

# SPS Function module V1.03

## for PPU-P/DRL, Siemens Step 7 classic

### Quick start guide

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**Technical changes**

We reserve the right to make alterations for the purpose of technical improvement.

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### 1 About this manual

The manual describes the SPS function module.  
The SPS function module was designed to assist in correctly commissioning and controlling the sequence of the products PPU-P and DRL.

#### 1.1 Scope of application

The following products can be operated with the SPS function module:

- **PPU-P 10**
  - **PPU-P 30**
- each for:
- Standard process
  - Front and back waiting position

- **DRL 20**
  - **DRL 25**
- each for:
- Standard process
  - Front and back waiting position

#### NOTE

The SPS function module can't be used for operation with a center stop.

#### 1.2 Applicable documents


- Assembly and operating manual PPU-P
- Assembly and operating manual DRL

### 2 System requirements

The program module was designed for being operated with the following software:

- Siemens SIMATIC Manager Step 7 classic v5.5

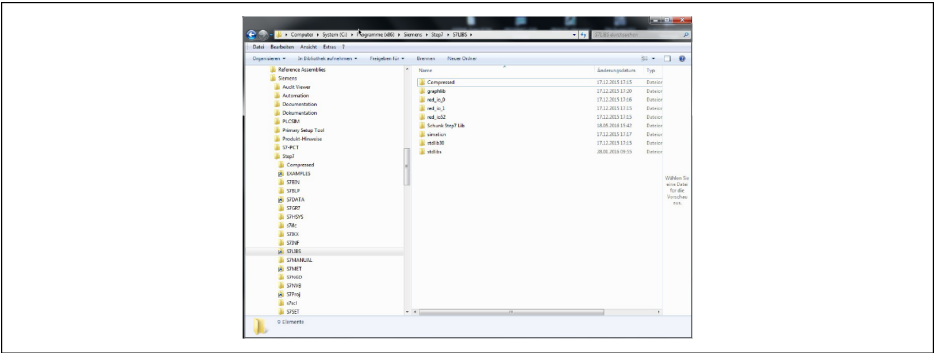
### 3 Using a SPS function module with SPS software

**NOTICE**

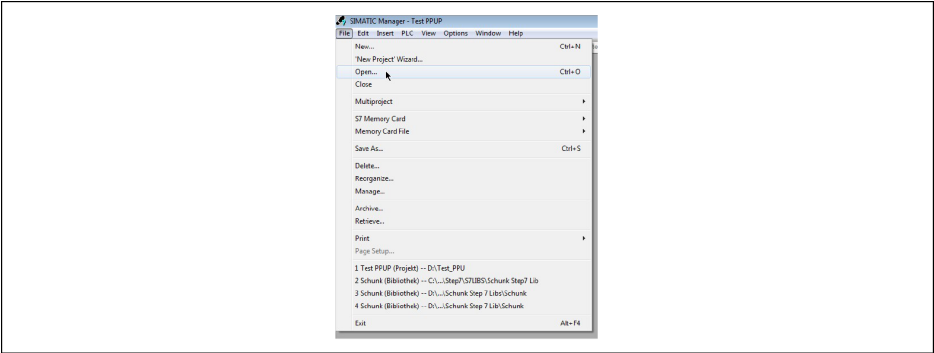
**Malfunction of PPU-P and DRL**  
Modifying the program sequence may cause malfunctions or the program failure of PPU-P and DRL.

- The SPS function module must not be modified.

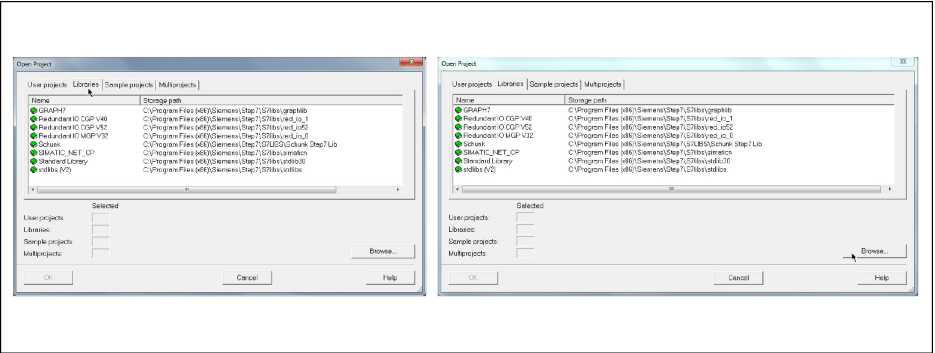
#### 3.1 Storage in the file system



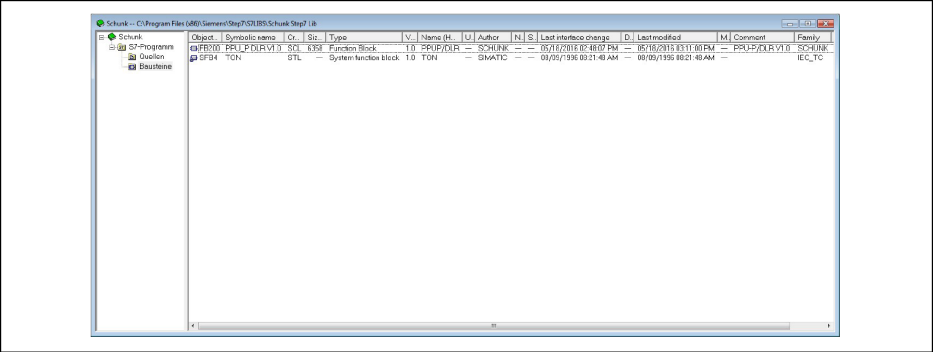
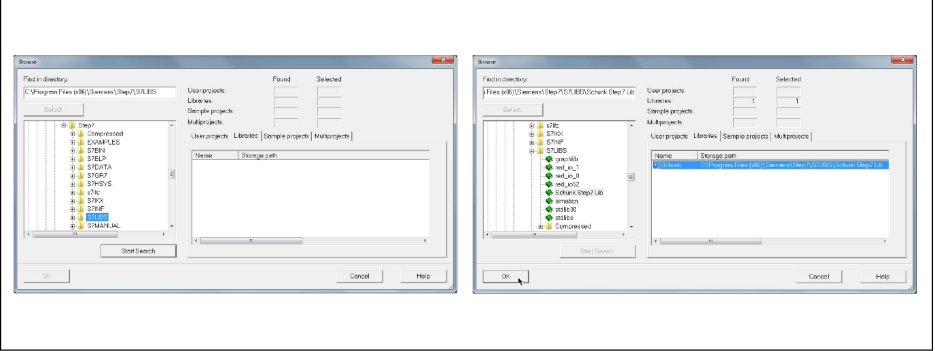
#### 3.2 Opening the SPS project



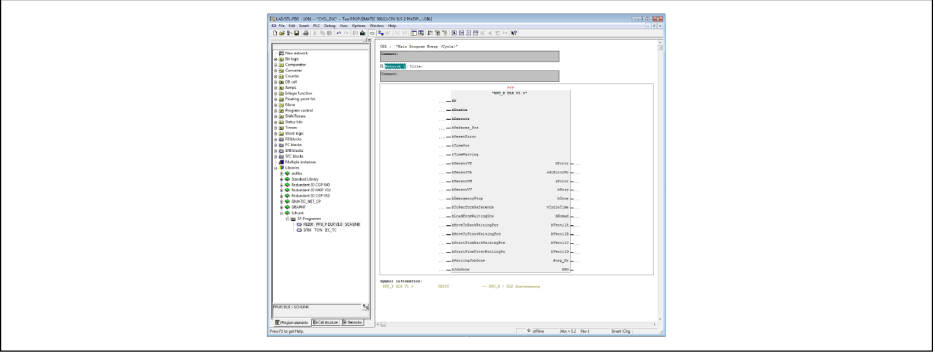
#### 3.3 Choosing library



#### 3.4 Import to the SPS project



#### 3.5 Usage in SPS project



## 4 Description of the inputs and outputs

### 4.1 Input variables

- **bEnable** If the signal is "True", the module is processed.
- **bExecute** The sequence is started for a positive signal edge (if "bHomed" is "False", the reference point is referred to before the start of the sequence), for a "True" signal the sequence is repeated, for a falling signal edge the end of the sequence is the stopping point.
- **bReferenz\_Pos** Reference position  
False = Arm is at the rear back after referencing / True = Arm is at the rear top after referencing.
- **bResetError** Resets error in case of positive signal edge, if bExecute is "False".
- **tTimeOut** Time for a sequence before the module reports an error. Default: 25 s
- **tTimeWaiting** Waiting time until the sequence advances during the individual angle positions. Default: 2 s
- **bSensorVE** Is linked to digital input of the sensor VE.
- **bSensorVA** Is linked to digital input of the Sensor VA.
- **bSensorUH** Is linked to digital input of the sensor UH.
- **bSensorUV** Is linked to digital input of the sensor UV.
- **bEmergencyStop** Sets alle valves pressureless.
- **bToPerformReference** For a positive signal edge, a reference run is performed.
- **bLoadFromWaitingPos** If signal is "True", the waiting position is used, if necessary, to move the gripper over the loading position and start the Pick-and-Place routine from that point.
- **bMoveToBackWaitingPos** If the signal is "True", movement into back waiting position.
- **bMoveToFrontWaitingPos** If the signal is "True", movement into front waiting position.
- **bStartFromBackWaitingPos** In case of a positive signal edge, the sequence is continued from back waiting position.
- **bStartFromFrontWaitingPos** In case of a positive signal edge, the sequence is continued from back waiting position.
- **bWaitingJobDone** If the signal is "True", the sequence waits for the signal "bJobDone" in the two end positions.
- **bJobDone** In case of a positive signal edge, the sequence advances if the input "bWaitingJobDone" is set to "True".

### 4.2 Output variables

- **bError** Is set to "True" if an error occurs.
- **udiErrorNo** Specifies the error number of the occurred error.
- **sError** Displays error description of the occurred error.
- **bBusy** Returns "True" if the process is running.
- **bDone** Returns "True" if the process is finished or is stopped by an error.
- **tCycleTime** Displays the cycle time.
- **bHomed** Is set to "True" if the machine is at the reference point.
- **bVentilA** Is linked to the digital output of valve A.
- **bVentilB** Is linked to the digital output of valve B.
- **bVentilC** Is linked to the digital output of valve C.
- **bVentilD** Is linked to the digital output of valve D.
- **Step\_Nr** Returns the step number, see chapter [Step number](#).

### 4.3 Step number

- **eStart** 0 Initial step
- **eStep1 to eStep 12** 1-12 Assembly and operating manual PPU-P/DRL
- **eStepBackWaitingPos** 50 In back waiting position, waiting for switching
- **eStepFrontWaitingPos** 51 In front waiting position, waiting for switching
- **eEnd** 52 Last step
- **eError** 53 Evaluation of error
- **eEmergencystop** 54 Emergency stop, resetting the outputs
- **eReference** 55 Referencing

## 5 Troubleshooting

### Error number 1: Timeout while FB executing

The SPS function module takes longer for one cycle of PPU-P than it has been declared via FB input tTimeOut. Default value are 25 seconds.

### Error number 2: Expected sensor VE, check sensor VE and pneumatic connection

The end position sensor VE is not reached.

Possible cause	Corrective action
Sensor VE is not adjusted correctly.	Check sensor position.
The sensor VE is defective.	Check sensor function and, if necessary, exchange it.
Sensor VE is interchanged.	Check sensor connection/position.
Pressure is not applied correctly to air connection vertical drive B (lowering).	Check if air connection B is connected correctly.

### Error number 3: Expected rising edge sensor UH, check pneumatic connection A/B

Sensor UH is not reached after starting VE/VA.

Possible cause	Corrective action
Air connection of vertical drive A/B are interchanged. Air connection vertical drive B (lowering) is not correctly applied with pressure.	Exchange air connections A/B.
Air connection vertical drive B (lowering) is not correctly applied with pressure.	Check pressure of air connection B.

### Error number 4: Expected rising edge sensor UH, check sensors

Sensor UH is not reached.

Possible cause	Corrective action
Sensor UH is defective.	Check sensor function.
Sensor connections are interchanged.	Check sensor connection/position.

### Error number 5: Expected falling edge sensor UV, check sensors VA and UV

The falling edge of the sensor UV is not reached.

Possible cause	Corrective action
The sensors VA and UV are interchanged.	Check sensor connections/positions.

### Error number 6: Expected falling edge sensor UV, push sensor UV higher

The falling edge of the sensor UV is not reached.

Possible cause	Corrective action
The sensor UV is adjusted too low, therefore the horizontal drive cannot push the device far enough into the guide curve in order to cause the sensor to leave.	Raise the sensor UV - adjust it "sharper".

### Error number 7: Expected falling edge sensor UV, check sensors and pneumatic connection C/D

The falling edge of the sensor UV is not reached.

Possible cause	Corrective action
Air connections C and D are interchanged.	Change air connections C and D.

### Error number 8: Expected sensor VA, check sensor VA

Sensor VA is not reached.

Possible cause	Corrective action
Sensor VA is not adjusted correctly.	Check sensor position.
Sensor VA is defective.	Check sensor function.

### Further possible errors

If the errors with the numbers 2-8 are not corrected by taking one of the above mentioned measures, check the following:

Possible cause	Corrective action
Further sensor are not adjusted correctly or functioning appropriately.	Check all sensor connections and positions.
Further air connections are not connected correctly.	Check all air connections.