

CoDeSys: Variables locales y globales

The screenshot shows the CoDeSys software interface with the following components and annotations:

- POUs:** A tree view on the left shows the project structure, including 'ALARMAS (PRG)', 'FU_rLEENIVEL (FUN)', 'LUCES (PRG)', 'PLC_PRG (PRG)', 'ALARMA', 'AUTOMATICO', and 'MANUAL'. A red circle highlights this tree.
- Programa sin variables locales:** A red circle highlights the 'PROGRAM ALARMAS' section in the main editor.
- Llamada a una función:** A red circle highlights the function call `rNIVEL:=FU_rLEENIVEL(L_wSENNIV);` in the main editor.
- Variables globales:** A red circle highlights the 'Global Variables' window on the right, which lists variables like `VAR_GLOBAL`, `I_xMA: BOOL`, `I_xBV1: BOOL`, `I_xBV2: BOOL`, `I_xACK: BOOL`, `I_xMAX_TP: BOOL`, `I_xMIN_TP: BOOL`, `L_wSENNIV: WORD`, `Q_xLMAN: BOOL`, `Q_xLAUTO: BOOL`, and `Q_xLALARM: BOOL`.
- Declaración de la función con su tipo, una variable de entrada y una variable local:** A red circle highlights the function declaration `FUNCTION FU_rLEENIVEL : REAL` and its input `IN_wX: WORD` and local variable `rPENDIENTE: REAL` in the main editor.
- Asignación del valor que devuelve la función:** A red circle highlights the assignment `FU_rLEENIVEL := rPENDIENTE*(WORD_TO_REAL(IN_wX)-6000.0);` in the main editor.

CoDeSys: Configuración de las Tareas



The screenshot shows the CoDeSys software interface for task configuration. The window title is "CoDeSys - RyC_P3_SFC.pro - [Task configuration]". The menu bar includes File, Edit, Project, Insert, Extras, Online, Window, and Help. The toolbar contains various icons for file operations and simulation. The left sidebar shows a tree view of resources, with "Task configuration" selected. The main area displays a task configuration tree with "Default" and "NewTask" tasks. The "NewTask" task is selected, and its properties are shown in the right pane. The "Type" section has three radio buttons: "cyclic" (selected), "freewheeling", and "triggered by event". The "Interval (e.g. t#200ms)" field is set to "T#100ms".

1: Tareas Freewheeling

2: Tareas Cíclicas

Configurador de Tareas

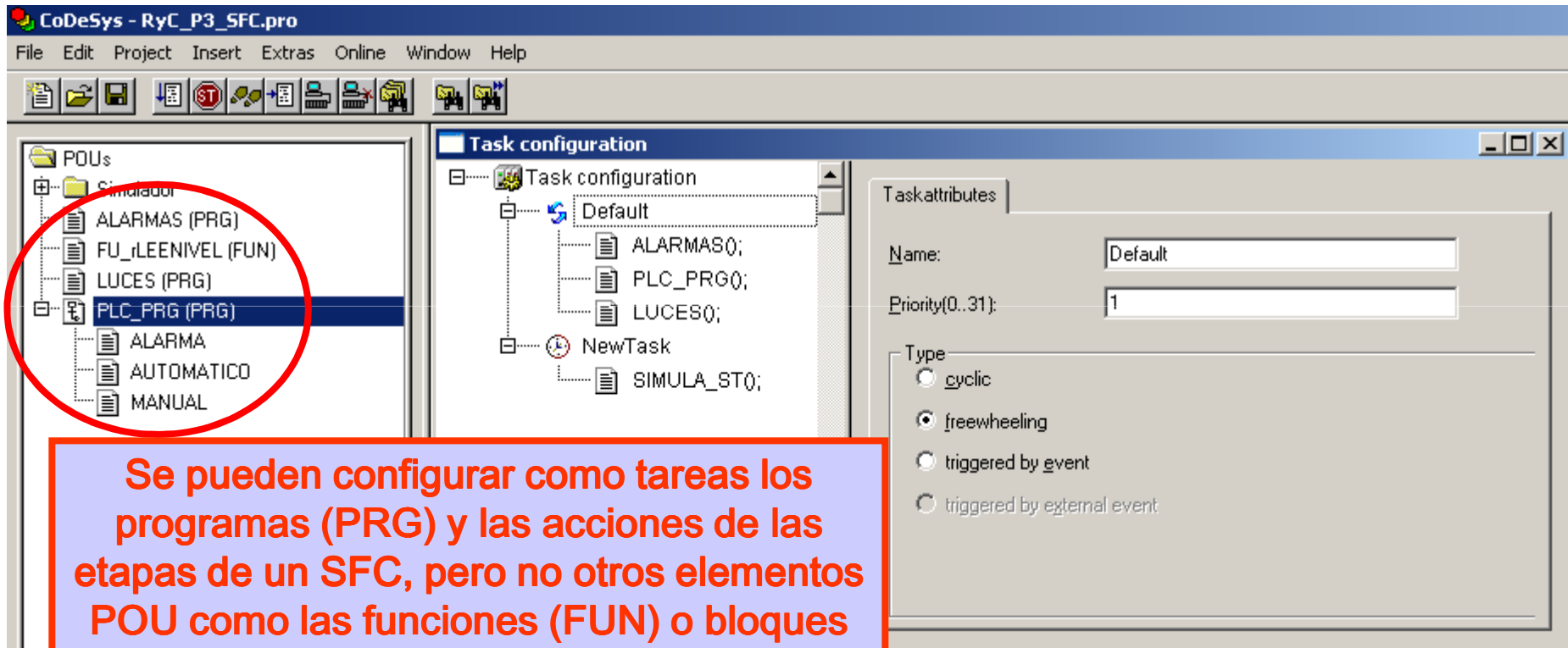
Tiempo de ciclo para las tareas cíclicas

1

2

Name: NewTask
Priority(0..31): 1
Type:
 cyclic
 freewheeling
 triggered by event
 triggered by external event
Properties:
Interval (e.g. t#200ms): T#100ms ms

CoDeSys: Tareas configurables



CoDeSys - RyC_P3_SFC.pro

File Edit Project Insert Extras Online Window Help

Task configuration

Task configuration

- Default
 - ALARMAS();
 - PLC_PRG();
 - LUCES();
- NewTask
 - SIMULA_ST();

Taskattributes

Name: Default

Priority(0..31): 1

Type

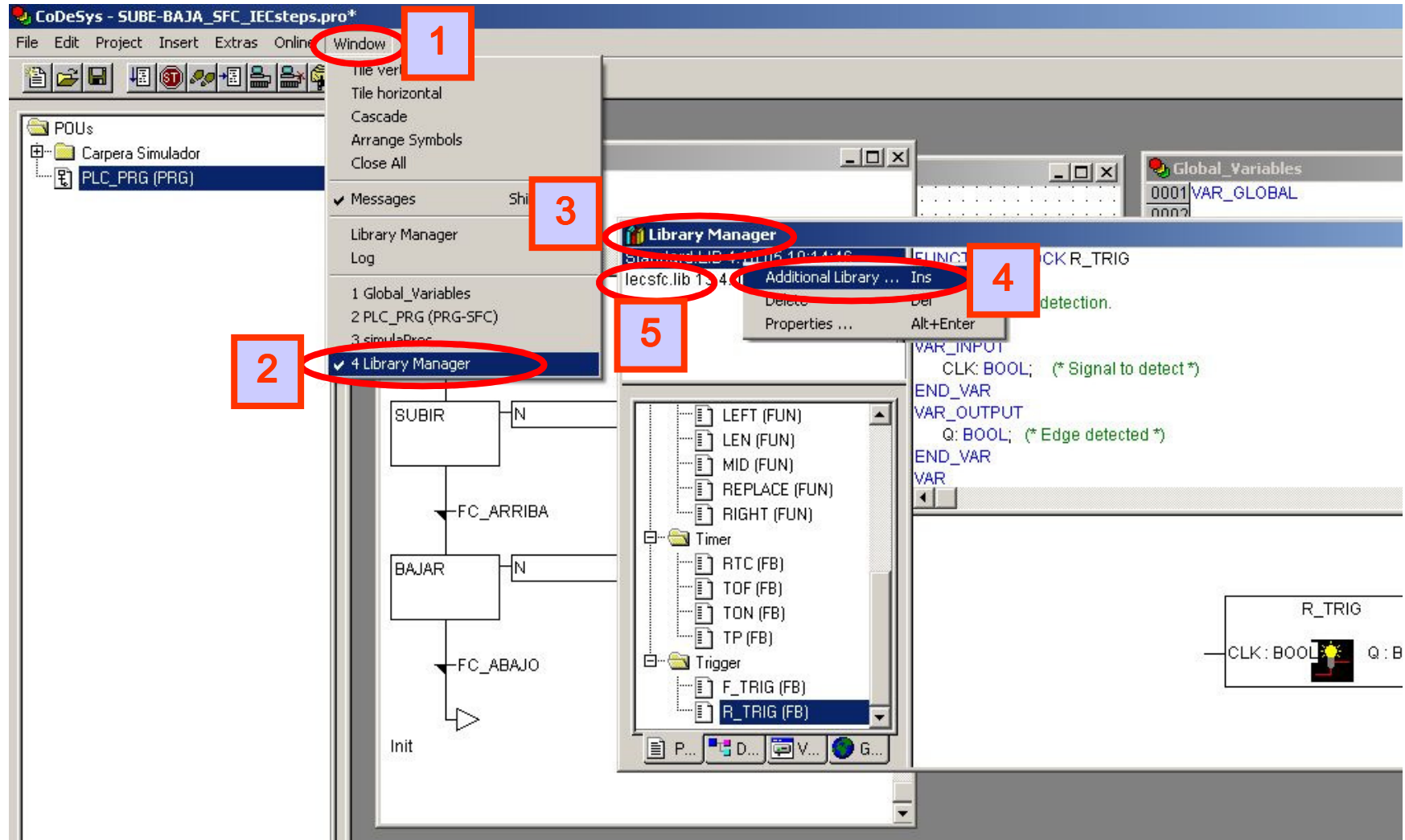
- cyclic
- freewheeling
- triggered by event
- triggered by external event

POUs

- Simulador
 - ALARMAS (PRG)
 - FU_LEENIVEL (FUN)
 - LUCES (PRG)
 - PLC_PRG (PRG)
 - ALARMA
 - AUTOMATICO
 - MANUAL

Se pueden configurar como tareas los programas (PRG) y las acciones de las etapas de un SFC, pero no otros elementos POU como las funciones (FUN) o bloques funcionales (FB)

CoDeSys: Añadir librería "IEC steps"

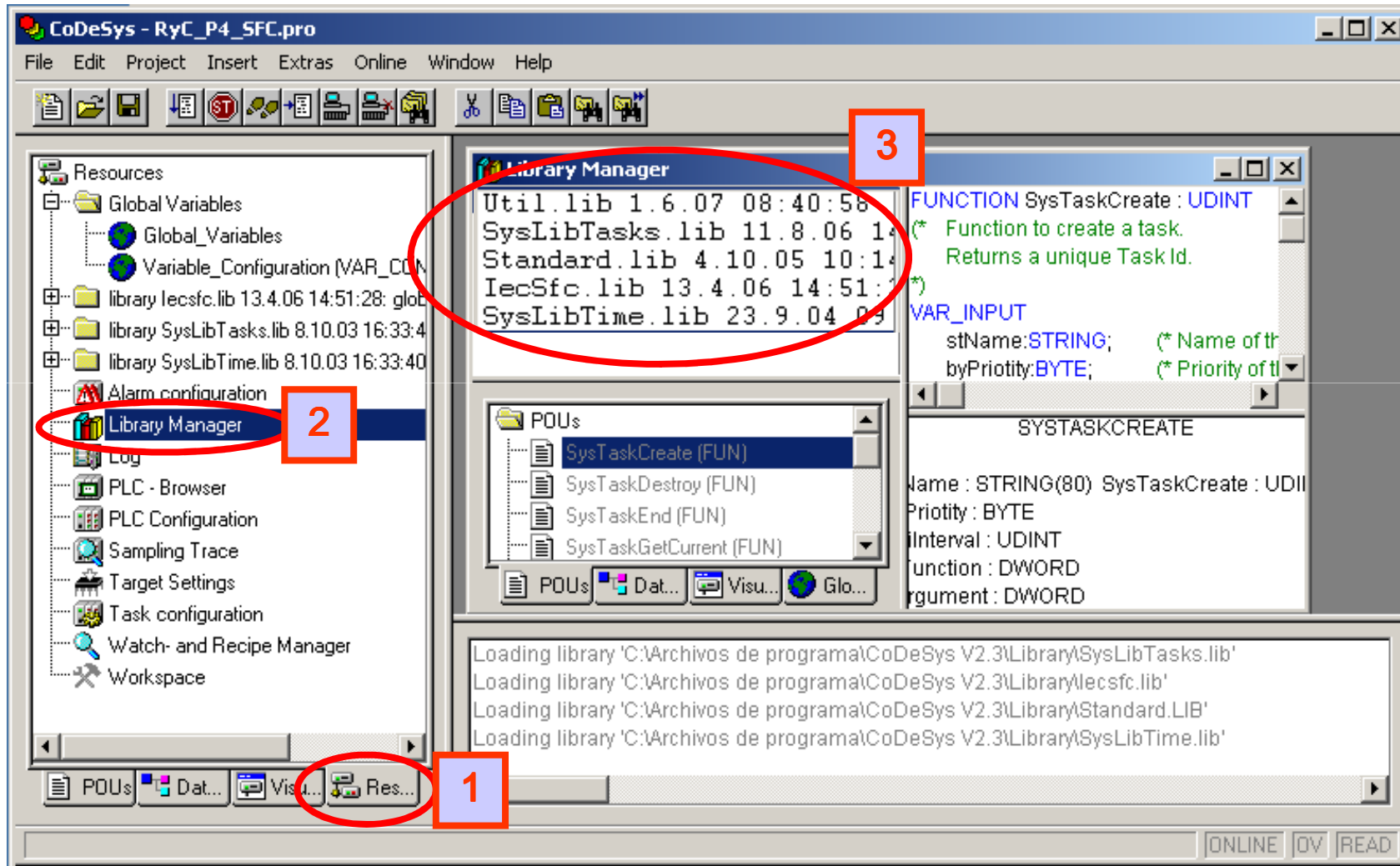


The screenshot shows the CoDeSys software interface with the following elements and annotations:

- 1**: A red box highlights the **Window** menu.
- 2**: A red box highlights the **Library Manager** option in the **Window** menu.
- 3**: A red box highlights the **Library Manager** option in the **Window** menu.
- 4**: A red box highlights the **Additional Library ...** option in the **Library Manager** dialog.
- 5**: A red box highlights the **iecsfc.lib** entry in the library list.

The background shows a ladder logic diagram with steps labeled SUBIR, FC_ARRIBA, BAJAR, and FC_ABAJO, and a variable declaration for R_TRIG.

CoDeSys: Conjunto de librerías recomendado



The screenshot shows the CoDeSys software interface for a project named 'CoDeSys - RyC_P4_SFC.pro'. The interface includes a menu bar (File, Edit, Project, Insert, Extras, Online, Window, Help), a toolbar, and a main workspace. The workspace is divided into several panes:

- Resources:** A tree view on the left showing project resources like Global Variables, Variable Configuration, and various library folders (e.g., library IecSfc.lib, library SysLibTasks.lib, library SysLibTime.lib). The 'Library Manager' icon is circled in red and labeled with a blue box containing the number '2'.
- Library Manager:** A central pane showing a list of libraries with their versions and timestamps. The list includes: Util.lib 1.6.07 08:40:58, SysLibTasks.lib 11.8.06 14:03:40, Standard.lib 4.10.05 10:14:00, IecSfc.lib 13.4.06 14:51:28, and SysLibTime.lib 23.9.04 09:00:00. This list is circled in red and labeled with a blue box containing the number '3'.
- POUs:** A pane below the Library Manager showing a list of Program Objects Units (POUs) including SysTaskCreate (FUN), SysTaskDestroy (FUN), SysTaskEnd (FUN), and SysTaskGetCurrent (FUN). This pane is also circled in red and labeled with a blue box containing the number '1'.
- Bottom Status Bar:** Shows the status 'ONLINE' and 'OV READ'. The 'Res...' button in the bottom toolbar is circled in red.

The right side of the interface displays the details of the selected POU, 'SYSTASKCREATE', showing its function signature and parameters:

```
FUNCTION SysTaskCreate : UDINT  
(* Function to create a task.  
Returns a unique Task Id.  
)  
VAR_INPUT  
  stName:STRING; (* Name of the task  
  byPriority:BYTE; (* Priority of the task  
  Interval:UDINT  
  Argument:DWORD
```

Ejemplo



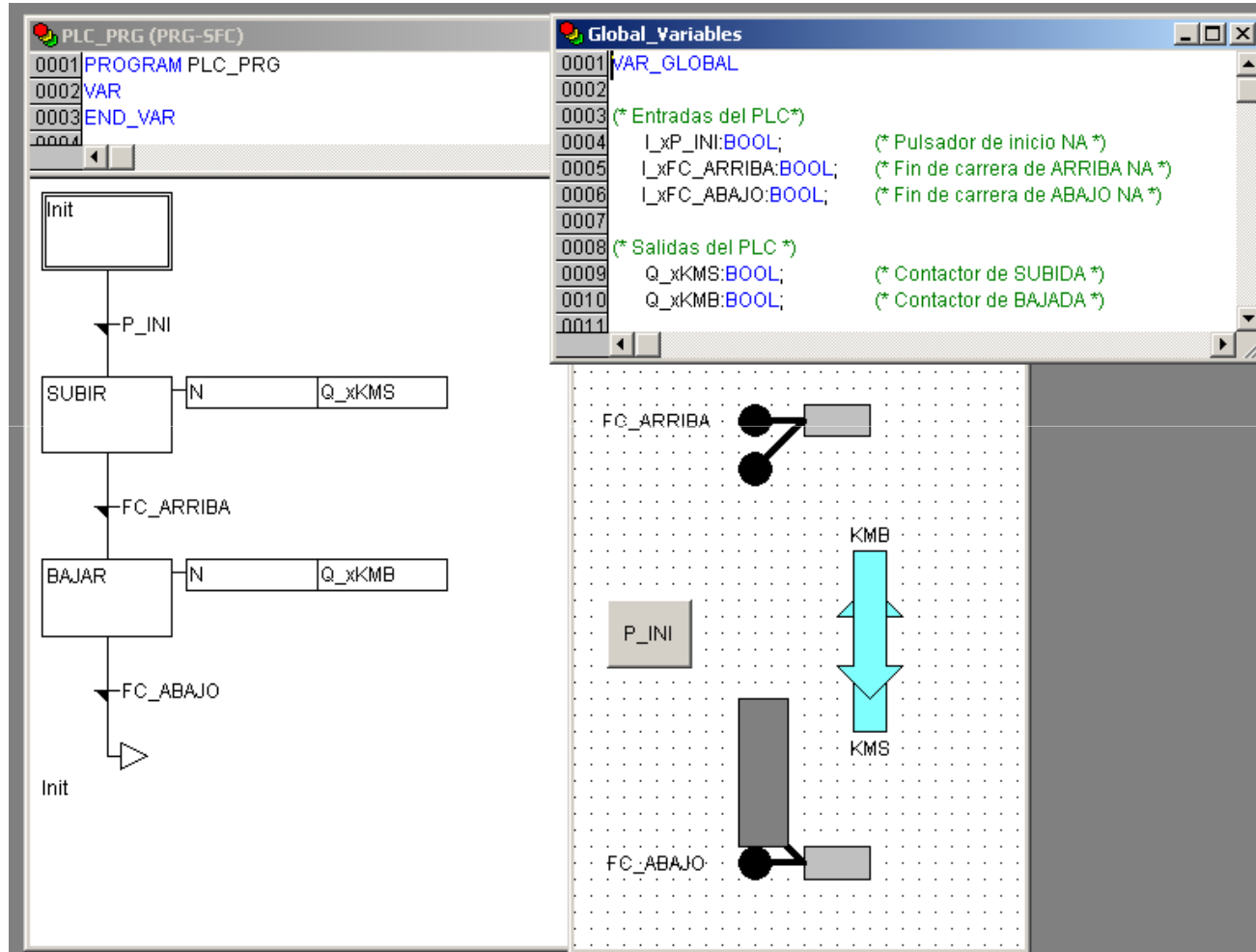
Una vez pulsado "MARCHA" el elemento sube hasta "ARRIBA", baja automáticamente y se para "ABAJO".



AMPLIACIONES:

- ¿Qué hacer si el elemento no se encuentra inicialmente abajo?
- ¿Qué hacer si durante la maniobra se vuelve a pulsar "MARCHA"?
- ¿Qué hacer si se tarda demasiado en la maniobra de subida o de bajada?
- ¿Qué hacer si los dos fines de carrera están activos simultáneamente?
- ¿Cómo indicar cualquier posible fallo, aceptarlo y rearmar la instalación?
- ¿Conviene considerar alguna temporización para que Q0.0 y Q0.1 no estén activos simultáneamente?

Ejemplo con CoDeSys: SFC con "IEC steps"



Ejemplo con CoDeSys: SFC sin IEC steps

The image displays the CoDeSys software interface for a PLC program. It features several windows:

- PLC_PRG (PRG-SFC):** Shows the main SFC program structure with steps: Init, SUBIR, BAJAR, and another Init. Transitions are labeled P_INI, FC_ARRIBA, and FC_ABAJO. Red circles highlight these transition labels.
- Global Variables:** A table listing variables:

0001	VAR_GLOBAL	
0002		
0003	(* Entradas del PLC *)	
0004	I_xP_INI:BOOL;	(* Pulsador de inicio NA *)
0005	I_xFC_ARRIBA:BOOL;	(* Fin de carrera de ARRIBA NA *)
0006	I_xFC_ABAJO:BOOL;	(* Fin de carrera de ABAJO NA *)
0007		
0008	(* Salidas del PLC *)	
	Q_xKMS:BOOL;	(* Contactor de SUBIDA *)
	Q_xKMB:BOOL;	(* Contactor de BAJADA *)
- Transition P_INI (ST) - PLC_PRG (PRG-SFC):** Contains the instruction: 0001 I_xP_INI.
- Action SUBIR (ST) - PLC_PRG (PRG-SFC):** Contains the instruction: 0001 Q_xKMS:= TRUE;.
- Action SUBIR - Exit (ST) - PLC_PRG (PRG-SFC):** Contains the instruction: 0001 Q_xKMS:= FALSE;.
- Transition FC_ARRIBA (ST) - PLC_PRG (PRG-SFC):** Contains the instruction: 0001 I_xFC_ARRIBA.
- Action BAJAR - Entry (ST) - PLC_PRG (PRG-SFC):** Contains the instruction: 0001 Q_xKMB:= TRUE;.
- Action BAJAR - Exit (ST) - PLC_PRG (PRG-SFC):** Contains the instruction: 0001 Q_xKMB:= FALSE;.
- Transition FC_ABAJO (ST) - PLC_PRG (PRG-SFC):** Contains the instructions: 0001 I_xFC_ABAJO and 0002.

Red arrows indicate the flow of logic from the SFC transitions to their corresponding variable declarations and actions.

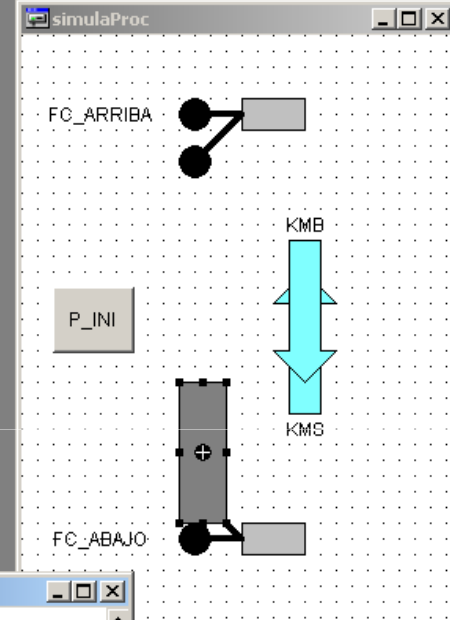
Ejemplo con CoDeSys: LD

PLC_PRG (PRG-LD)

```

0001 PROGRAM PLC_PRG
0002 VAR
0003 END_VAR
0004
0001
    I_xP_INI I_xFC_ARRIBA Q_xKMS
    Q_xKMS
0002
    I_xFC_ARRIBA I_xFC_ABAJO Q_xKMB
    Q_xKMB
        
```

simulaProc



Global_Variables

```

0001 VAR_GLOBAL
0002
0003 (* Entradas del PLC *)
0004 I_xP_INI:BOOL; (* Pulsador de inicio NA *)
0005 I_xFC_ARRIBA:BOOL; (* Fin de carrera de ARRIBA NA *)
0006 I_xFC_ABAJO:BOOL; (* Fin de carrera de ABAJO NA *)
0007
0008 (* Salidas del PLC *)
0009 Q_xKMS:BOOL; (* Contactor de SUBIDA *)
0010 Q_xKMB:BOOL; (* Contactor de BAJADA *)
0011
0012 (* Para el simulador *)
0013 altura:REAL:=20.0; (* Varía entre 0 abajo y 100 arriba *)
0014
0015 END_VAR
        
```

Ejemplo con CoDeSys: ST

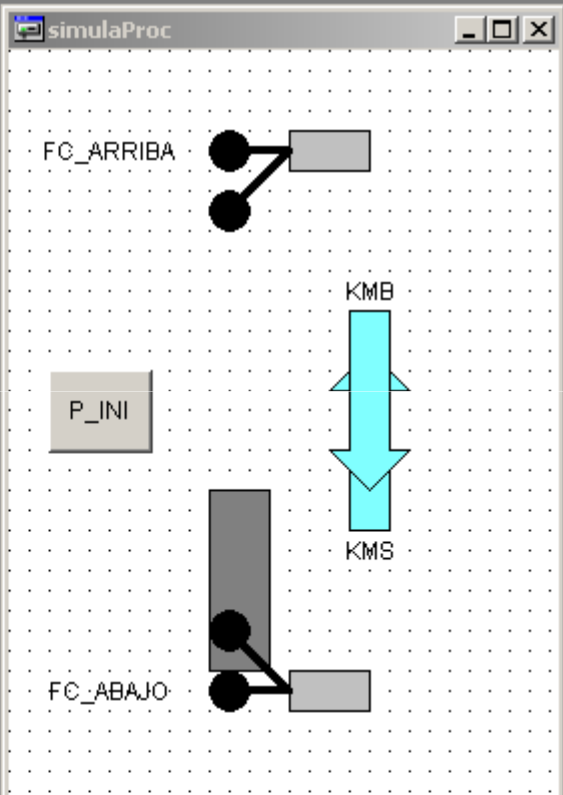
PLC_PRG (PRG-ST)

```

0001 PROGRAM PLC_PRG
0002 VAR
0003 END_VAR
0004
0005
0001 Q_xKMS:=(I_xP_INI OR Q_xKMS) AND NOT I_xFC_ARRIBA AND NOT Q_xKMB;
0002 Q_xKMB:=(I_xFC_ARRIBA OR Q_xKMB) AND NOT I_xFC_ABAJO;
0003

```

simulaProc



Global_Variables

```

0001 VAR_GLOBAL
0002
0003 (* Entradas del PLC *)
0004 I_xP_INI:BOOL; (* Pulsador de inicio NA *)
0005 I_xFC_ARRIBA:BOOL; (* Fin de carrera de ARRIBA NA *)
0006 I_xFC_ABAJO:BOOL; (* Fin de carrera de ABAJO NA *)
0007
0008 (* Salidas del PLC *)
0009 Q_xKMS:BOOL; (* Contactor de SUBIDA *)
0010 Q_xKMB:BOOL; (* Contactor de BAJADA *)
0011
0012 (* Para el simulador *)
0013 altura:REAL:=20.0; (* Varía entre 0 abajo y 100 arriba *)
0014
0015 END_VAR

```