

ANEXO 1. TABLAS DE VARIABLES TIA PORTAL

En la Tabla 1 se encuentran las variables utilizadas tanto en el Factory IO como en el TIA Portal para las entradas y salidas.

Nombre Factory IO	Nombre TIA Portal	Entrada/Salida PLC
Pallet at entry	DET_1	%I0.0
Pallet at exit	DET_2	%I0.1
Pallet loaded	DET_3	%I0.2
Box at entry	CEL_1	%I0.3
Pusher limit	DET_4	%I0.4
Plate limit NPN	DET_5	%I0.5
Clamped	DET_6	%I0.6
Elevator moving	DET_7	%I0.7
Retroreflective Sensor 12	CEL_2	%I1.0
Diffuse Sensor 1	CEL_3	%I1.1
Diffuse Sensor 2	CEL_4	%I1.2
Emergency stop	SETA_EMERGENCIA	%I1.3
Diffuse Sensor 4	CEL_5	%I1.4
FACTORY I/O (Running)		%I1.5
Diffuse Sensor 5	CEL_6	%I1.6
Retroreflective Sensor 4	CEL_7	%I1.7
Retroreflective Sensor 5	CEL_8	%I2.0
Retroreflective Sensor 6	CEL_9	%I2.1
Retroreflective Sensor 7	CEL_10	%I2.2
Retroreflective Sensor 8	CEL_11	%I2.3
Retroreflective Sensor 10	CEL_12	%I2.4
Retroreflective Sensor 11	CEL_13	%I2.5
Stacker Crane 1 Middle Limit	DET_8	%I2.6
Stacker Crane 1 Left Limit	DET_9	%I2.7
Stacker Crane 1 Right Limit	DET_10	%I3.0
Turntable 1 (Front Limit)	DET_11	%I3.1
Turntable 1 (Limit 90)	DET_12	%I3.2
-	DET_14	%I3.3
Two-Axis Pick & Place (Detected)	DET_13	%I3.4
Pallet feeder	M_1	%Q0.0
Load pallet	M_2	%Q0.1
Exit conveyor	M_3	%Q0.2
Move to limit	S_1	%Q0.3
Elevator up	S_2	%Q0.4
Elevator down	S_3	%Q0.5
Box feeder	M_4	%Q0.6
Turn	P_1	%Q0.7
Push	P_2	%Q1.0
Load belt	M_5	%Q1.1
Clamp	P_3	%Q1.2
Open plate	P_4	%Q1.3
Warning light	LUZ_EMERGENCIA	%Q1.4
Two-Axis Pick & Place 1 X	Q_6	%Q1.5

Conveyor Scale 1 (+)	M_6.1	%Q1.6
Conveyor Scale 1 (-)	M_6.2	%Q1.7
Two-Axis Pick & Place 1 Z	Q_7	%Q2.0
Belt Conveyor (2m) 1	M_8	%Q2.1
Belt Conveyor (4m) 2	M_9	%Q2.2
Belt Conveyor (4m) 3	M_10	%Q2.3
Belt Conveyor (4m) 4	M_11	%Q2.4
Belt Conveyor (4m) 5	M_12	%Q2.5
Two-Axis Pick & Place Rotate CW	Q_8	%Q2.6
Turntable 1 Turn	M_22	%Q2.7
Turntable 1 Roll (+)	M_23	%Q3.0
Loading Conveyor 1	M_13	%Q3.1
Loading Conveyor 2	M_14	%Q3.2
Pivot Arm Sorter 1 Turn	P_5	%Q3.3
Pivot Arm Sorter 2 Turn	P_6	%Q3.4
Pivot Arm Sorter 3 Turn	P_7	%Q3.5
Pivot Arm Sorter 1 Belt (+)	M_15.1	%Q3.6
Pivot Arm Sorter 1 Belt (-)	M_15.2	%Q3.7
Pivot Arm Sorter 2 Belt (+)	M_16.1	%Q4.0
Pivot Arm Sorter 2 Belt (-)	M_16.2	%Q4.1
Pivot Arm Sorter 3 Belt (+)	M_17.1	%Q4.2
Pivot Arm Sorter 3 Belt (-)	M_17.2	%Q4.3
Two-Axis Pick & Place 1(Grab)	Q_9	%Q4.4
Two-Axis Pick & Place 1 Rotate CCW	Q_10	%Q4.5
Roller Conveyor (2m) 1	M_18	%Q4.6
Roller Conveyor (2m) 2	M_19	%Q4.7
Roller Conveyor (2m) 3	M_20	%Q5.0
Roller Conveyor (4m) 3	M_21	%Q5.1
Stacker Crane 1 (Left)	Q_4	%Q5.2
Stacker Crane 1 (Right)	Q_5	%Q5.3
Stop Blade 1	P_8	%Q5.4
Conveyor Scale 1 Weight (V)	Peso	%ID30
Light Array Emitter 1 (V)	Altura	%ID34
Stacker Crane 1 X Position (V)	Eje_X	%ID38
Stacker Crane 1 Z Position (V)	Eje_Z	%ID42
Stacker Crane 1 X Set Point (V)	Eje_X_Objetivo	%QD30
Stacker Crane 1 Z Set Point (V)	Eje_Z_Objetivo	%QD34

Tabla 1. Variables de entrada y salida utilizadas en TIA Portal

Los números asignados en la Tabla 2 corresponden a las siguientes acciones:

- 0: Nada
- 1: Introducir Fila
- 2: Introducir Piso
- 3: Activar Volteador
- 4 Desactivar volteador
- 5: Entrada Pale
- 6: Salida Pale

Variable	Valor
Programa[0]	5
Programa[1]	0
Programa[2]	1
Programa[3]	0
Programa[4]	1
Programa[5]	0
Programa[6]	2
Programa[7]	3
Programa[8]	0
Programa[9]	1
Programa[10]	0
Programa[11]	0
Programa[12]	2
Programa[13]	4
Programa[14]	1
Programa[15]	0
Programa[16]	1
Programa[17]	0
Programa[18]	2
Programa[19]	3
Programa[20]	0
Programa[21]	1
Programa[22]	0
Programa[23]	0
Programa[24]	2
Programa[25]	4
Programa[26]	1
Programa[27]	0
Programa[28]	1
Programa[29]	0
Programa[30]	2
Programa[31]	3
Programa[32]	0
Programa[33]	1
Programa[34]	0
Programa[35]	0
Programa[36]	6

Tabla 2. Mosaico utilizado para el paletizador.

En la Tabla 3 se encuentran todos los temporizadores utilizados con sus respectivos tiempos.

Temporizador	Tiempo
T_1	1s
T_2	4s
T_3	4s
T_4	4s
T_5	1s
T_6	1s
T_7	1s

T_8	1s
T_9	7s
T_10	500ms
T_11	500ms
T_12	1s
T_20	9s
T_21	1s
T_22	500ms
T_23	1s
T_30	3s
T_31	3s
T_32	1s 800ms
T_40	1s
T_41	1s
T_50	1s
T_51	2s
T_60	1s
T_61	2s
T_62	10s
T_63	4s
T_70	1s
T_71	8s
T_80	1s
T_81	1s
T_82	3s
T_92	3s
T_93	5s
T_200	2s
T_201	2s
T_202	2s

Tabla 3. Todos los temporizadores con sus respectivos tiempos.