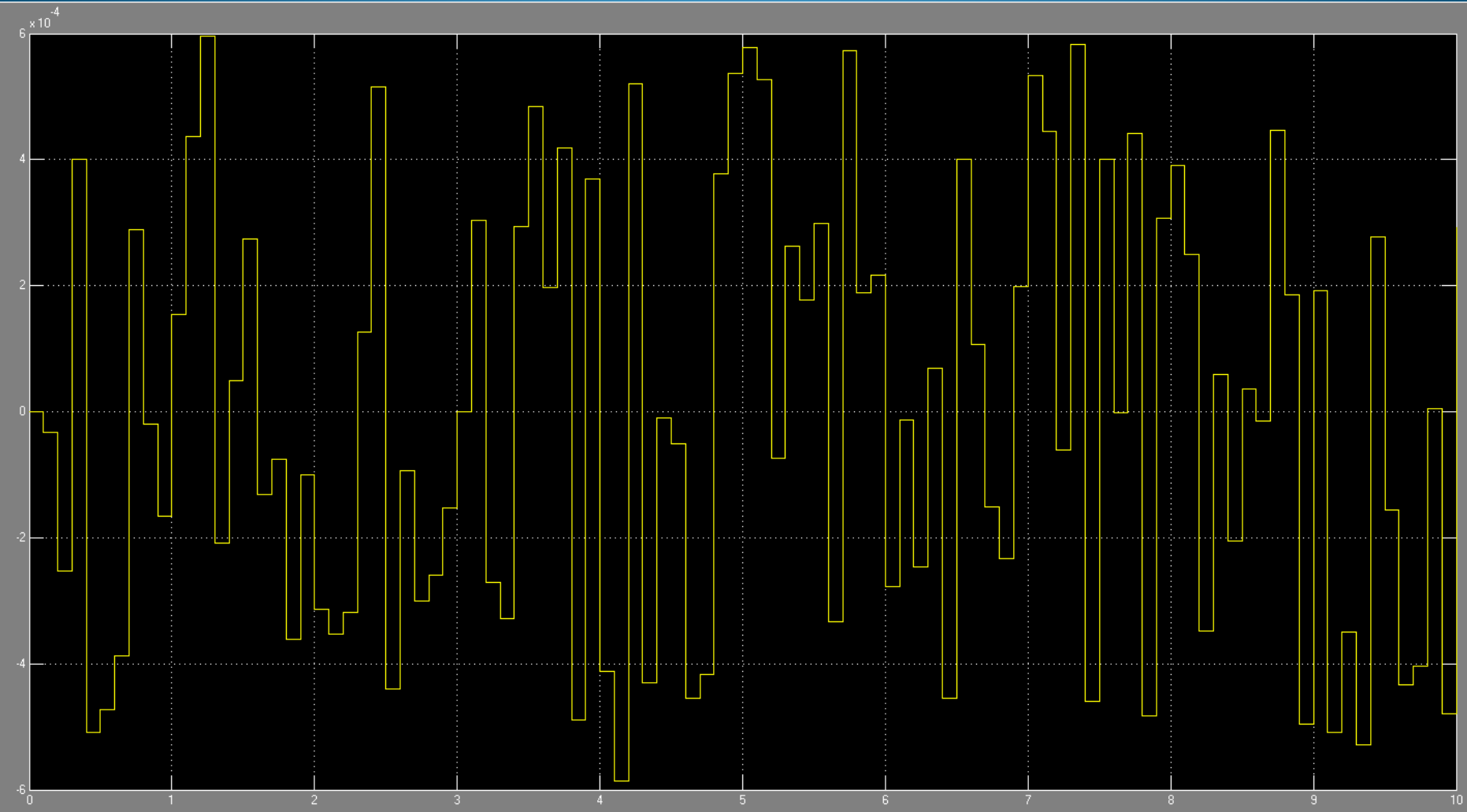
Error de cuantificación 12 bit

Para una señal de 5V el paso es de 0,0012V o 1.2mV.



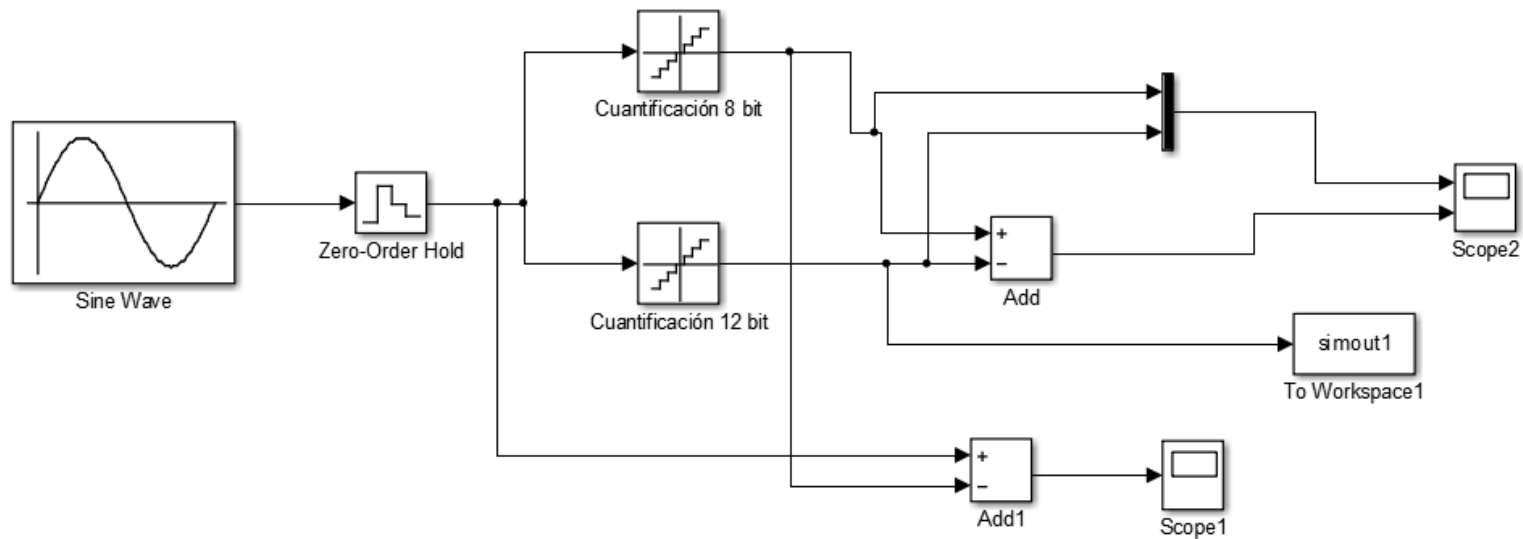
Error para cuantificación de 12 bits

El error se presenta como un ruido blanco

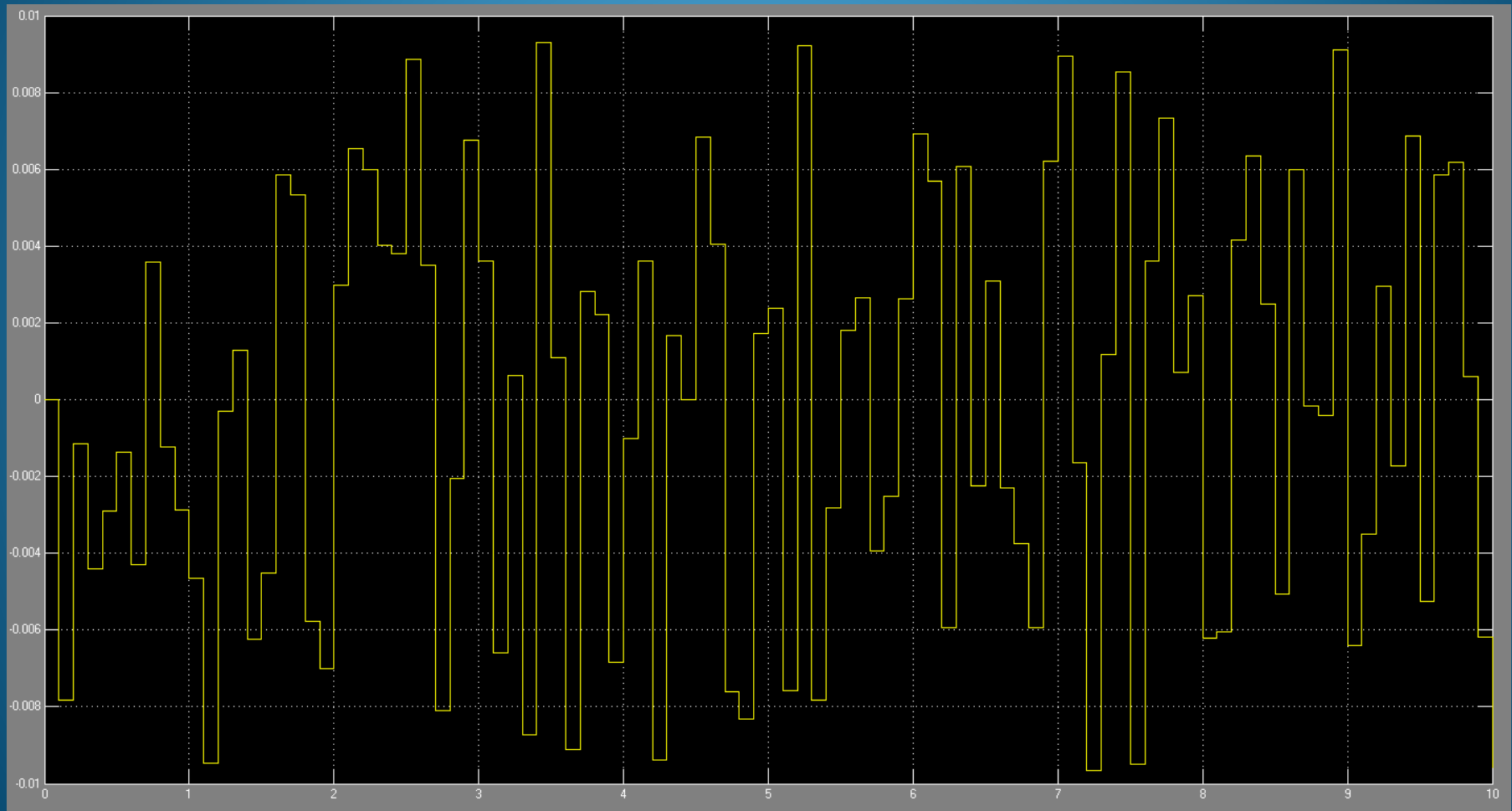


Error de cuantificación 8 bit

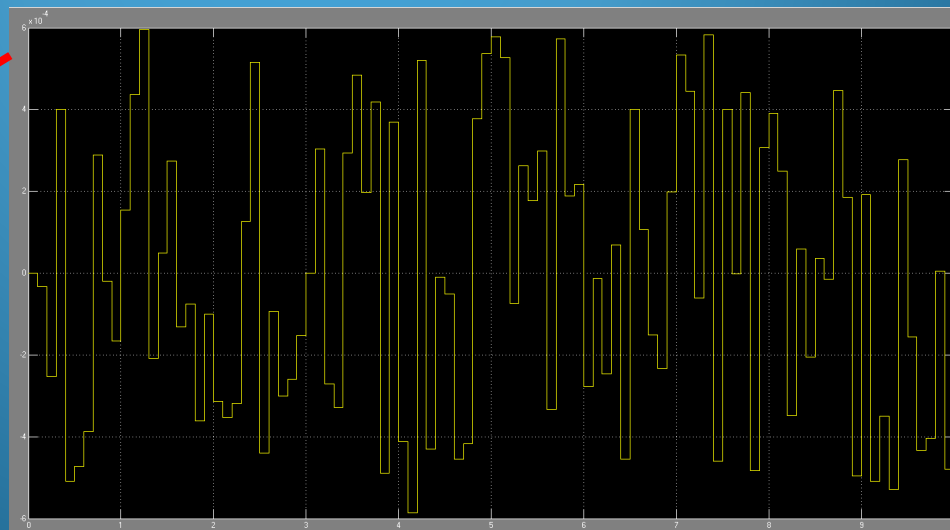
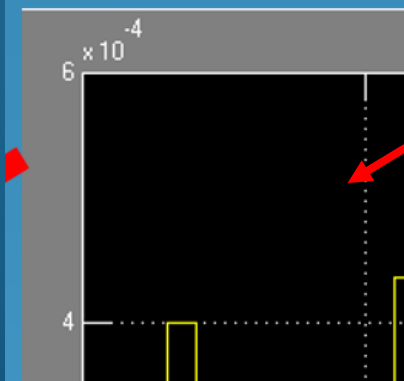
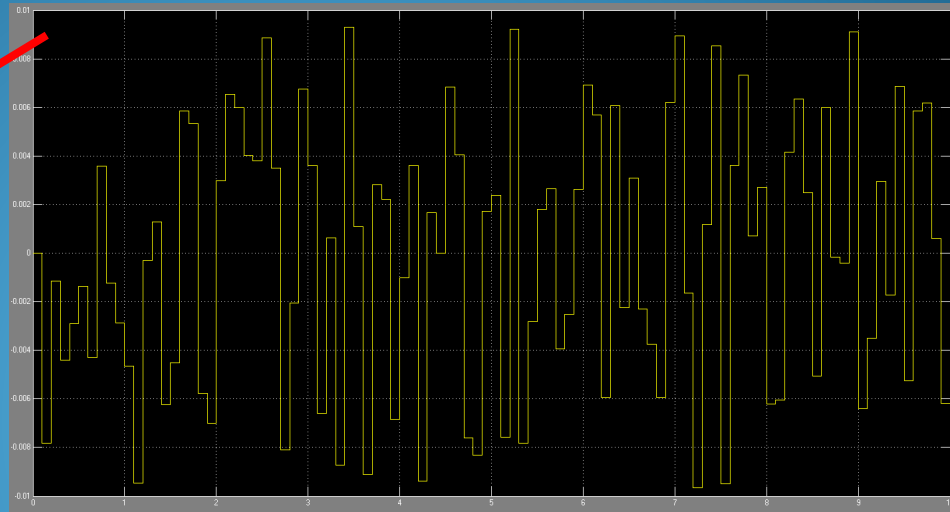
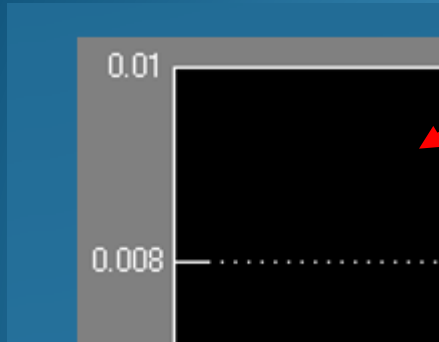
Para una señal de 5V el paso es de 0,0195V o 19,5mV.



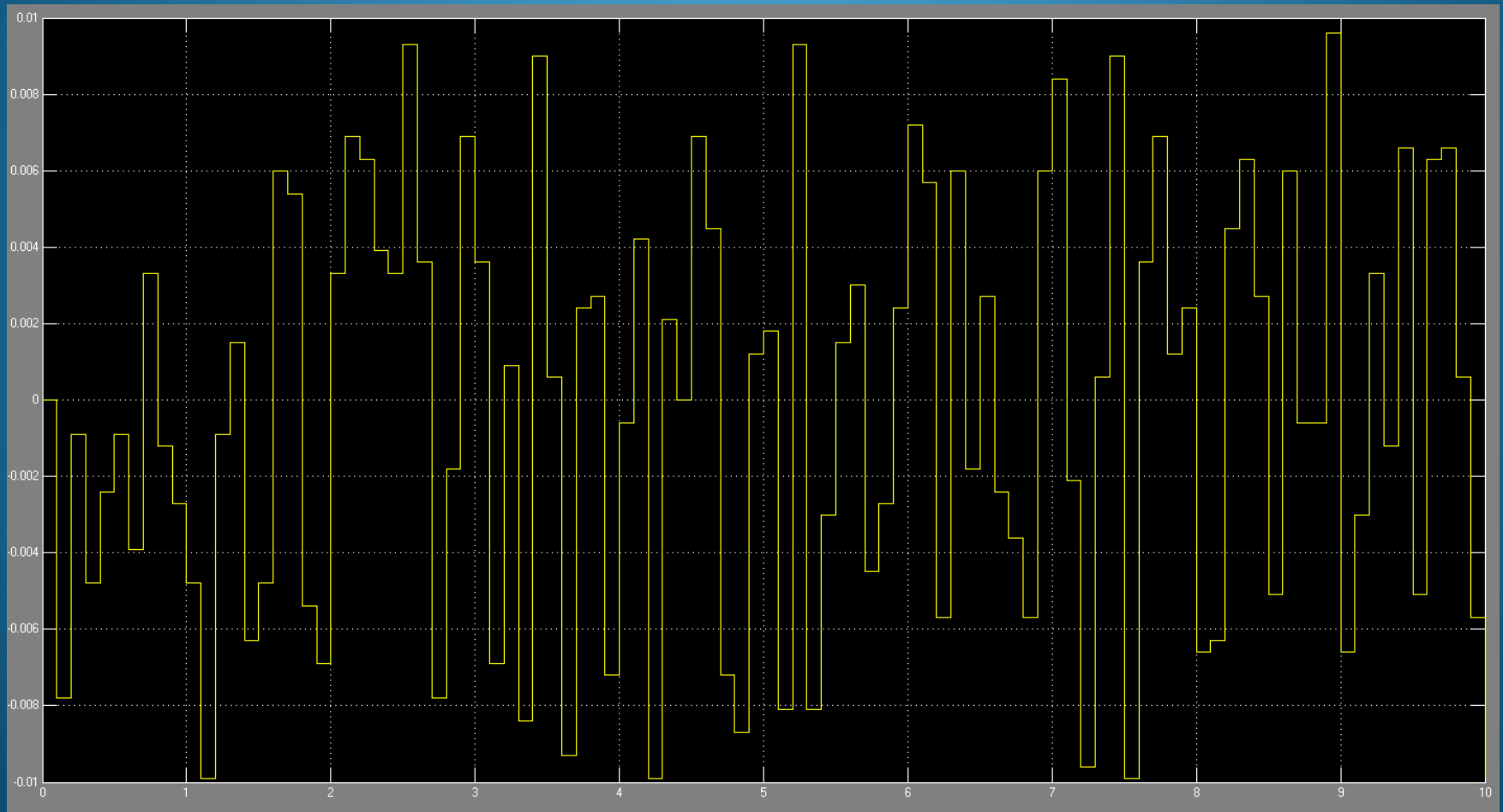
Error para cuantificación de 8 bits



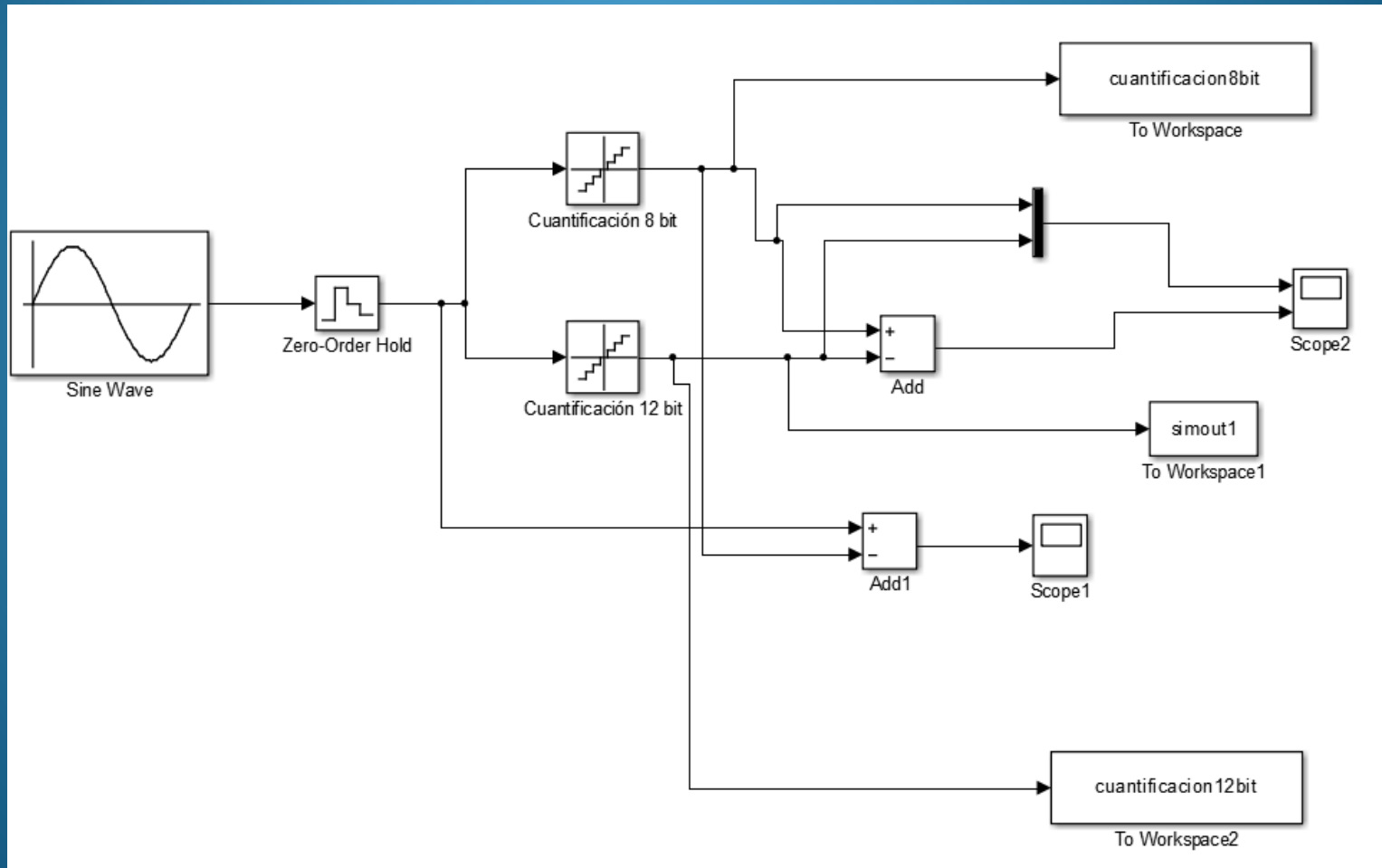
Error para cuantificación de 8 bits



Diferencia entre los errores de cuantificación



Valores numéricos de la cuantificación



Valores numéricos de la

Sink Block Parameters: To Workspace

To Workspace

Write input to specified timeseries, array, or structure in a workspace. For menu-based simulation, data is written in the MATLAB base workspace. Data is not available until the simulation is stopped or paused. For command-line simulation using the `sim` command, the workspace is specified using `DstWorkspace` field in the option structure.

To log a bus signal, use "Timeseries" save format.

Parameters

Variable name:

Limit data points to last:

Decimation:

Sample time (-1 for inherited):

Save format:

☐ Log fixed-point data as a fi object

OK **Cancel** **Help** **Apply**

Valores numéricos de la cuantificación

The image shows the MATLAB R2012b interface. The main window displays a time series plot for the variable 'cuantificacion8bit'. The plot shows a step function over time from 0 to 10 seconds. The y-axis represents the quantized values, ranging from 0 to 3.9195. The x-axis represents time in seconds, ranging from 0 to 10. The plot is titled 'Time series name:'. Below the plot, there are buttons for 'Attributes...', 'Add Row', and 'Delete Rows'. A checkbox labeled 'Show event table' is also present. The 'Current time: uniform 0 to 10 seconds' is displayed. The 'Command Window' at the bottom shows a warning message about the solver used for the simulation.

Current Folder: untitled.mdl.autosave

Variables - cuantificacion8bit

- cuantificacion8bit x cuantificacion12bit x
- cuantificacion8bit <1x1 double timeseries>

Time series name:

Time	Data:1
0	0
0.1000	0.5070
0.2000	0.9945
0.3000	1.4820
0.4000	1.9500
0.5000	2.3985
0.6000	2.8275
0.7000	3.2175
0.8000	3.5880
0.9000	3.9195

☐ Show event table

Attributes... Add Row Delete Rows

Current time: uniform 0 to 10 seconds

Uniform Time Vector...

Command Window

New to MATLAB? Watch this [Video](#), see [Examples](#), or read [Getting Started](#).

explicitly specifying a discrete solver in the solver tab of the Configuration Parameters dialog, or by setting the 'Automatic solver parameter selection' diagnostic to 'none' in the Diagnostics tab of the Configuration Parameters dialog

Warning: The model 'untitled' does not have continuous states, hence Simulink is using the solver 'VariableStepDiscrete' instead of solver 'ode45'. You can disable this diagnostic by explicitly specifying a discrete solver in the solver tab of the Configuration Parameters dialog, or by setting the 'Automatic solver parameter selection' diagnostic to 'none' in the Diagnostics tab of the Configuration Parameters dialog

fx >>

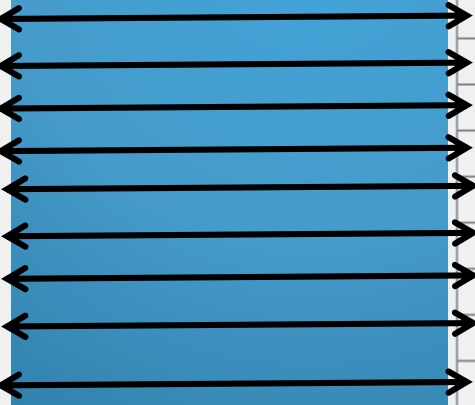
Workspace

Name	Value	Min
cuantificacion12bit	<1x1 double timeseri...>	-4.999
cuantificacion8bit	<1x1 double timeseri...>	-4.992
simout1	<1x1 double timeseri...>	-4.999
tout	<101x1 double>	0

Command History

```
%-- 15/6/2022 17:16 --%
digitalization
simulink
%-- 28/7/2022 15:34 --%
simulink
plot(prueba)
grid on
hold
plot(prueba)
grid on
hold
plot(prueba,'red')
%-- 3/8/2022 21:24 --%
simulink
```

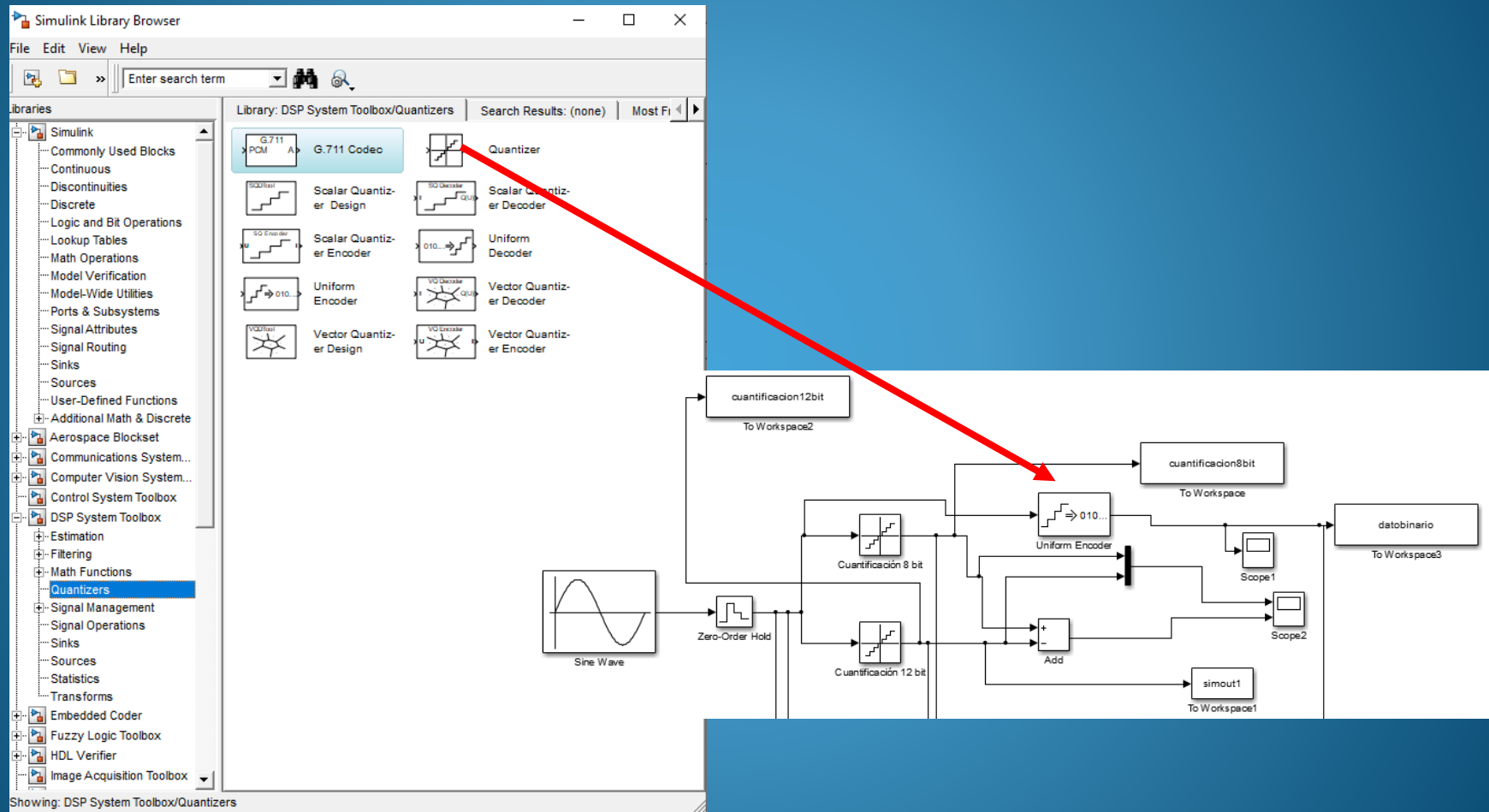
Valores numéricos de la cuantificación



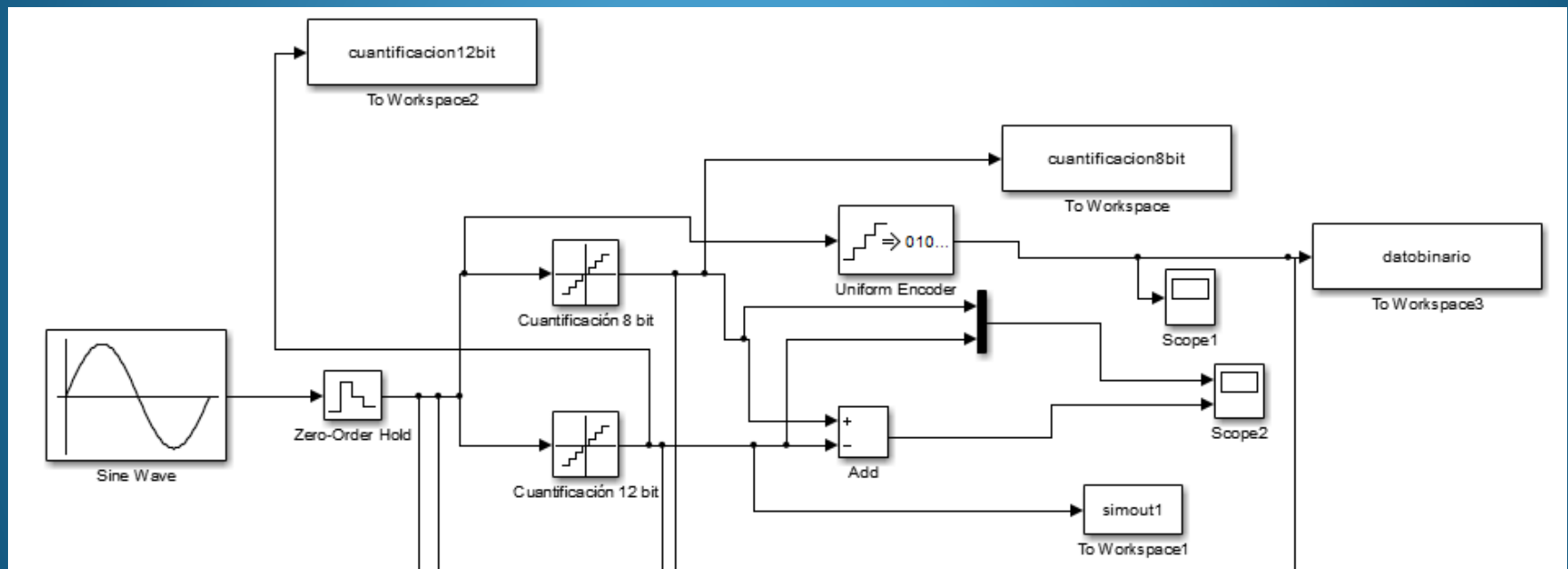
cuantificacion8bit	
cuantificacion8bit <1x1 double timeseries>	
Time series name:	
Time	Data:1
0	0
0.1000	0.5070
0.2000	0.9945
0.3000	1.4820
0.4000	1.9500
0.5000	2.3985
0.6000	2.8275
0.7000	3.2175
0.8000	3.5880
0.9000	3.9195

cuantificacion8bit		cuantificacion12bit	
cuantificacion8bit <1x1 double timeseries>		cuantificacion12bit <1x1 double timeseries>	
Time series name:		Time series name:	
Time	Data:1	Time	Data:1
0	0	0	0
0.1000	0.5070	0.1000	0.4992
0.2000	0.9945	0.2000	0.9936
0.3000	1.4820	0.3000	1.4772
0.4000	1.9500	0.4000	1.9476
0.5000	2.3985	0.5000	2.3976
0.6000	2.8275	0.6000	2.8236
0.7000	3.2175	0.7000	3.2208
0.8000	3.5880	0.8000	3.5868
0.9000	3.9195	0.9000	3.9168

Biblioteca DPS

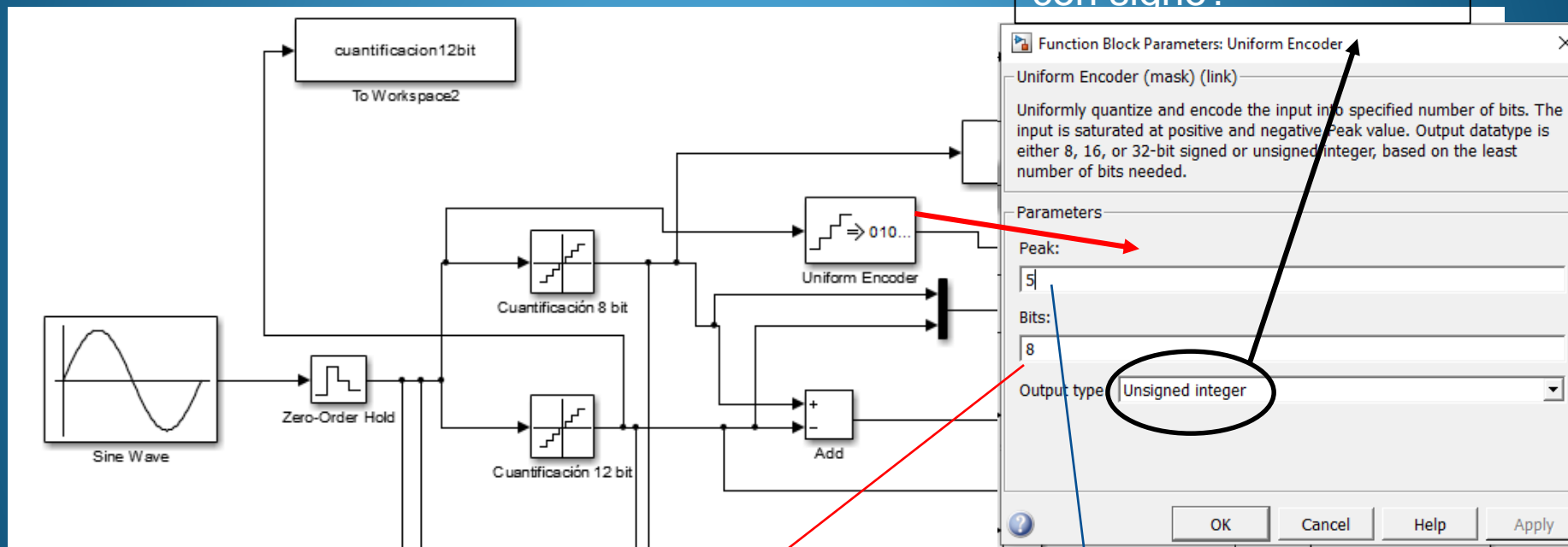


Cuantificación con la biblioteca DSP



Cuantificación con la biblioteca DSP

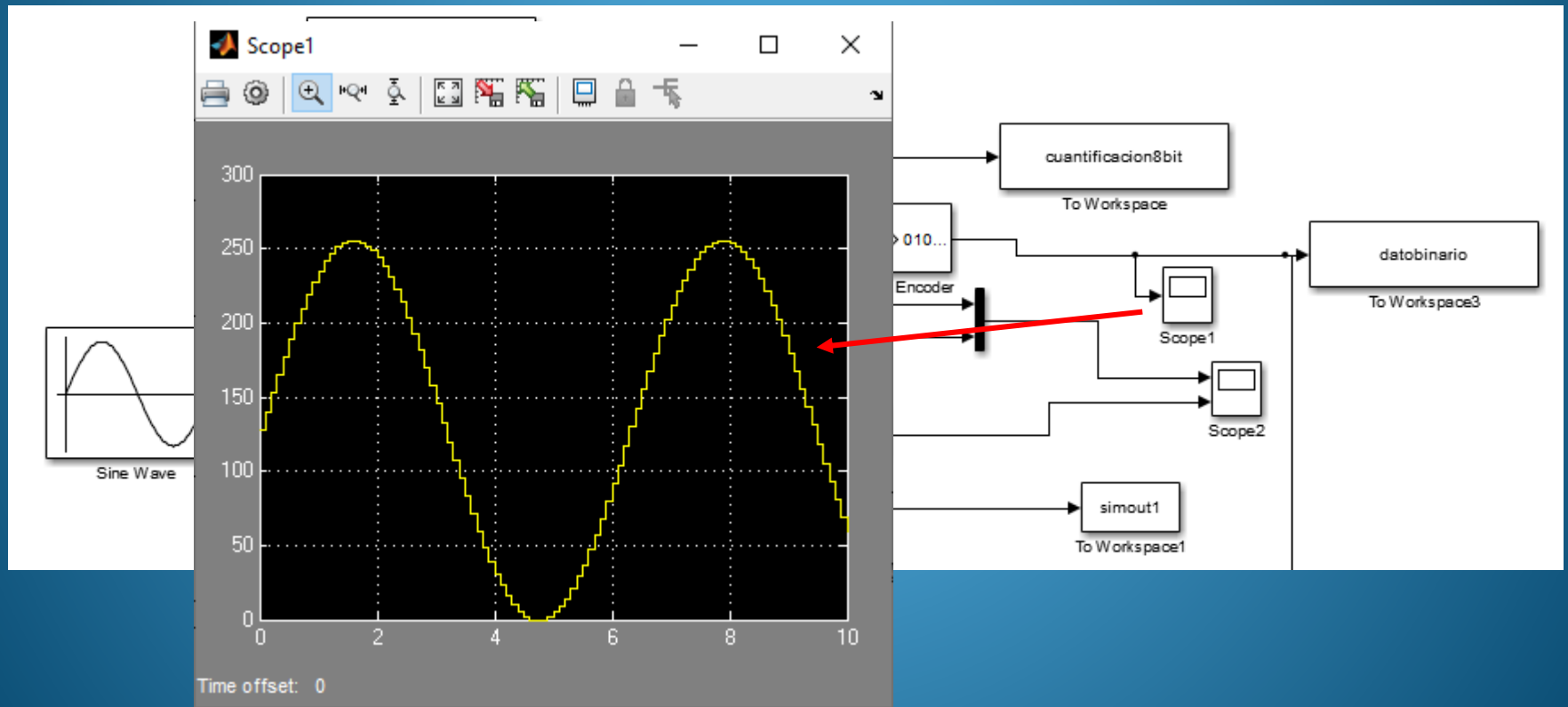
Que numero muestra
con signo?



Numero de Bits

Máxima tensión

Cuantificación de 8 bits con la librería DSP



Cuantificación Dato binario de 8 bits

Variables - datobinario

datobinario x

datobinario <101x1 int

	1	2
89	74	
90	64	
91	52	
92	40	
93	28	
94	15	
95	3	
96	-10	
97	-23	
98	-35	
99	-47	
100	-59	
101	-70	

Con signo

Sin signo

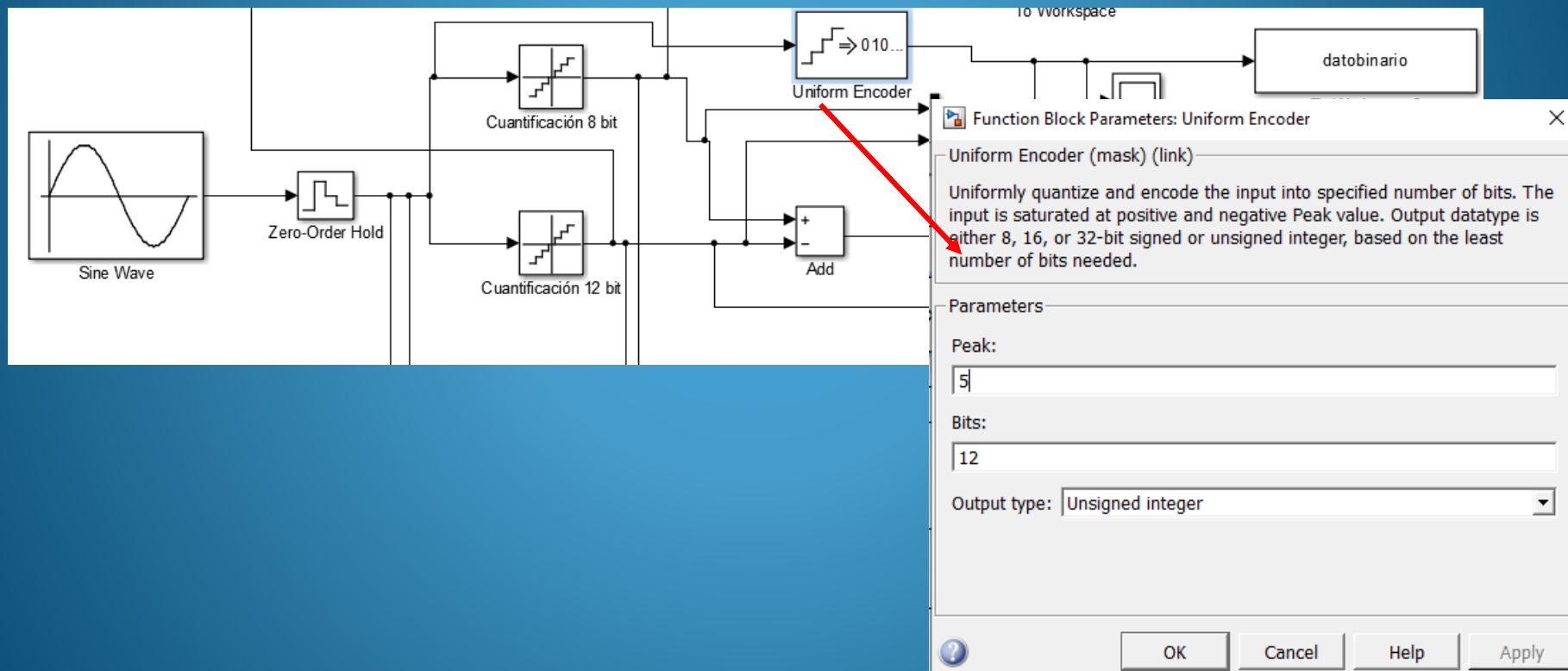
Variables - datobinario

datobinario x

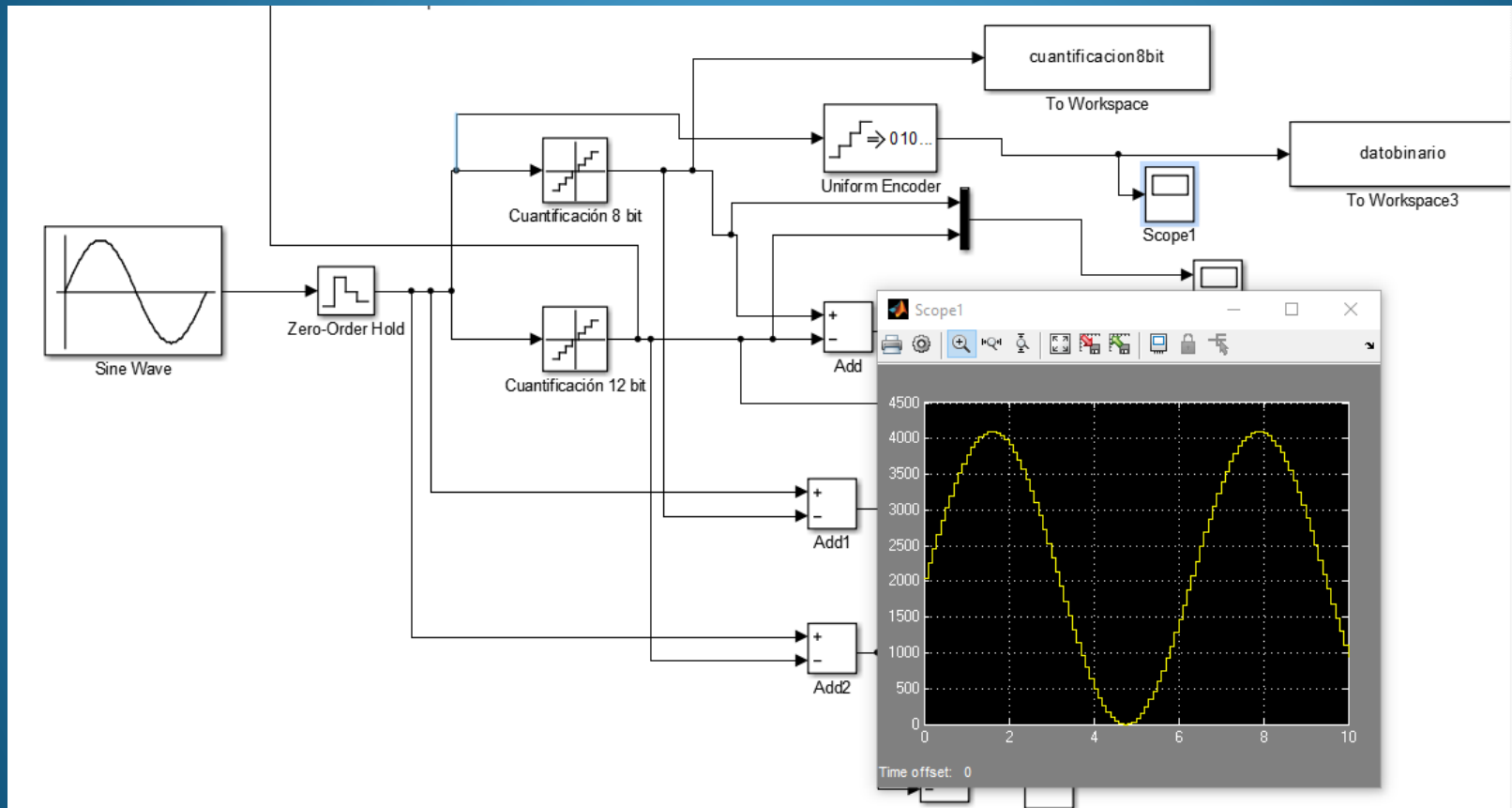
datobinario <101x

	1	
89	202	
90	192	
91	180	
92	168	
93	156	
94	143	
95	131	
96	118	
97	105	
98	93	
99	81	
100	69	
101	58	
102		

Cuantificación de 12 bits



Cuantificación de 12 bits



Cuantificación de 12 bits

Variables - datobinario

datobinario x

datobinario <101x1 int

	1	2
89	1197	
90	1026	
91	844	
92	653	
93	456	
94	254	
95	50	
96	-154	
97	-358	
98	-557	
99	-751	
100	-938	
101	-1115	
102		

Con signo

bin 1111 1011 1010 0101

Sin signo

Variables - datobinario

datobinario x

datobinario <101x1 int

	1	
89	3245	
90	3074	
91	2892	
92	2701	
93	2504	
94	2302	
95	2098	
96	1894	
97	1690	
98	1491	
99	1297	
100	1110	
101	933	
102		

bin 0000 0011 1010 0101