K··Project

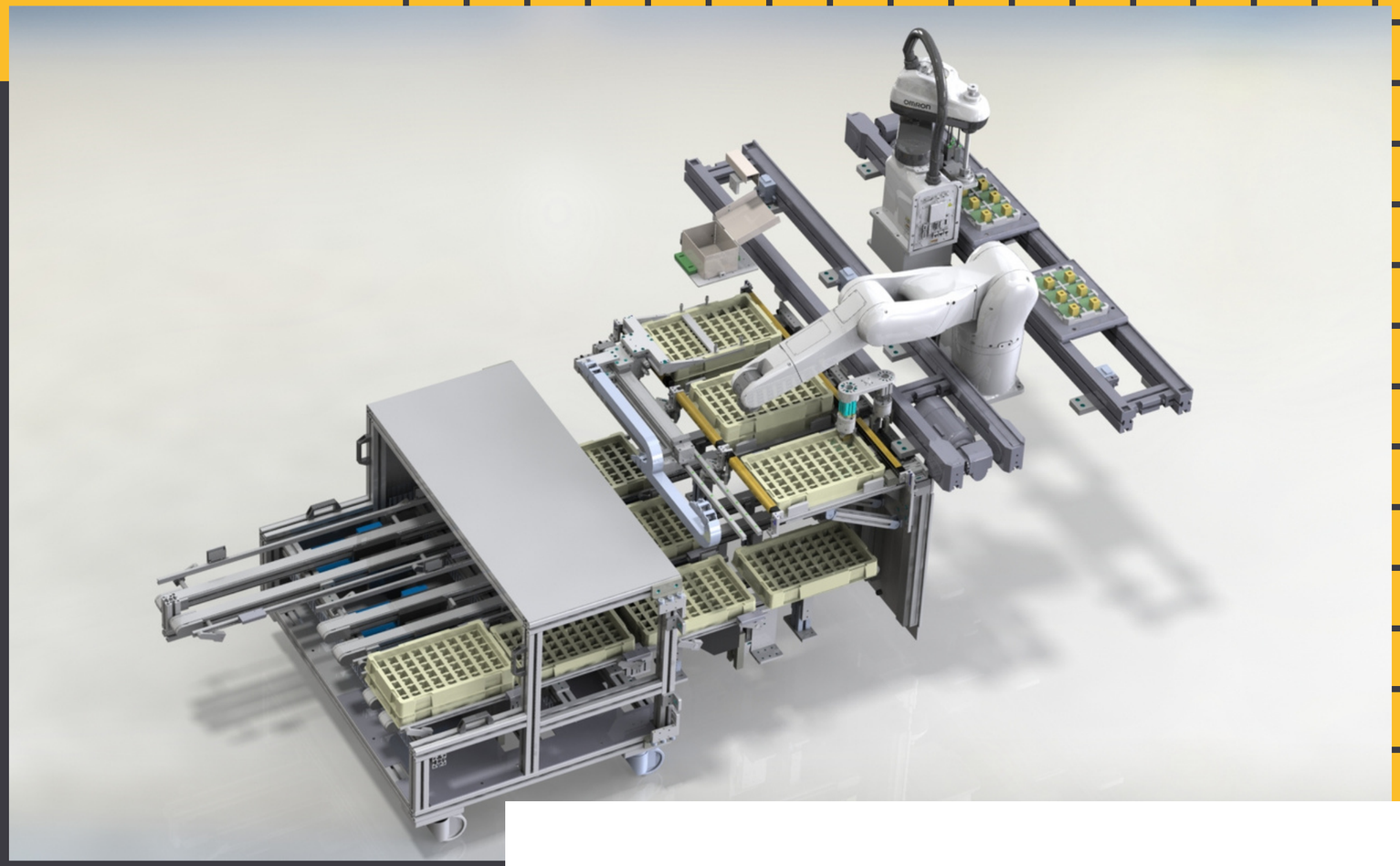
GEMELOS DIGITALES

Diseño de un módulo de DENSO-TEN

UNIVERSIDAD DE MÁLAGA

ÍNDICE

¿Qué hemos logrado?



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011001
100101
110100
011000
001011
110010
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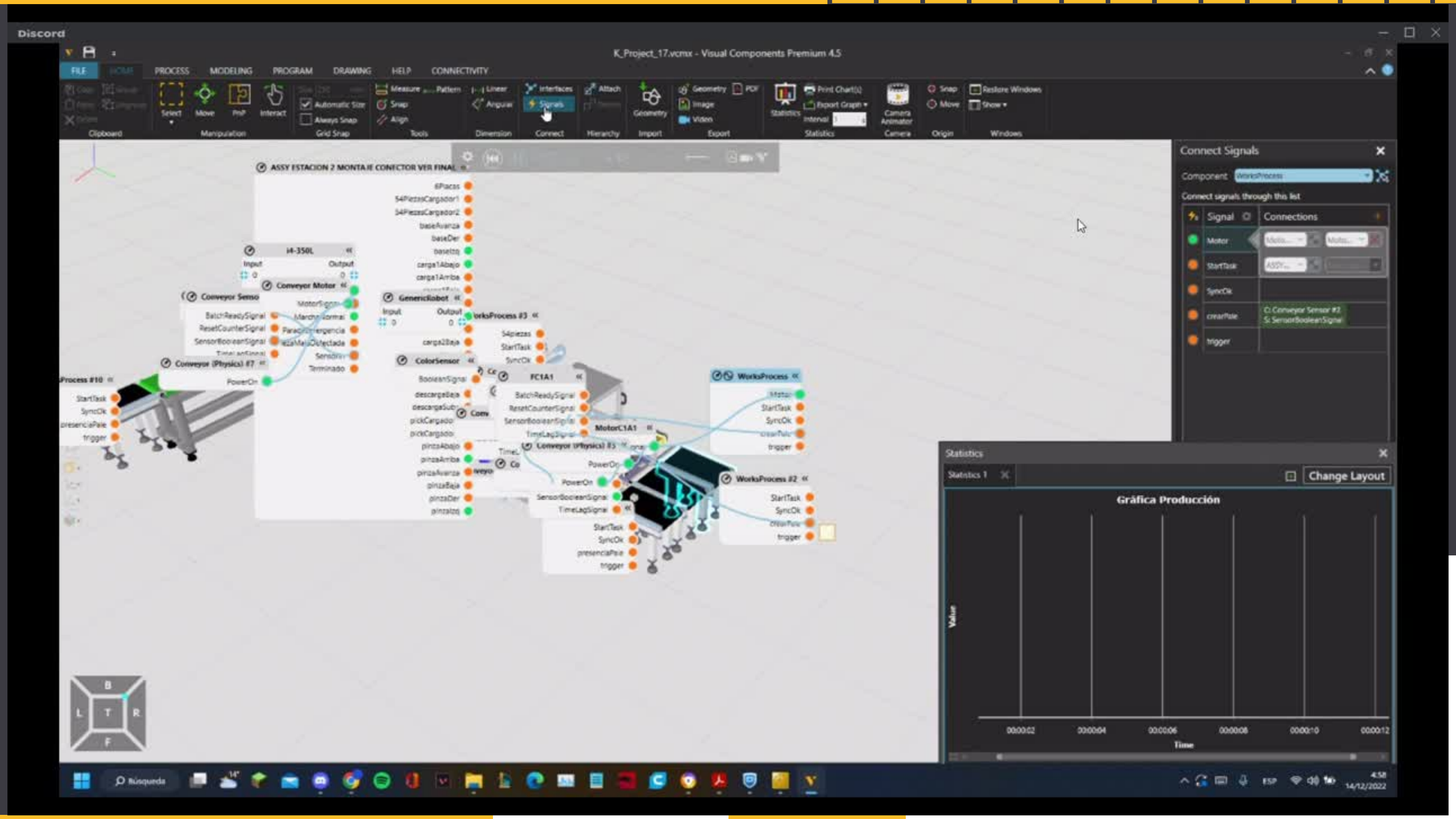
0100010000010000000111001011110



01100
10010
01100
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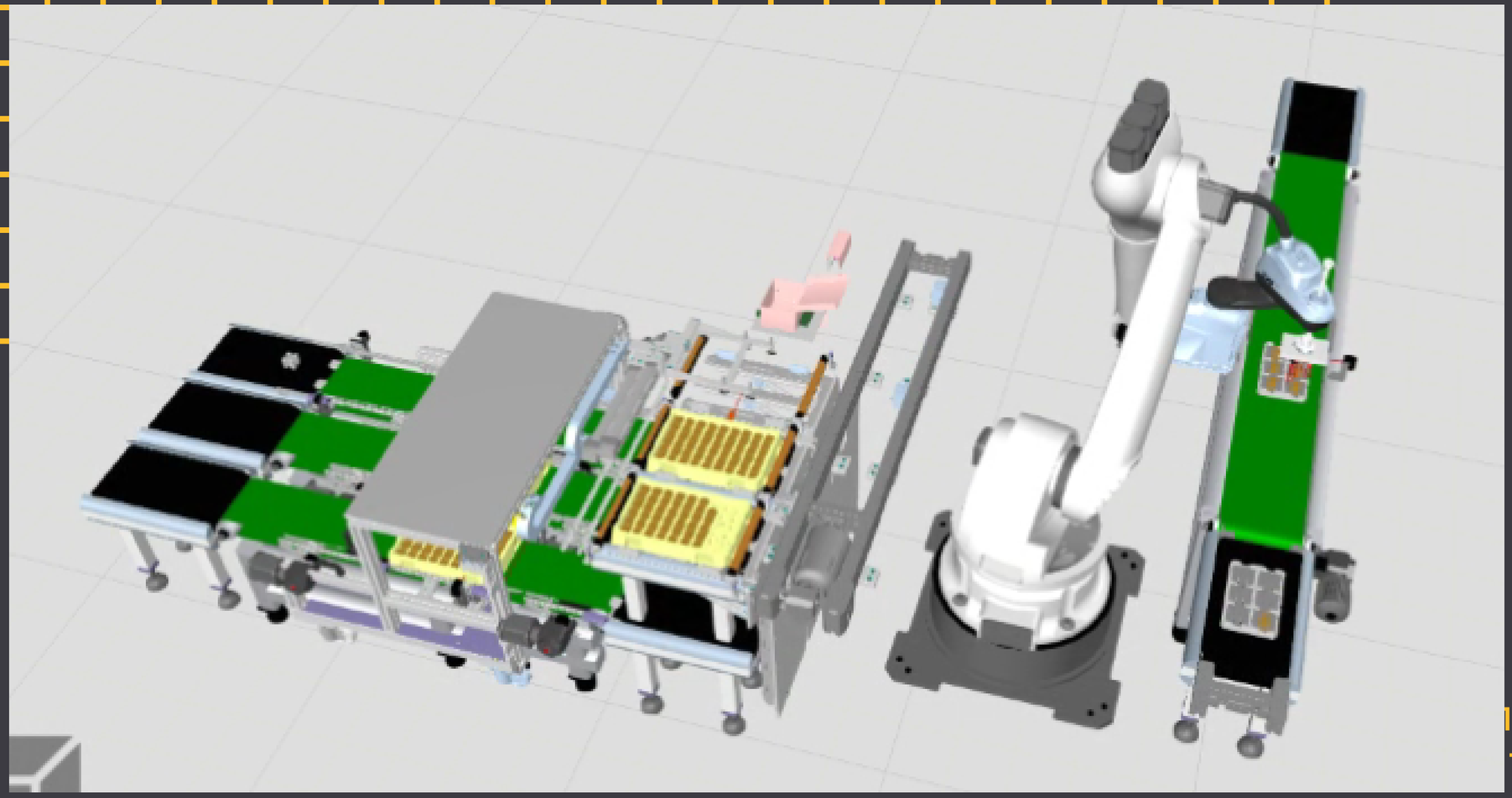
11010
01100
00101
11001
00101111110111111101011100100111010100010000010000000011100101110

Layout

MODELADO Y FLUJO DE TRABAJO

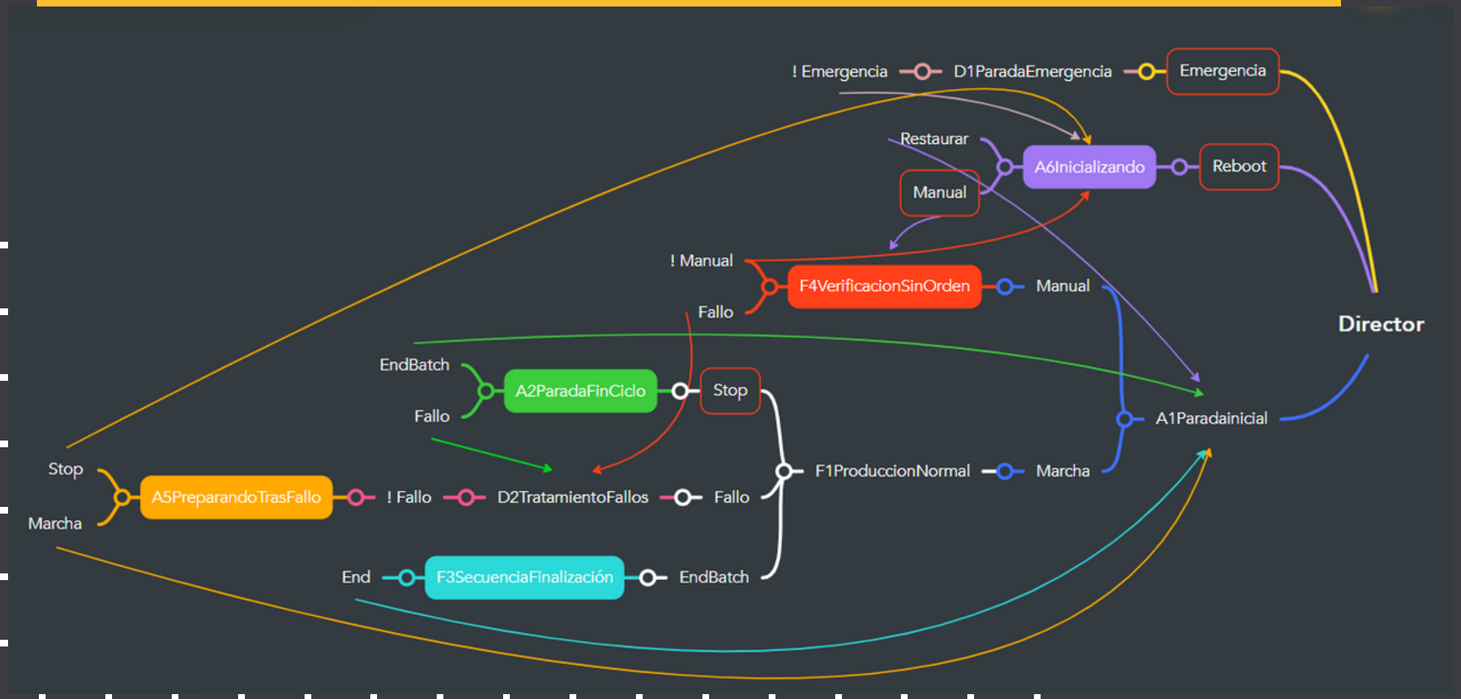


1

2

Alimentación

Arquitectura




```
CASE Mode OF
    // ARRÊT
    A1ParadaInicial:
    IF Manual THEN
        Mode := F4VerificacionSinOrden;
    ELSIF Go THEN
        Mode := F1ProduccionNormal;
    END_IF

    A2ParaFinCiclo:
    IF Fail THEN
        ModeAns := A2ParaFinCiclo;
        Mode    := D2TratamientoFallos;
    ELSIF EndBatch THEN
        Mode := A1ParadaInicial;
    END_IF

    A5PreparandoTrasFallo:
    IF Go THEN
        Mode := A1ParadaInicial;
    ELSIF Stop THEN
        Mode := A6Inicializando;
    END_IF

    A6Inicializando:
    IF Restore THEN
        Mode := A1ParadaInicial;
    ELSIF Manual THEN
        Mode := F4VerificacionSinOrden;
    END_IF
```

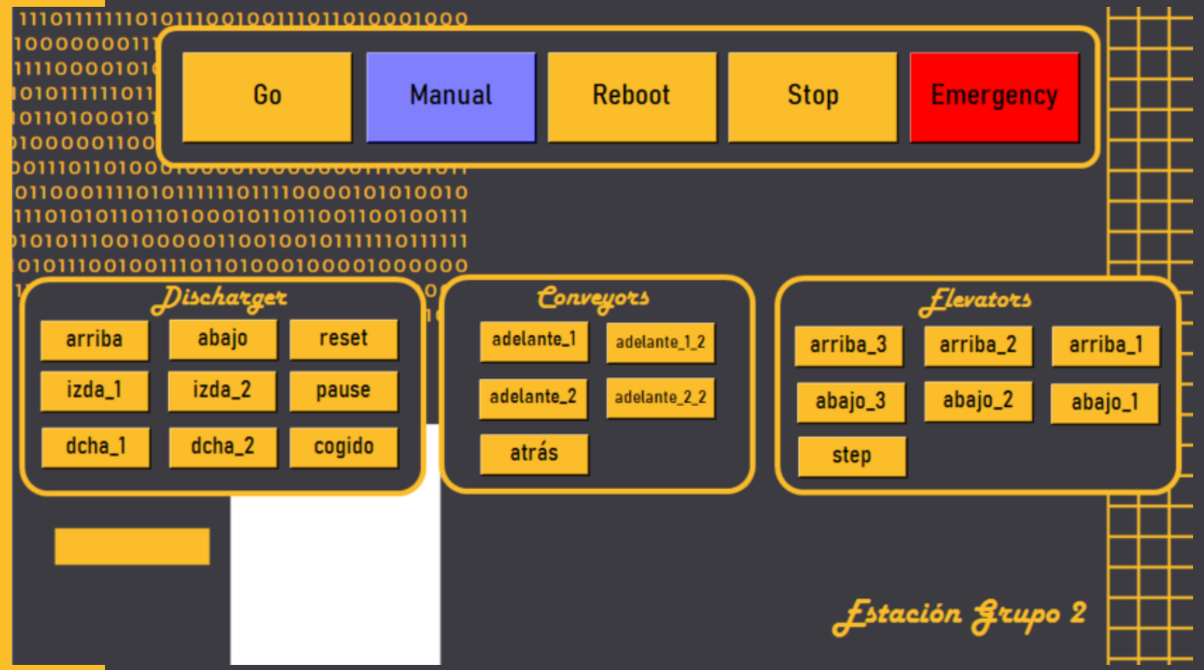
2

Alimentación

Arquitectura

```
FUNCTION_BLOCK FB_Panel
VAR_INPUT
    Mode: GEMMA;
    Restart_Time: TIME := T#3s;

END_VAR
VAR_OUTPUT
     Emergency: BOOL;
     Go:      BOOL;
     Manual:      BOOL;
     Stop:        BOOL;
     Reboot:    BOOL; (* Restablece situacion inicial *)
     Restore:    BOOL; (* Restaura condiciones iniciales *)
END_VAR
```

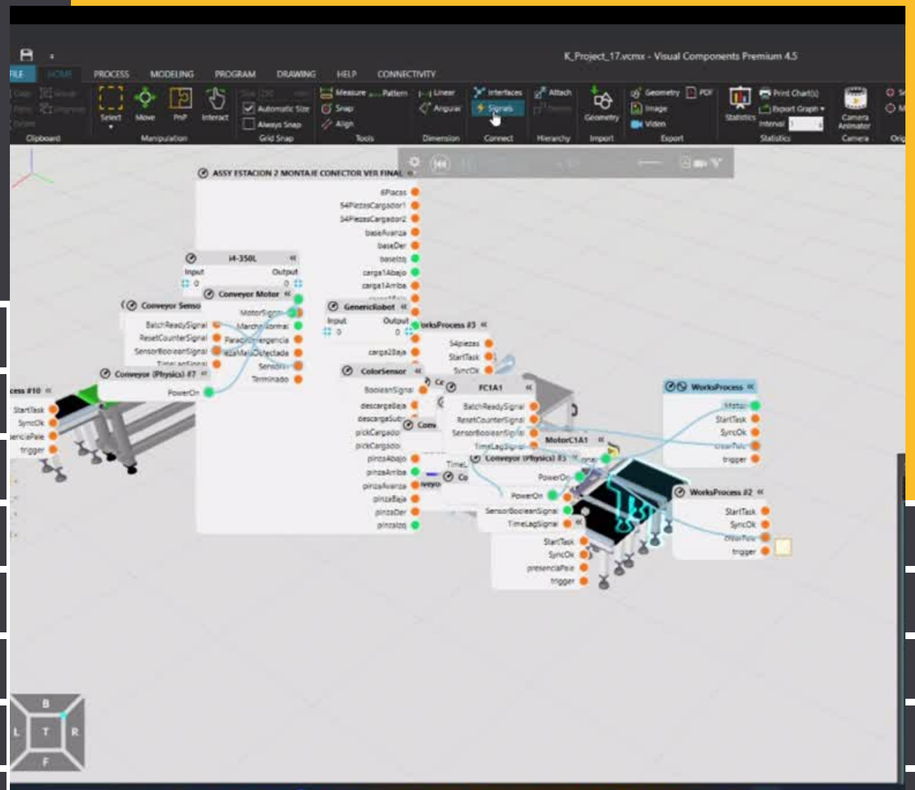
```
(* ACCIONES *)
Red_Lamp := (Mode = F3SecuenciaFinalizacion) OR (((Mode = D1ParadaEmergencia) OR (Mode = D2TratamientoFallos) OR (
Yellow_Lamp := ((Mode = A6Inicializando) OR (Mode = D1ParadaEmergencia) OR (Mode = D2TratamientoFallos)) AND CLK.Q
Green_Lamp := ((Mode = A2ParaFinCiclo) OR (Mode = F1ProduccionNormal) OR (Mode = F2SecuenciaPreparacion) OR (Mode
```



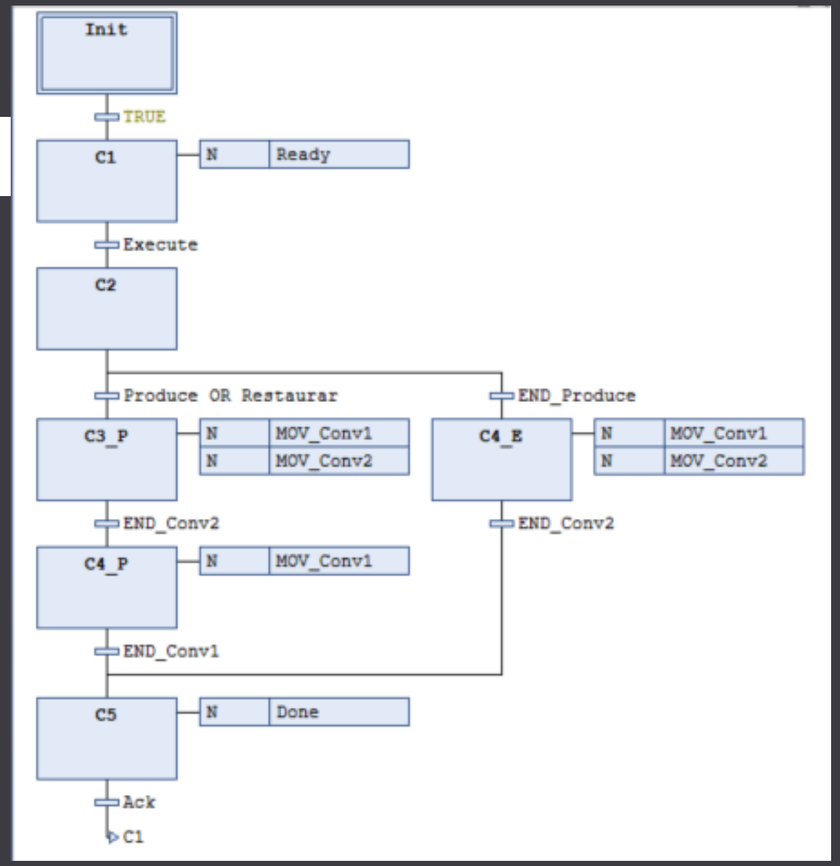
2

Alimentación

Conveyors



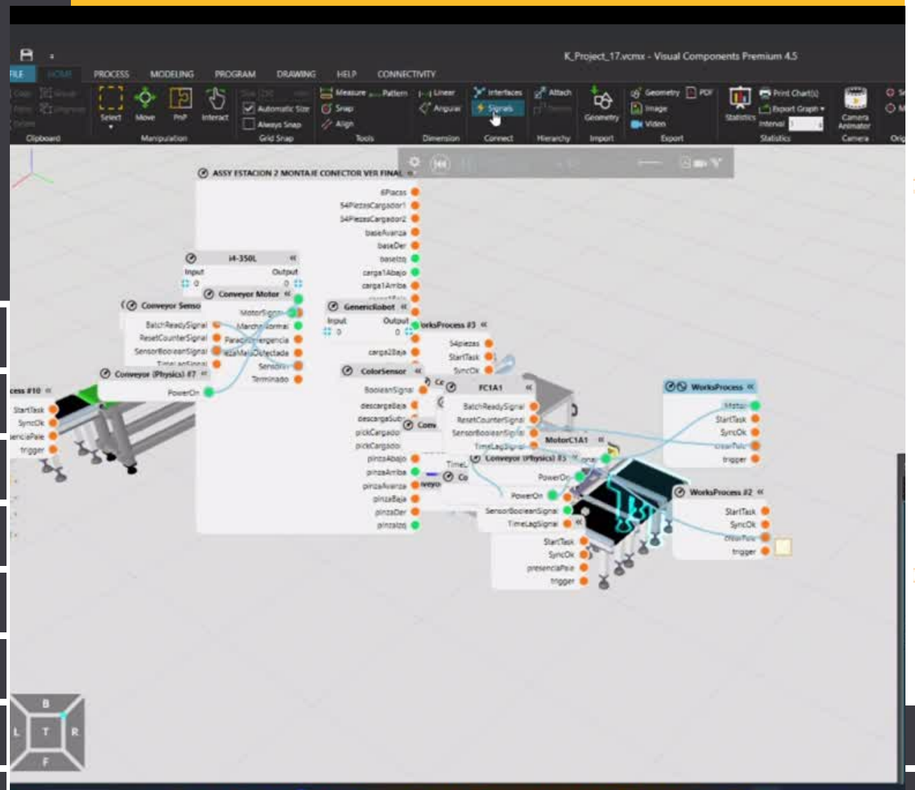

```
Conveyors_B1(Execute:=Execute,
             Ack:=Ack,
             SFCReset:=Reset,
             SFCPause:=Pause,
             IC:=IC,
             END_Conv1 := END_Conv1_B1,
             END_Conv2 := END_Conv2_B1,
             Produce := Produce_B1,
             END_Produce := END_Produce_B1,
             Restaurar := Restaurar,

);

Conveyors_B2(Execute:=Execute,
             Ack:=Ack,
             SFCReset:=Reset,
             SFCPause:=Pause,
             IC:=IC,
             END_Conv1 := END_Conv1_B2,
             END_Conv2 := END_Conv2_B2,
             Produce := Produce_B2,
             END_Produce := END_Produce_B2,
             Restaurar := Restaurar,

);

Conveyor_S(Execute:=Execute,
             Ack:=Ack,
             SFCReset:=Reset,
             SFCPause:=Pause,
```



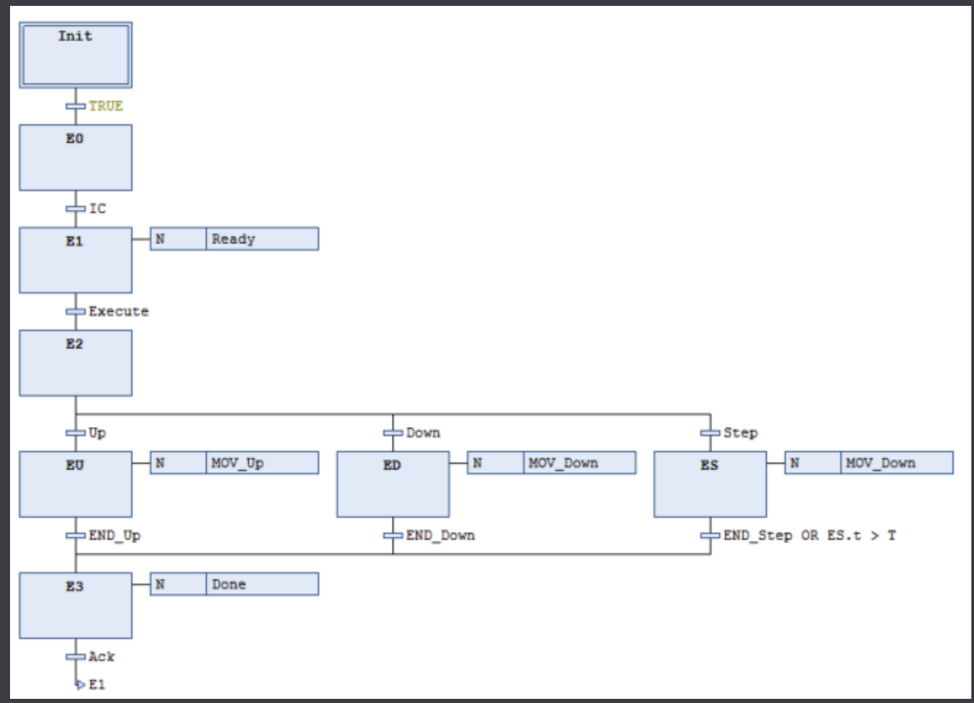
2

Alimentación

Elevators



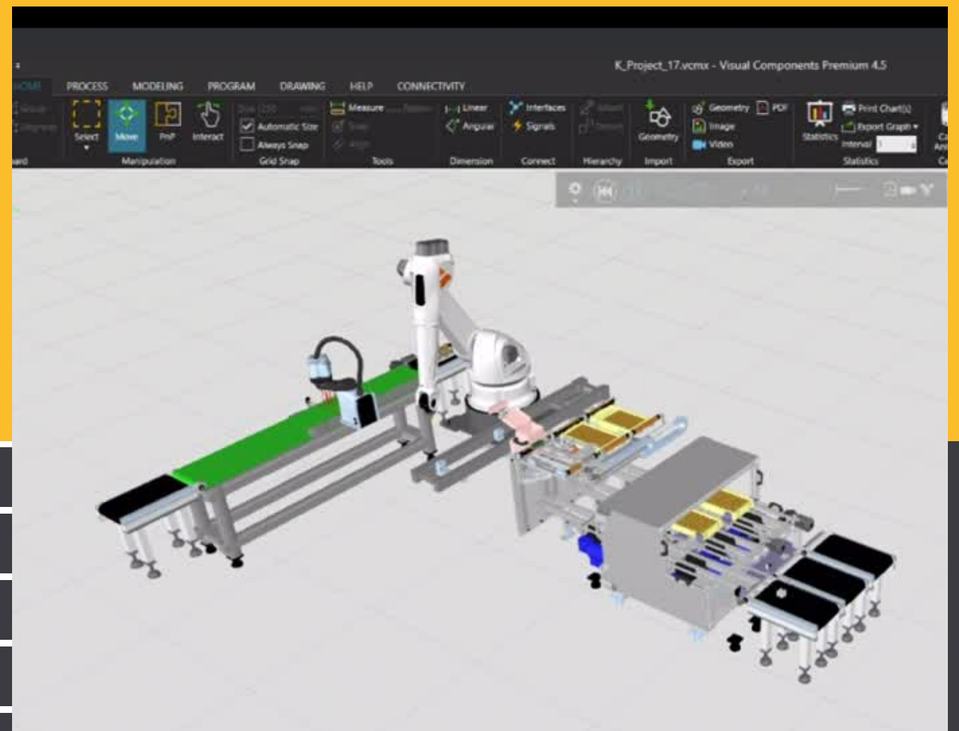

```
Elevator_B1(Execute:=Execute,
            Ack:=Ack,
            SFCReset:=Reset,
            SFCPause:=Pause,
            IC:=IC,
            END_Up:=END_Up_B1,
            END_Down:=END_Down_B1,
            Up:=Up_B1,
            Down:=Down_B1,

);

Elevator_B2(Execute:=Execute,
            Ack:=Ack,
            SFCReset:=Reset,
            SFCPause:=Pause,
            IC:=IC,
            END_Up:=END_Up_B2,
            END_Down:=END_Down_B2,
            Up:=Up_B2,
            Down:=Down_B2,

);

Elevator_S(Execute:=Execute,
            Ack:=Ack,
            SFCReset:=Reset,
            SFCPause:=Pause,
```

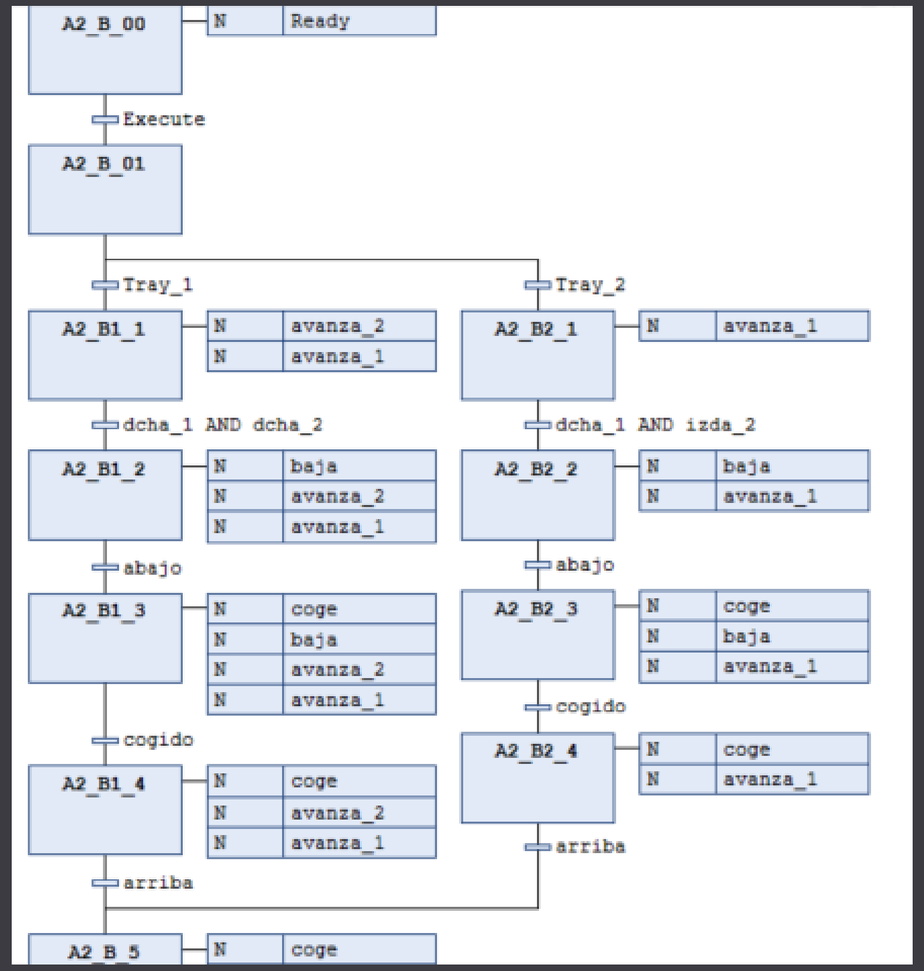


2

Alimentación

Discharger





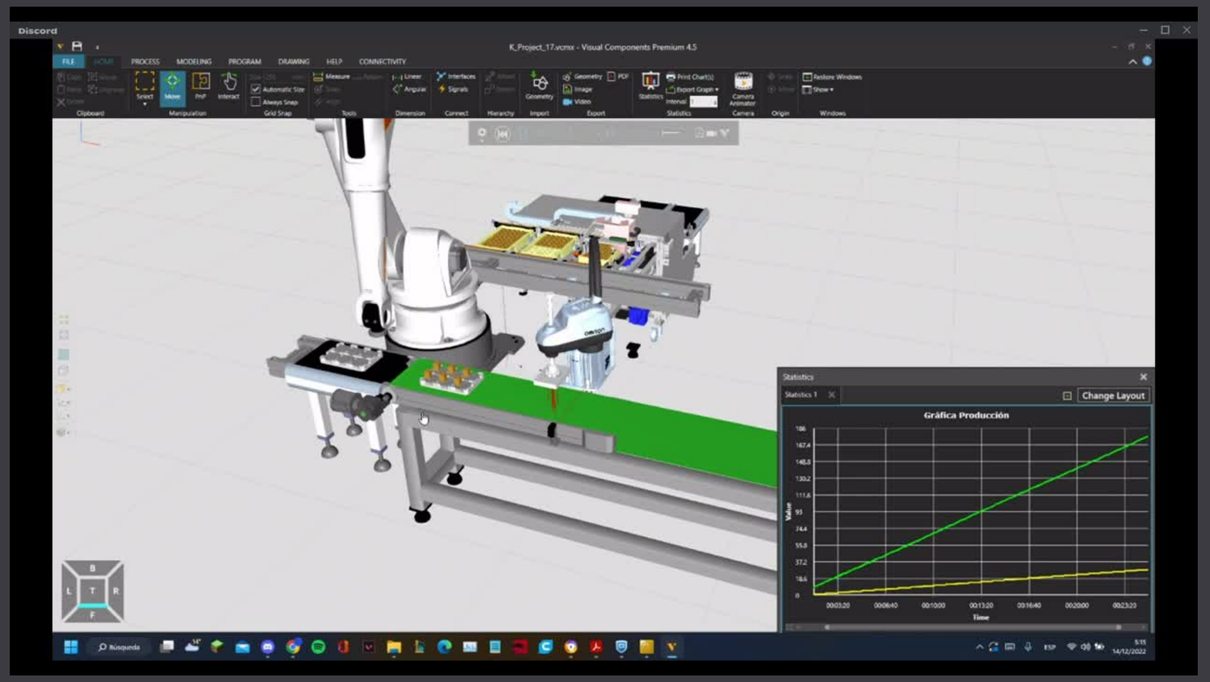
3

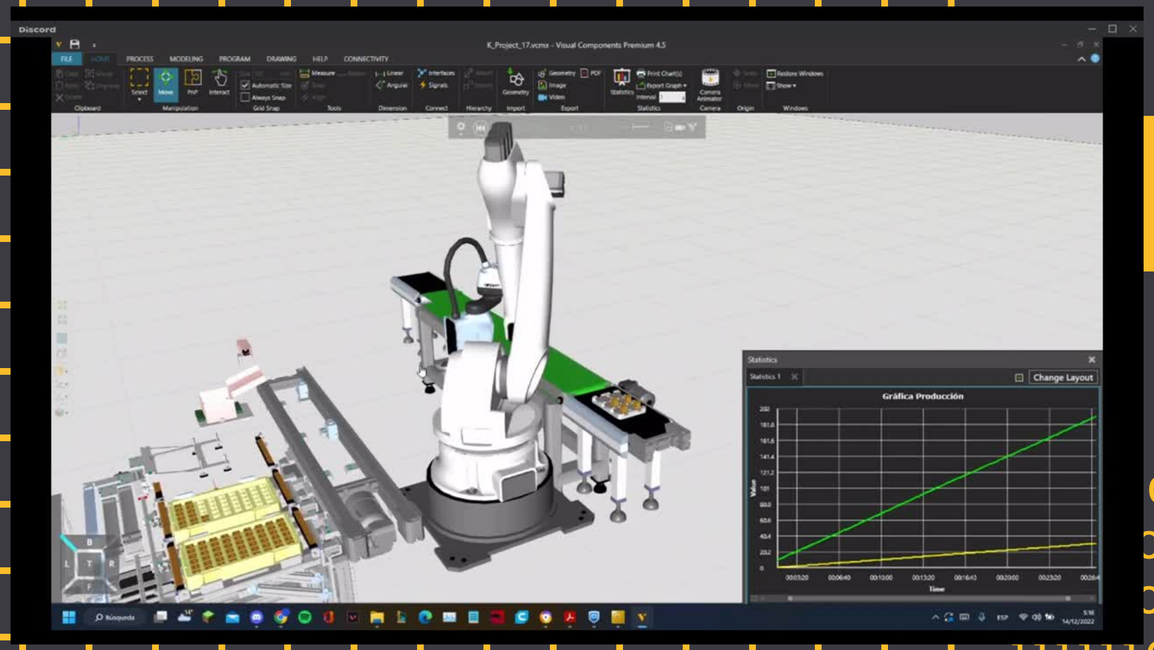
Manipuladores

PROGRAMANDO LOS BRAZOS

SCARA

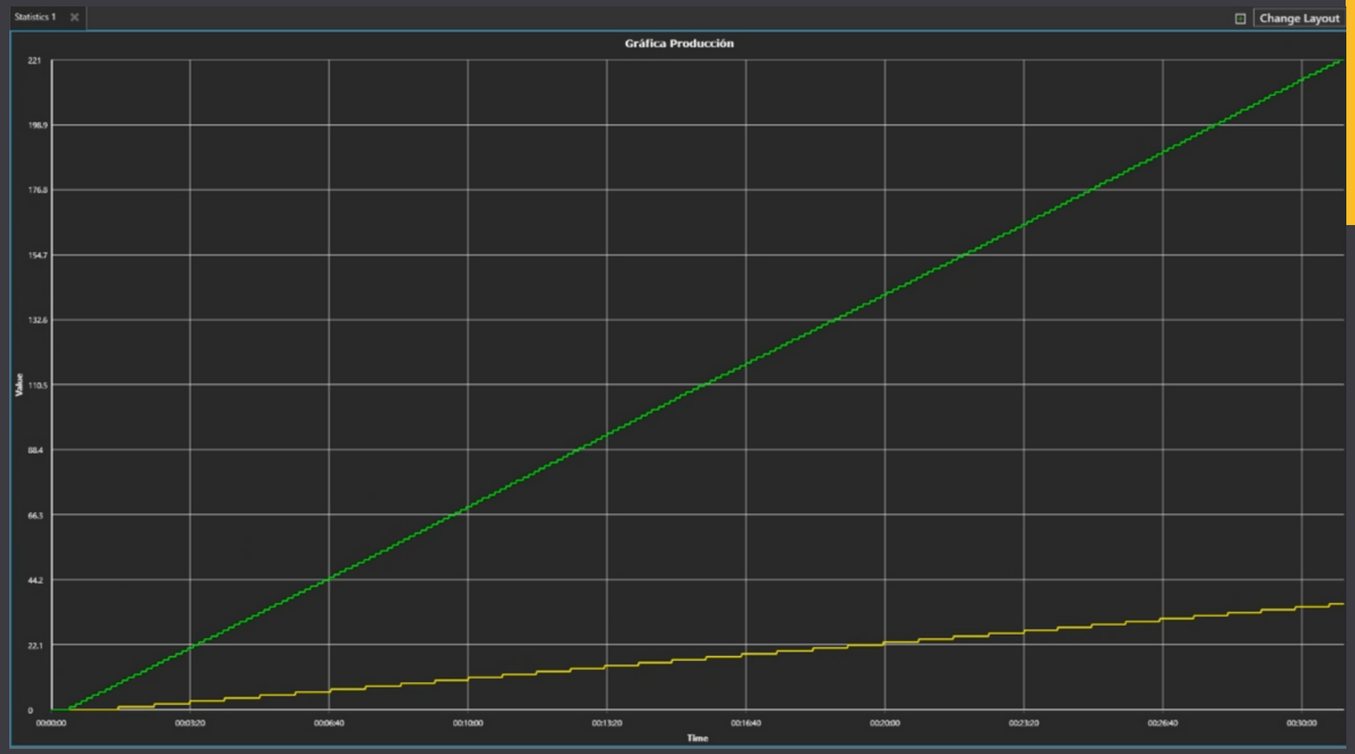
```
63  def MoveToMeasurePoint(robot,pos,aproxOffset):
64      errorPieza = 0
65      # Punto de aproximacion
66      robot.jointMoveToPosition(pos[0],pos[1],pos[2]+aproxOffset,0,0,0,"irobot")
67      robot.delay(0.5)
68      # Punto en cuestion
69      robot.linearMoveToPosition(pos[0],pos[1],pos[2],0,0,0,"irobot")
70      robot.delay(0.5)
71      # Ejecutar medicion (sacar alguna señal con medicion buena o mala)
72      if signalSensorIn.Value: signalPiezaMalaDetectada.signal(True)
73      # Vuelta a pto. aprox
74      robot.linearMoveToPosition(pos[0],pos[1],pos[2]+aproxOffset,0,0,0,"irobot")
75      robot.delay(0.5)
76      return errorPieza
```





DOF6

0011110101111110111100001010100101010110110100010110110011001000101110010000011001001011111101111110101110010011101101000100001000000111001011101100011110101111111011



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Flujo de Trabajo

ESTADÍSTICAS

0101111110111100001010100101
0110100010110110011001001111
0000001100100101111110111111
0011101101000100001000000
0110001111010111111011110000
1010101101101000101101100 1
0101110010000011001001011 1
0101110010011101101000 1000

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Project Management

ORGANIZAR ES IMPORTANTE

readme.md

GEMELOS DIGITALES

Bienvenidos! Cread vuestra propia rama para trabajar. .

Documentación

Toda la info interesante que encontréis en internet subidla a OneDrive. (@lanchitosinc sube ahí la documentación de estadística)

Onedrive

Conectar a Matlab: https://academy.visualcomponents.com/lessons/connect-a-remote-opc-ua-server/

Visualizar tareas

Tareas

Issue para las ideas

#12

Gemelos Digitales

Timeline | + New view

	Title	Assignees	Status
	1) Modelado Básico 5		
1	Modelado de bandejas y elementos #1	itszyon	Done
2	Sensor de posición de componentes #2	itszyon	In Progress
3	Programación Brazos Robóticos #4	juanmhl	Done
4	Modelado y programación Conveyors #5	Antomori and Lanc...	In Progress
5	Modelado y programación Discharger #6	AlbaCorreal	In Progress
	Cannot add items when grouped by milestone		
	2) Perfeccionamiento 3		
6	Brazos: Programación #11	juanmhl	In Progress
7	Layout: Acabar diseño #9	itszyon	Todo
8	PLC: Coordinación de Módulos del sistema #8	AlbaCorreal and An...	In Progress
	Cannot add items when grouped by milestone		
	3) Estadísticas 2		
9	Investigación Estadística #10	Lanchitosinc	In Progress
10	Ideas para mejora #12	AlbaCorreal, Anto...	In Progress
	Cannot add items when grouped by milestone		

CONCLUSIONES

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VERACIDAD

Definir un modelo fiel a la realidad

ESCALABILIDAD

Establecer un código robusto

ANÁLISIS

Extraer estadísticas del diseño

GRACIAS

ALBA CORREAL

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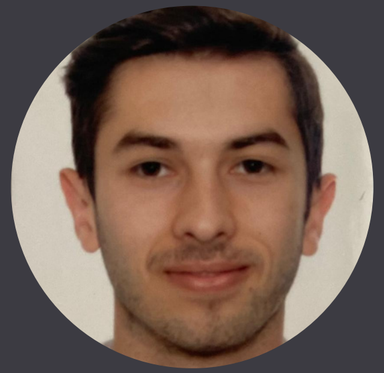

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