

### **Festo\_Positioning\_Basic library – Jogging / Stepping**

Commissioning of a selected system with the Festo\_Positioning\_Basic library is explained step by step, so that it's successfully integrated into the user program.

FPosB

Title ..... Festo\_Positioning\_Basic library – Jogging / Stepping  
Version ..... 1.30  
Document no. .... 100102  
Original .....en  
Author .....Festo

Last saved ..... 15.06.2021

## Copyright Notice

This documentation is the intellectual property of Festo SE & Co. KG, which also has the exclusive copyright. Any modification of the content, duplication or reprinting of this documentation as well as distribution to third parties can only be made with the express consent of Festo SE & Co. KG.

Festo SE & Co KG reserves the right to make modifications to this document in whole or in part. All brand and product names are trademarks or registered trademarks of their respective owners.

## Legal Notice

Hardware, software, operating systems and drivers may only be used for the applications described and only in conjunction with components recommended by Festo SE & Co. KG.

Festo SE & Co. KG does not accept any liability for damages arising from the use of any incorrect or incomplete information contained in this documentation or any information missing therefrom.

Defects resulting from the improper handling of devices and modules are excluded from the warranty.

The data and information specified in this document should not be used for the implementation of safety functions relating to the protection of personnel and machinery.

No liability is accepted for claims for damages arising from a failure or functional defect. In other respects, the regulations with regard to liability from the terms and conditions of delivery, payment and use of software of Festo SE & Co. KG, which can be found at [www.festo.com](http://www.festo.com) and can be supplied on request, shall apply.

All data contained in this document do not represent guaranteed specifications, particularly with regard to functionality, condition or quality, in the legal sense.

The information in this document serves only as basic information for the implementation of a specific, hypothetical application and is in no way intended as a substitute for the operating instructions of the respective manufacturers and the design and testing of the respective application by the user.

The operating instructions for Festo products can be found at [www.festo.com/sp](http://www.festo.com/sp).

Users of this document (application note) must verify that all functions described here also work correctly in the application. By reading this document and adhering to the specifications contained therein, users are also solely responsible for their own application.

Table of contents

1     **Jogging/Stepping ..... 5**

1.1   Jogging ..... 5

1.2   Stepping..... 7



# 1 Jogging/Stepping

The prerequisite for this section is a configured, enabled and homed system.

The operating mode is selected for the desired function.

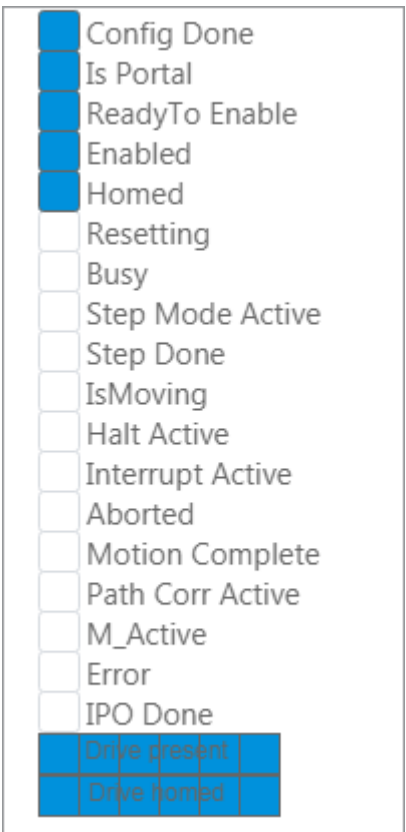
| Visualisation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Codesys                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Config Done</li> <li><input checked="" type="checkbox"/> Is Portal</li> <li><input checked="" type="checkbox"/> ReadyTo Enable</li> <li><input checked="" type="checkbox"/> Enabled</li> <li><input checked="" type="checkbox"/> Homed</li> <li><input type="checkbox"/> Resetting</li> <li><input type="checkbox"/> Busy</li> <li><input type="checkbox"/> Step Mode Active</li> <li><input type="checkbox"/> Step Done</li> <li><input type="checkbox"/> IsMoving</li> <li><input type="checkbox"/> Halt Active</li> <li><input type="checkbox"/> Interrupt Active</li> <li><input type="checkbox"/> Aborted</li> <li><input type="checkbox"/> Motion Complete</li> <li><input type="checkbox"/> Path Corr Active</li> <li><input type="checkbox"/> M_Active</li> <li><input type="checkbox"/> Error</li> <li><input type="checkbox"/> IPO Done</li> </ul> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px;">Drive present</div> <div style="border: 1px solid black; padding: 2px;">Drive present</div> <div style="border: 1px solid black; padding: 2px;">Drive present</div> <div style="border: 1px solid black; padding: 2px;">Drive present</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px;">Drive homed</div> <div style="border: 1px solid black; padding: 2px;">Drive homed</div> <div style="border: 1px solid black; padding: 2px;">Drive homed</div> <div style="border: 1px solid black; padding: 2px;">Drive homed</div> </div> | <pre> g_stOut.stSW.xError = FALSE; g_stOut.stSW.xConfigDone = TRUE; g_stOut.stSW.xIsPortal = TRUE; g_stOut.stSW.xReadyToEnable = TRUE; g_stOut.stSW.xEnabled = TRUE; g_stOut.stSW.xHomed = TRUE; g_stOut.stSW.arxMotorPresent[0] = 1; g_stOut.stSW.arxMotorPresent[1] = 1; g_stOut.stSW.arxMotorPresent[2] = 1; </pre> |

Table 1: Labelling

## 1.1 Jogging

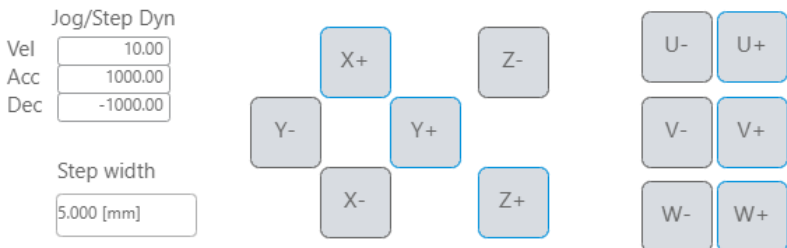
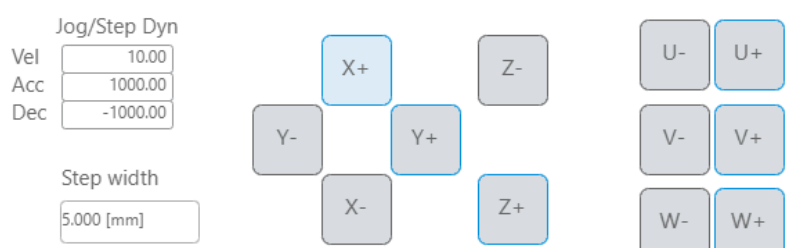
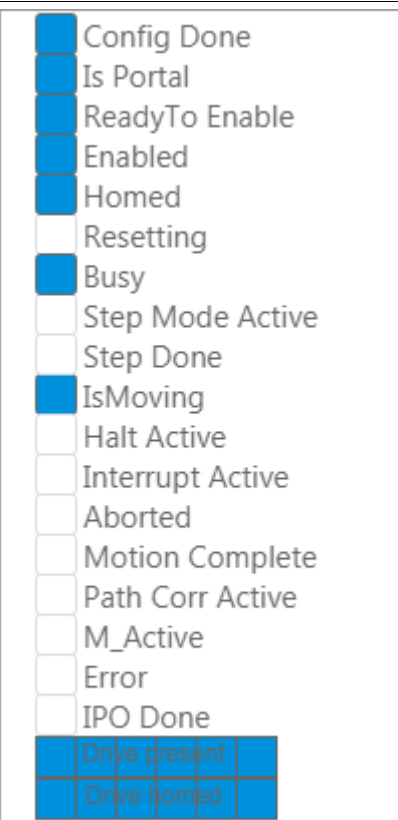
| Visualisation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Codesys                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <p>1 The dynamics values can be changed during operation, but not when travel is taking place.</p> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <p>Jog/Step Dyn</p> <p>Vel <input type="text" value="10.00"/></p> <p>Acc <input type="text" value="1000.00"/></p> <p>Dec <input type="text" value="-1000.00"/></p> </div> <div style="display: flex; flex-wrap: wrap; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">X+</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Z-</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Y-</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Y+</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">X-</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Z+</div> </div> <div style="display: flex; flex-wrap: wrap; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">U-</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">U+</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">V-</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">V+</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">W-</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">W+</div> </div> </div> | <pre> g_stIn.stDynPtp.lVel := 10; g_stIn.stDynPtp.lAcc := 100; g_stIn.stDynPtp.lDec := -100; g_stIn.stDynPtp.lJerk := 0; </pre> |

|   |                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | <p>Each axis can be set into motion independently. Simultaneous travel is not possible.<br/>In this example, the X-axis is advanced in the positive direction.</p>                                                                 | <div><div><div>Jog/Step Dyn</div><div><div>Vel</div><div>10.00</div></div><div><div>Acc</div><div>1000.00</div></div><div><div>Dec</div><div>-1000.00</div></div></div><div><div><div>X+</div><div>Y-</div><div>X-</div></div><div><div>Z-</div><div>Y+</div><div>Z+</div></div></div><div><div><div>U-</div><div>U+</div></div><div><div>V-</div><div>V+</div></div><div><div>W-</div><div>W+</div></div></div></div> <div><pre>g_stIn.eSelectAxis := eX;<br/>g_stIn.stCW.xMovePositive := TRUE;<br/>g_stIn.stCW.xMoveNegative:= FALSE;<br/><br/>g_stOut.eSelectedAxis = eX;</pre></div>                                                                                                                                                                                                                                                                                                                                                                                                               |
| 3 | <p>As long as the drive is in motion, the “is Moving” and “Busy” statuses are reported back.</p>                                                                                                                                   | <div><div><div><div><div><div></div><div>Config Done</div></div><div><div></div><div>Is Portal</div></div><div><div></div><div>ReadyTo Enable</div></div><div><div></div><div>Enabled</div></div><div><div></div><div>Homed</div></div><div><div></div><div>Resetting</div></div><div><div></div><div>Busy</div></div><div><div></div><div>Step Mode Active</div></div><div><div></div><div>Step Done</div></div><div><div></div><div>IsMoving</div></div><div><div></div><div>Halt Active</div></div><div><div></div><div>Interrupt Active</div></div><div><div></div><div>Aborted</div></div><div><div></div><div>Motion Complete</div></div><div><div></div><div>Path Corr Active</div></div><div><div></div><div>M_Active</div></div><div><div></div><div>Error</div></div><div><div></div><div>IPO Done</div></div></div><div><div><div>Drive present</div><div>Drive homed</div></div></div></div></div><div><pre>g_stOut.stSW.xIsMoving = TRUE;<br/>g_stOut.stSW.xBusy = TRUE;</pre></div></div> |
| 4 | <p>In order to stop jogging again, the corresponding input is reset.<br/>The “is Moving” status is then inactive.<br/>In order to set another axis into motion, the corresponding variable is changed, for example the Y-axis.</p> | <div><div><div>Jog/Step Dyn</div><div><div>Vel</div><div>10.00</div></div><div><div>Acc</div><div>1000.00</div></div><div><div>Dec</div><div>-1000.00</div></div></div><div><div><div>X+</div><div>Y-</div><div>X-</div></div><div><div>Z-</div><div>Y+</div><div>Z+</div></div></div><div><div><div>U-</div><div>U+</div></div><div><div>V-</div><div>V+</div></div><div><div>W-</div><div>W+</div></div></div></div> <div><pre>g_stIn.stCW.xMovePositive := FALSE;<br/><br/>g_stOut.stSW.xIsMoving = FALSE;<br/>g_stOut.stSW.xBusy = FALSE;<br/><br/>g_stIn.eSelectAxis := eY;</pre></div>                                                                                                                                                                                                                                                                                                                                                                                                            |

Table 2: Labelling

## 1.2 Stepping

Basically, the “Stepping” function is very similar to the “Jogging” function. For this reason, only the unique features will be pointed out in this section.

| Visualisation                                                                                                                                                                                                                                                                                                   | Codesys                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <p>1 The InchStep field specifies the distance in millimetres to be travelled by the axis, in this case 5 mm.</p>                                                                                                             | <pre>g_stIn.lInchStep := 5;</pre>                                                                           |
| <p>2 The travel task is executed after a rising edge is applied to the corresponding input, in this case Y-axis in positive direction.</p>                                                                                   | <pre>g_stIn.eSelectAxis := eY; g_stIn.stCW.xMovePositive := TRUE; g_stIn.stCW.xMoveNegative := FALSE;</pre> |
| <p>3 The “isMoving” and “Busy” outputs are active as long as motion is in progress. Whereas “isMoving” indicates active positioning motion, the “Busy” status indicates that an internal module is in the active state.</p>  | <pre>g_stOut.stSW.xIsMoving = TRUE; g_stOut.stSW.xBusy = TRUE;</pre>                                        |

| Visualisation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Codesys                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>4</div> <div>As soon as the axis has reached the specified position and as long as no errors have occurred, “Motion Complete” appears at the status display.<br/>The “isMoving” and “Busy” outputs are inactive.<br/>The travel task has been executed successfully. The input for the travel command can be reset.</div> <div><div><div><div><div></div><div>Config Done</div></div><div><div></div><div>Is Portal</div></div><div><div></div><div>ReadyTo Enable</div></div><div><div></div><div>Enabled</div></div><div><div></div><div>Homed</div></div><div><div></div><div>Resetting</div></div><div><div></div><div>Busy</div></div><div><div></div><div>Step Mode Active</div></div><div><div></div><div>Step Done</div></div><div><div></div><div>IsMoving</div></div><div><div></div><div>Halt Active</div></div><div><div></div><div>Interrupt Active</div></div><div><div></div><div>Aborted</div></div><div><div></div><div>Motion Complete</div></div><div><div></div><div>Path Corr Active</div></div><div><div></div><div>M_Active</div></div><div><div></div><div>Error</div></div><div><div></div><div>IPO Done</div></div><div><div><div></div><div>Drive present</div></div><div><div></div><div>Drive homed</div></div></div></div></div></div> | <div><div><div><div><div></div><div>g_stOut.xError = FALSE;</div></div><div><div></div><div>g_stOut.stSW.xMotionComplete = TRUE;</div></div><div><div></div><div>g_stOut.stSW.xIsMoving = FALSE;</div></div><div><div></div><div>g_stOut.stSW.xBusy = FALSE;</div></div><div><div></div><div>g_stIn.stCW.xMovePositive := FALSE;</div></div></div></div></div> |