

INGENIERÍA MECATRÓNICA



DI_CERO

DIEGO CERVANTES RODRÍGUEZ

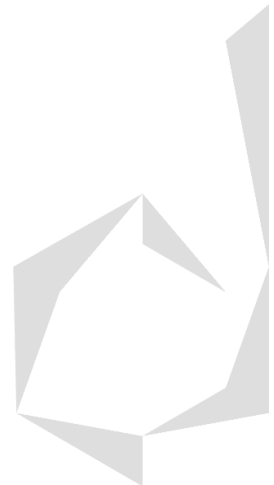
AUTOMATIZACIÓN INDUSTRIAL: PRÁCTICA

ISP SOFT Y COMMGR

3: Funciones Lógicas Básicas en un PLC

Contenido

Desarrollo:.....	2
1. AND	2
2. OR.....	3
3. NAND.....	4
4. NOR	5
5. XOR.....	6
6. Función Compuesta con Tabla de verdad.....	6



Desarrollo:

Por medio del programa ISPSOft se realizarán las funciones lógicas básicas utilizando un PLC.

FUNCIONES LÓGICAS BÁSICAS

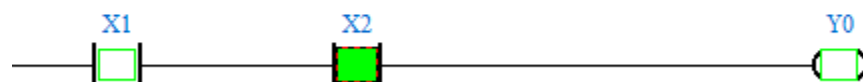
NOMBRE	AND - Y	OR - O	XOR O-exclusiva	NOT Inversor	NAND	NOR																																																																																	
SÍMBOLO																																																																																							
SÍMBOLO																																																																																							
TABLA DE VERDAD	<table><tr><th>a</th><th>b</th><th>z</th></tr><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></table>	a	b	z	0	0	0	0	1	0	1	0	0	1	1	1	<table><tr><th>a</th><th>b</th><th>z</th></tr><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></table>	a	b	z	0	0	0	0	1	1	1	0	1	1	1	1	<table><tr><th>a</th><th>b</th><th>z</th></tr><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>0</td></tr></table>	a	b	z	0	0	0	0	1	1	1	0	1	1	1	0	<table><tr><th>a</th><th>z</th></tr><tr><td>0</td><td>1</td></tr><tr><td>1</td><td>0</td></tr></table>	a	z	0	1	1	0	<table><tr><th>a</th><th>b</th><th>z</th></tr><tr><td>0</td><td>0</td><td>1</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>0</td></tr></table>	a	b	z	0	0	1	0	1	1	1	0	1	1	1	0	<table><tr><th>a</th><th>b</th><th>z</th></tr><tr><td>0</td><td>0</td><td>1</td></tr><tr><td>0</td><td>1</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>0</td></tr></table>	a	b	z	0	0	1	0	1	0	1	0	0	1	1	0
a	b	z																																																																																					
0	0	0																																																																																					
0	1	0																																																																																					
1	0	0																																																																																					
1	1	1																																																																																					
a	b	z																																																																																					
0	0	0																																																																																					
0	1	1																																																																																					
1	0	1																																																																																					
1	1	1																																																																																					
a	b	z																																																																																					
0	0	0																																																																																					
0	1	1																																																																																					
1	0	1																																																																																					
1	1	0																																																																																					
a	z																																																																																						
0	1																																																																																						
1	0																																																																																						
a	b	z																																																																																					
0	0	1																																																																																					
0	1	1																																																																																					
1	0	1																																																																																					
1	1	0																																																																																					
a	b	z																																																																																					
0	0	1																																																																																					
0	1	0																																																																																					
1	0	0																																																																																					
1	1	0																																																																																					
EQUIVALENTE EN CONTACTOS																																																																																							
AXIOMA	$z = a \cdot b$	$z = a + b$	$z = \bar{a} \cdot b + a \cdot \bar{b}$	$z = \bar{a}$	$z = \overline{a \cdot b}$	$z = \overline{a + b}$																																																																																	

1. AND

Network 1



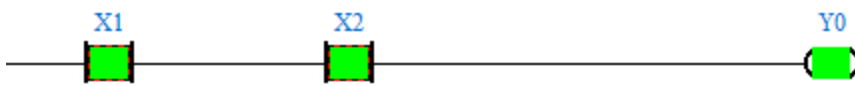
Network 1



Network 1

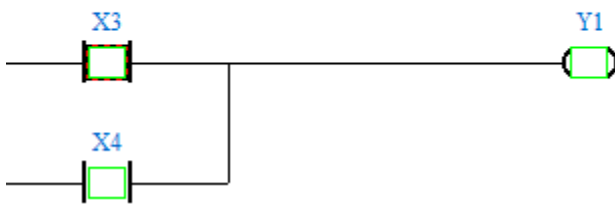


[-] Network 1

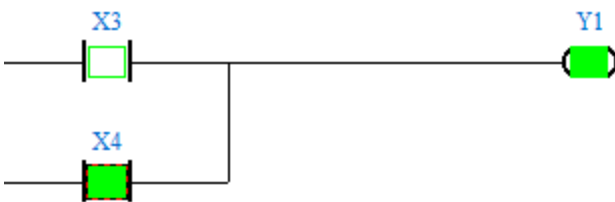


2. OR

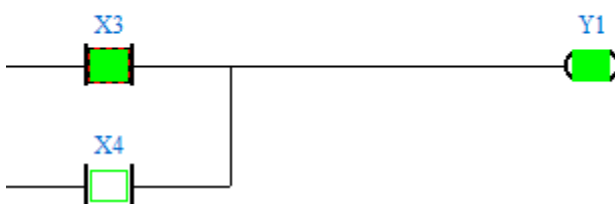
[-] Network 2



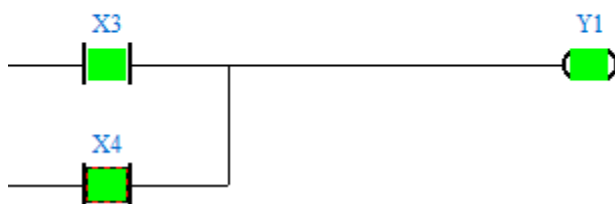
[-] Network 2



[-] Network 2

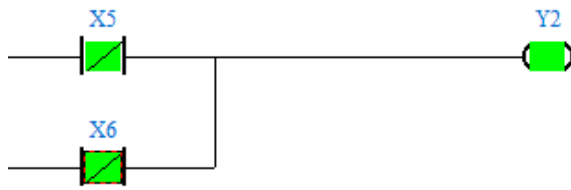


[-] Network 2

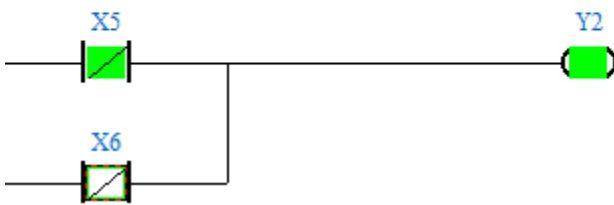


3. NAND

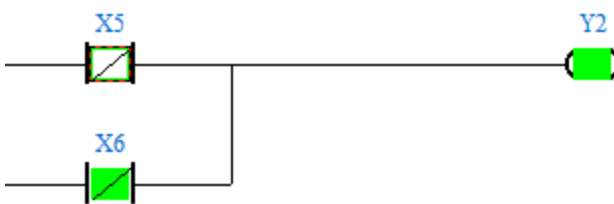
Network 3



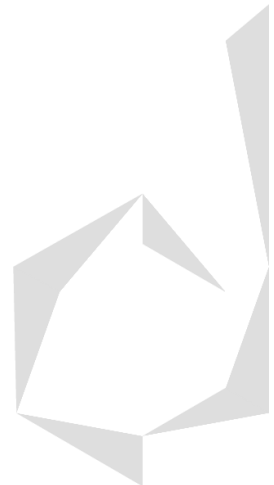
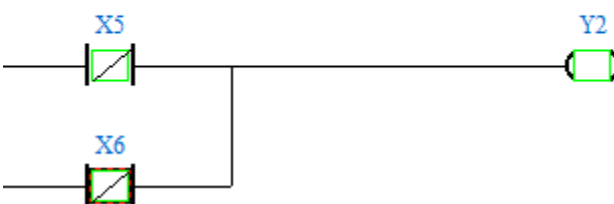
Network 3



Network 3



Network 3

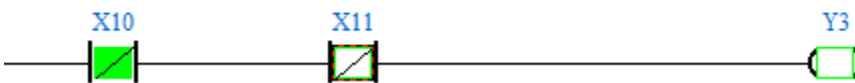


4. NOR

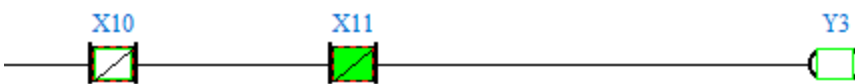
[-] Network 4



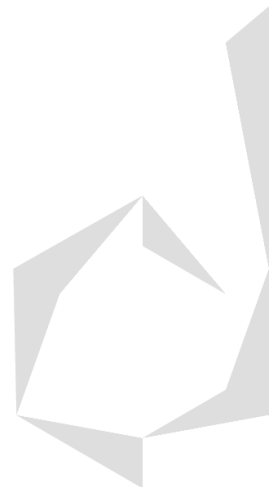
[-] Network 4



[-] Network 4

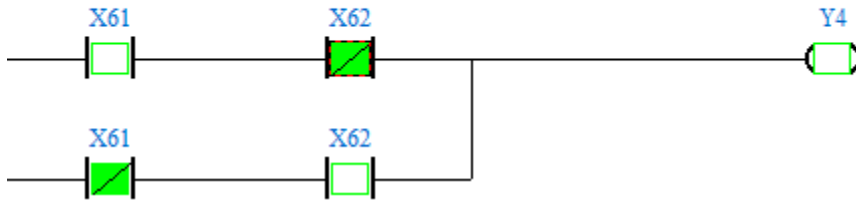


[-] Network 4

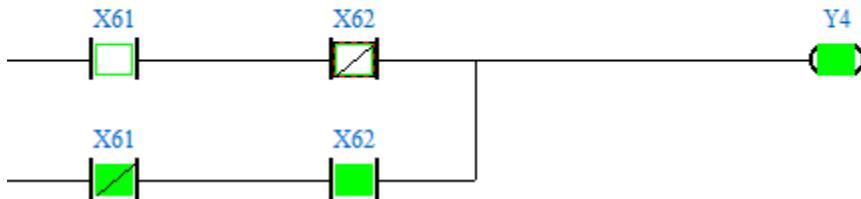


5. XOR

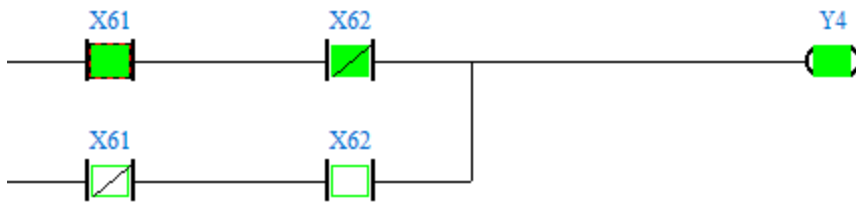
Network 5



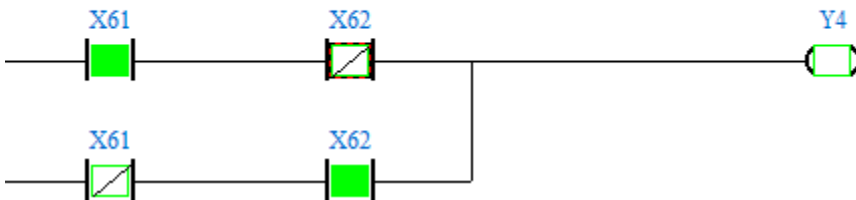
Network 5



Network 5



Network 5



6. Función Compuesta con Tabla de verdad

"Se cuenta con tres botones de pulso y tres lámparas etiquetadas como H1, H2 y H3. Al presionar un botón de pulso, no importa cual, se enciende H1. Al presionar dos botones de pulso, no importa la combinación de botones, se enciende la lámpara H2, al presionar los tres botones

se enciende la lámpara H3 y en caso de no tener ningún botón oprimido, ninguna lámpara deberá encender."

S1	S2	S3	H1, H2, H3
0	0	0	0, 0, 0
0	0	1	1, 0, 0
0	1	0	1, 0, 0
0	1	1	1, 1, 0
1	0	0	1, 0, 0
1	0	1	1, 1, 0
1	1	0	1, 1, 0
1	1	1	1, 1, 1

Resultado:

H1 = S1 OR S2 OR S3

H2 = (S2ANDS3) OR (S1ANDS3) OR (S1ANDS2)

H3 = S1 AND S2 AND S3

