

# Control Digital

## Laboratorio Introductorio

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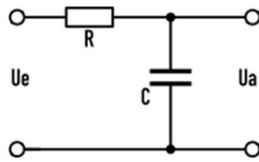
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## CONTENIDO

- Modelos LTI
  - ✓ Primer orden
- Lectura - Escritura de Datos
  - ✓ SIZE Array – INDEX Array – BUILD Array
- Waveforms
  - ✓ Graph – XY Graph Ex

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## Modelos Matemáticos



$$P(s) = \frac{U_a(s)}{U_e(s)}$$

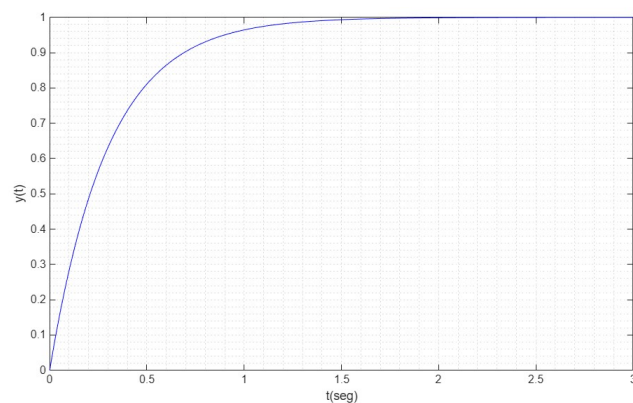
$$G(s) = \frac{K}{\tau s + 1}$$

$$Q(s) = \frac{W(s)}{V(s)}$$

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## Simulación de Modelos MATLAB

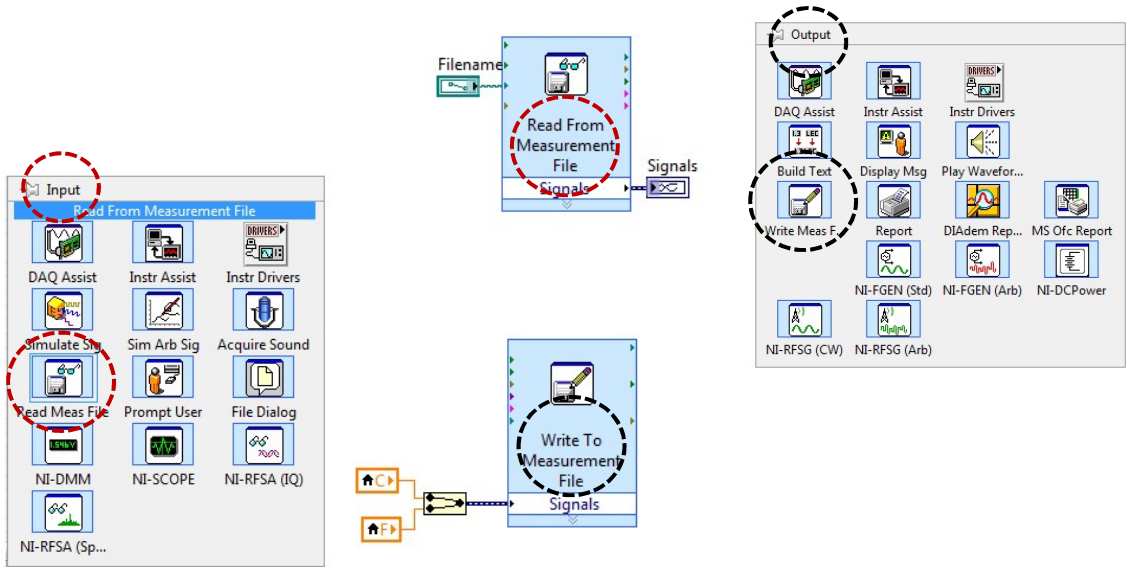
```
clear; close all; clc
K=1;
tau=0.3;
G=tf(K,[tau 1]);
tfin=10*tau;
t=0:0.01:tfin;
u=ones(size(t));
y=lsim(G,u,t);
plot(t,y)
xlabel('t(seg)')
ylabel('y(t)')
grid minor
datos1=[t' y u'];
save data11.lvm datos1 -ascii -tabs
```



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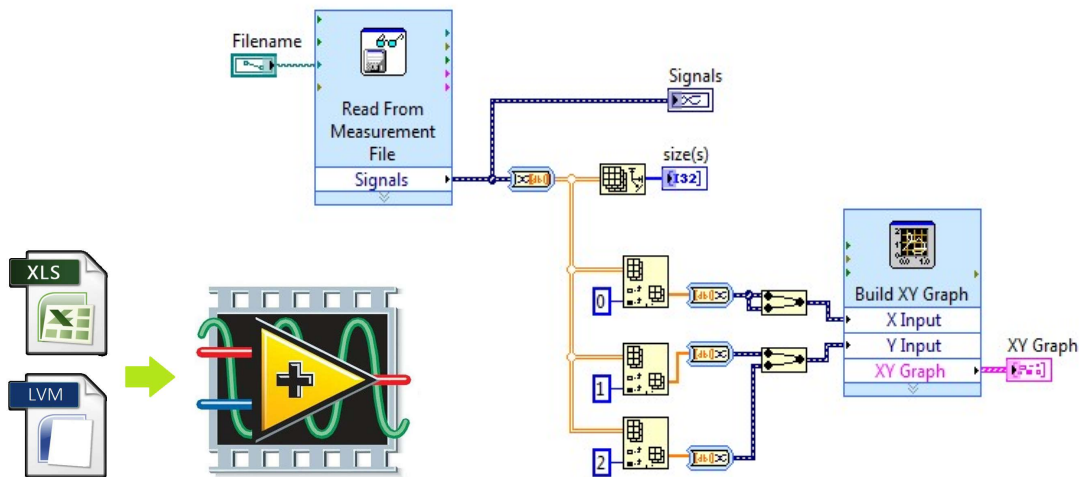


Lectura – Escritura de Datos



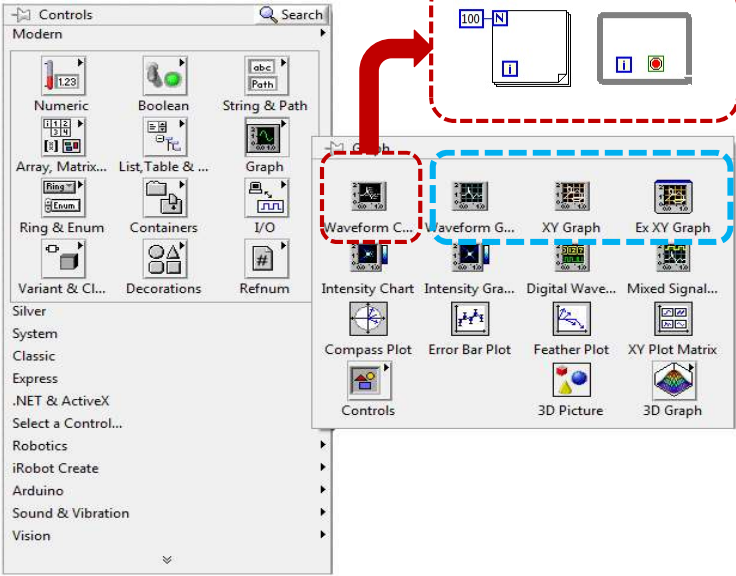
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Lectura de Datos con ARRAYS



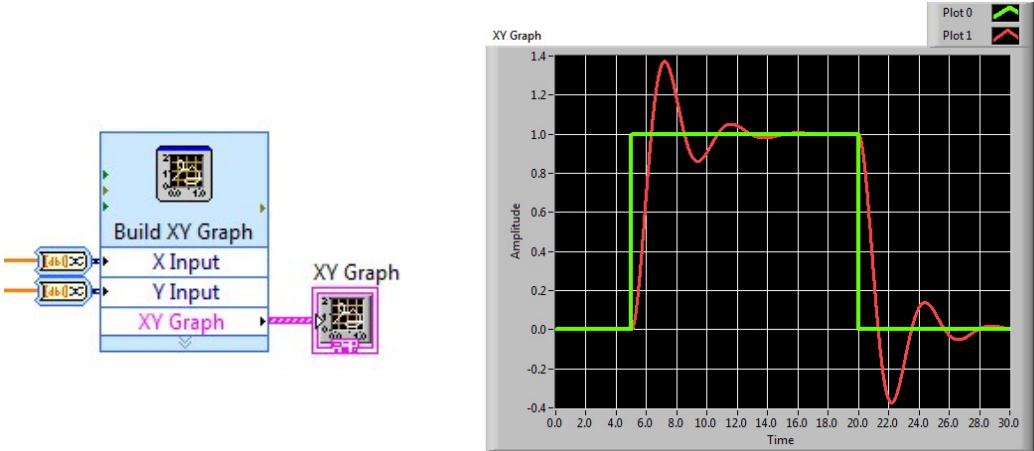
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Waveforms



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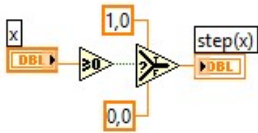
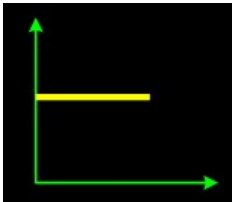
Waveform XY Graph



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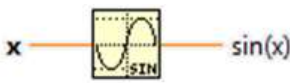
# Funciones Matemáticas

Función Escalón Unitario

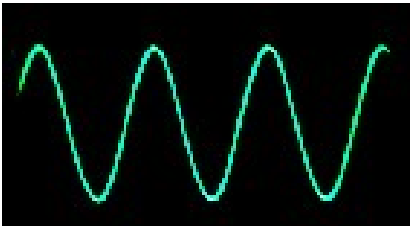


$$step(x) = \begin{cases} 1 & x \geq 0 \\ 0 & x < 0 \end{cases}$$

Función Seno



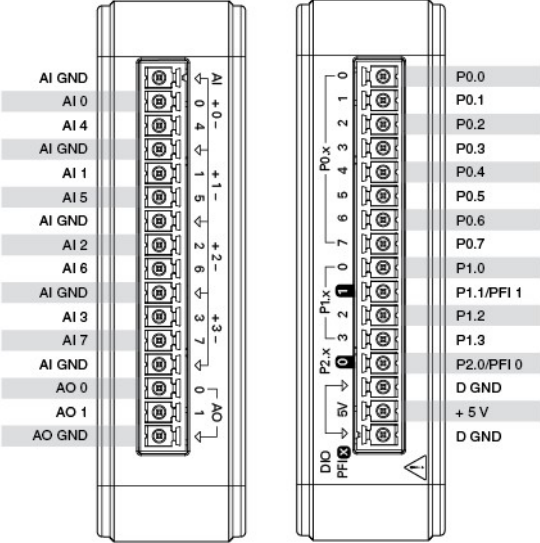
$$\sin(x) = A \sin(\omega x + \varphi)$$



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LEFT VIEW

RIGHT VIEW



## DAQ 6002/6003



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# Arduino UNO

Source: Fritzing

# DAC MCP4725

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