STEP 7 Blocks for Key Panels KP8, KP8F and KP32F

configuration manual

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Contents

1   Preface

1.1   Contents of this Documentation

Parameterizable STEP 7 blocks have been created for evaluating the LEDs of the buttons of the key panels KP8, KP8F and KP32F. The present documentation describes the function and applications of these blocks.

1.2   Validity of this Documentation

The program blocks were created with WinCC (TIA Portal) V15. The blocks are collated in the STEP 7 library "Key_Panels_Library".

1.3   Context of the Documentation

The documentation refers to the following operator panels:
• SIMATIC HMI KP8/KP8F
• SIMATIC HMI KP32F

2 Scope of Application

2.1 Hardware and Software Components

2.1.1 Validity

This application is valid for

- STEP 7 Professional V15 and higher
- SIMATIC Controllers S7-1200, S7-1500, S7-400, S7-300
- Key Panels KP8 PN, KP8F PN and KP32F PN

2.1.2 Components Used

The application has been created with the components below.

Hardware components

Table 2-1

Component	Qty.	Article number	Alternatives
SIMATIC S7-1516F-3 PN/DP	1	6ES7 516-3FN01-0AB0	other SIMATIC S7-1200 (F) or S7-1500(F)[1] CPU
SIMATIC S7-317F-2 PN/DP	1	6ES7 317-2FK14-0AB0	other SIMATIC S7-300 (F) or S7-400(F) CPU
SIMATIC KP8F PN	1	6AV3688-3AF37-0AX0	other Key Panel[1]

Software components

Table 2-2

Component	Qty.	Article number	Note
STEP 7 Professional V15	1	6ES7822-1AA05-0YA5	
STEP 7 Safety Advanced V15	1	6ES7833-1FA15-0YA5	Only with P8F and KP32F
SIMATIC WinCC Comfort V15	1	6AV2101-0AA05-0AA5	Optional

2.1.3 Sample Files and Projects

Below is a list of all the files and projects used in this example.

Table 2-3

Component	Note
63482149_KeyPanelLibrary_TIA Portal_CODE.zip	The packed file includes a sample project and the library "KeyPanel_Library"
63482149_KeyPanelLibrary_TIA Portal_DOC_en.pdf	This document.

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[1] F functionality of the CPU is not necessary when using key panels with F function (KP8F PN and KP32F PN) and vice versa.

3 Description of the Function Blocks

3.1 FC301

Validity

This chapter describes the block "LED_Control_S7_1200/1500" (FC301).

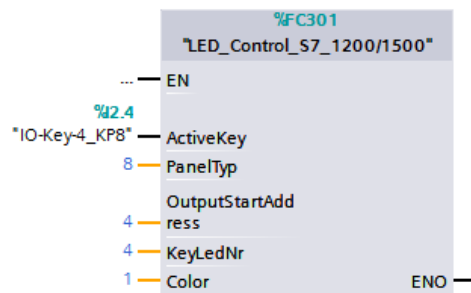The block has to be called once for each key for which the LEDs are also to be addressed.

The block number and name of the FC301 can be changed as required.

Note	The block FC301 replaces the FC300 used in the previous version. Both blocks are identical in their function.

Symbol

Figure 3-1

3.1.1 Parameters

Table 3-1

Name	Data type	Description	Value range
ActiveKey	Boolean	Designation of the button used to address the assigned LED.	0...1 (See device configuration, KPx > General > KPx Inputs/Outputs > I/O Addresses > Input Address)
PanelType	Int	Number of keys on the Key Panel concerned.	8 (KP8/KP8F) 32 (KP2F)
OutputStart Address	Int	Start address of the "Output address".	0...n (See device configuration, KPx > General > KPx Inputs/Outputs > I/O Addresses > Output Address)
KeyLedNo.	Int	Designation of the LED (starting with 0 for the 1st button)	0...7 (KP8 and KP8F) 0...31 (KP32F)

Name	Data type	Description	Value range
Color	Int	Desired color	0...5 0 – off 1 – red 2 – yellow 3 – green 4 – blue 5 – white

3.1.2 Description

Each key on the key panel has an LED that can light in 5 different colors. Depending on the parameters set the LEDs can light red, green, blue, yellow or white when the key is pressed.

- The block FC301 has to be called once for **each** key for which the LEDs are also to be addressed.

- With the "**ActiveKey"** parameter you set the input address of the key (see section 3.1.3).

- With the **"PanelType"** parameter you set the number of keys on the key panel used.

- With the **"OutputStartAddress"** parameter you specify the start address assigned for the output address in the hardware configuration of the key panel.

- With the **KeyLedNo.** parameter you specify the LED number starting with 0 for the first button (see section 3.1.3).

- With the **Color** parameter you specify the color with which the addressed LED is to light.

<table>
<tr>
<td>⚠
WARNING</td>
<td>**Personal Injury and damage to property through incorrect addressing**

The FC block writes the calculated color coding back to the base address of the key panel. If the address does not match the start address of the key panel or is even outside the defined address range, the data is written uncontrolled.

Under circumstances this might lead to unpredictable reactions on the machine or plant. This might result in personal injury, damage to the plant, destruction of the device and operating errors.

Check when configuring and during the entire operation the base address **Address** on the FC block.
Compare the address with the address in the HW Config.</td>
</tr>
</table>

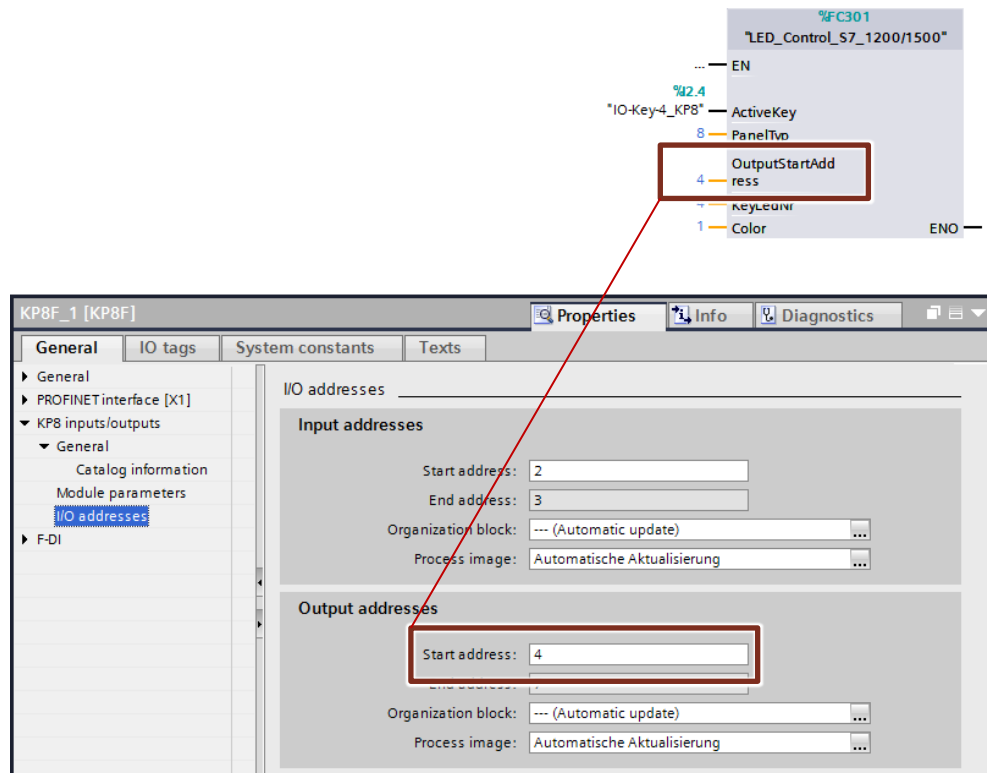### 3.1.3 Addressing

Address assignment of the key panel keys

Figure 3-2

KP32F PN

KP8 PN / KP8F PN
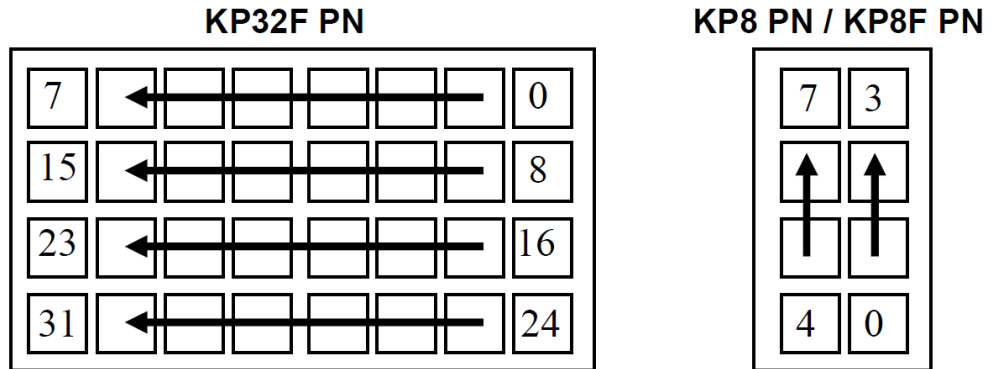
Address assignment of the key panel outputs

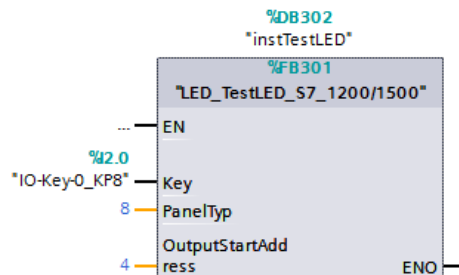Specification of the start address for the output address taking the example of the KP8F:

Figure 3-3

3.2 FB301

Validity

This chapter describes the block "LED_TestLED_S7_1200/1500" (FB301).

Via the block you run an LED test on the KPx.

Figure 3-4

3.2.1 Parameters

Table 3-2

Name	Data type	Description	Value range
Key	Boolean	Control input (address of any key of the KPx or of a different input signal).	0...1
PanelType	Int	Number of keys on the Key Panel concerned.	8 (KP8/KP8F) 32 (KP2F)
OutputStart Address	Int	Start address of the "Output address".	0...n (See device configuration, KPx > General > KPx Inputs/Outputs > I/O Addresses > Output Address)

3.2.2 Description

- The block FB301 has be to called once for **each** key panel whose LEDs are to be tested. The FB is always called at the cycle end of the OB1, because otherwise the output signals of other blocks are overwritten.

- With the **"Key"** parameter you set the event with which the LED test is started. The LEDs of all the keys are addressed one by one in all the colors.

- With the **"PanelType"** parameter you set the number of keys on the key panel used.

- With the **"OutputStartAddress"** parameter you specify the start address assigned for the output address in the hardware configuration of the key panel.

| ⚠ **WARNING**	**Personal Injury and damage to property through incorrect addressing**
	The FB block writes the calculated color coding back to the base address of the key panel. If the address does not match the start address of the key panel or is even outside the defined address range, the data is written uncontrolled.
	Under circumstances this might lead to unpredictable reactions on the machine or plant. This might result in personal injury, damage to the plant, destruction of the device and operating errors.
	Check when configuring and during the entire operation the base address **Address** on the FB block. Compare the address with the address in the HW Config.

3.2.3 Addressing

Address assignment of the key panel keys
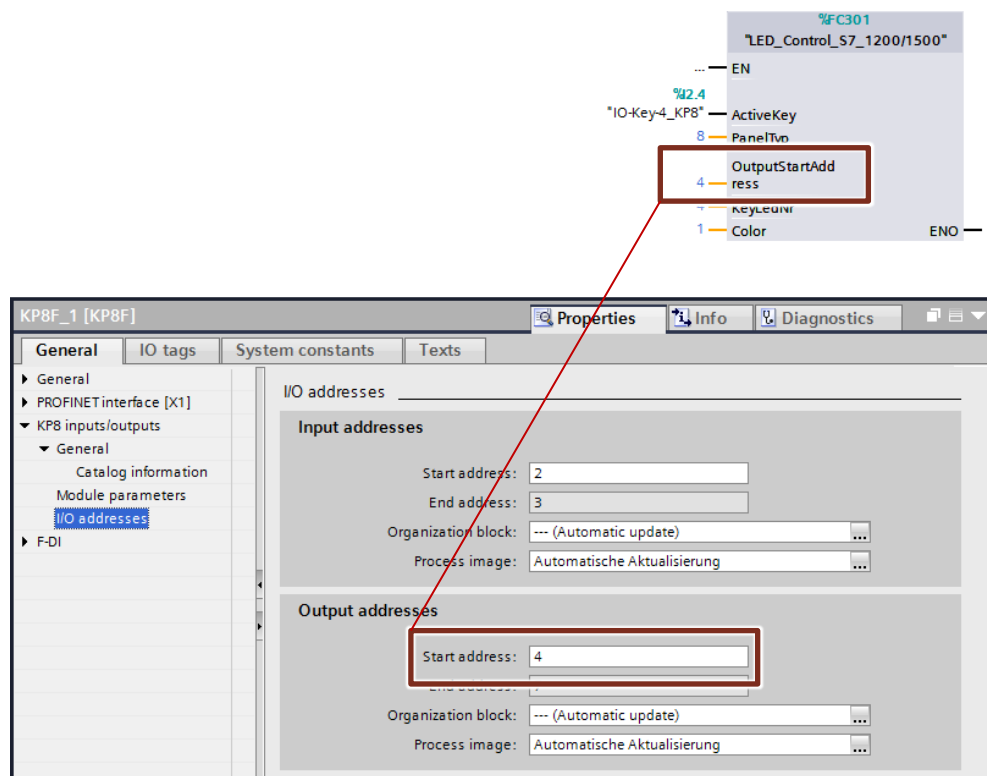
Figure 3-5
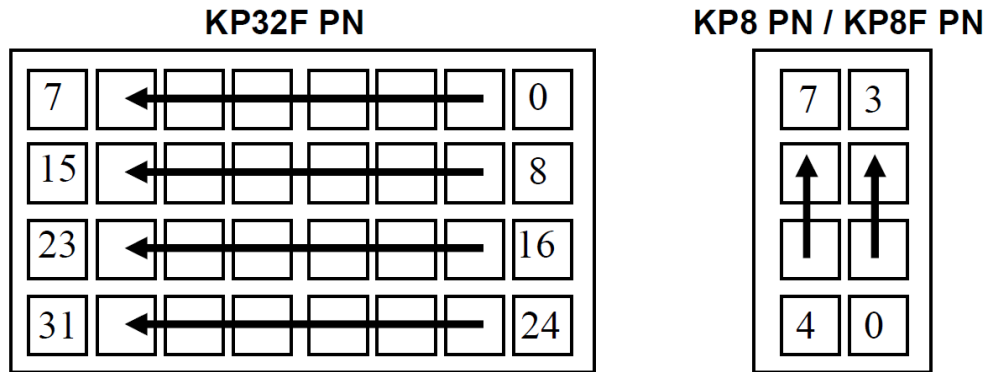
Address assignment of the key panel outputs

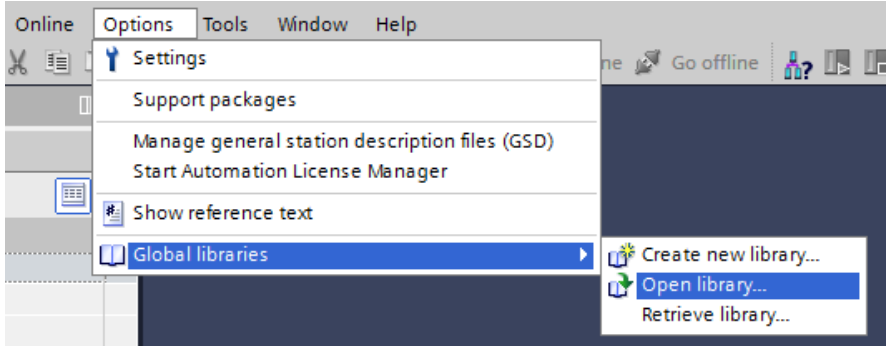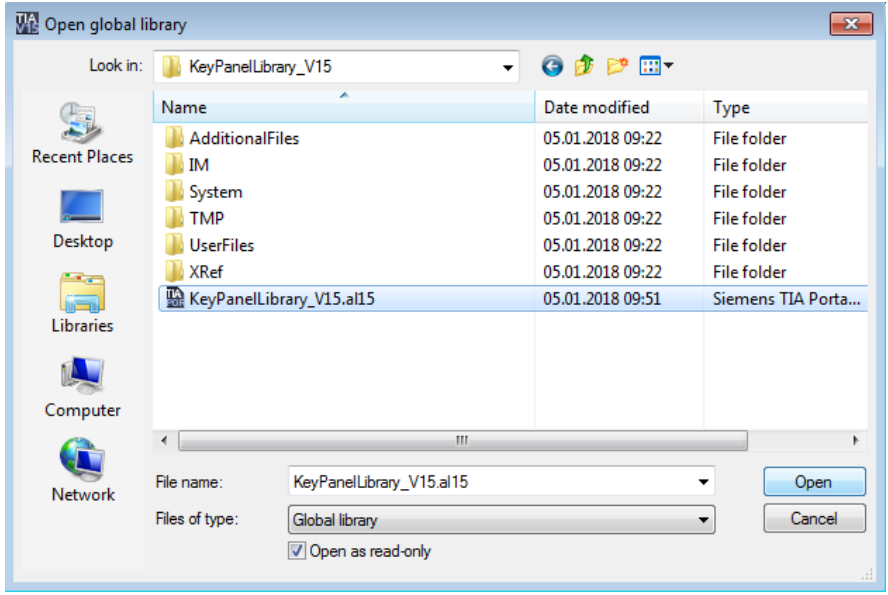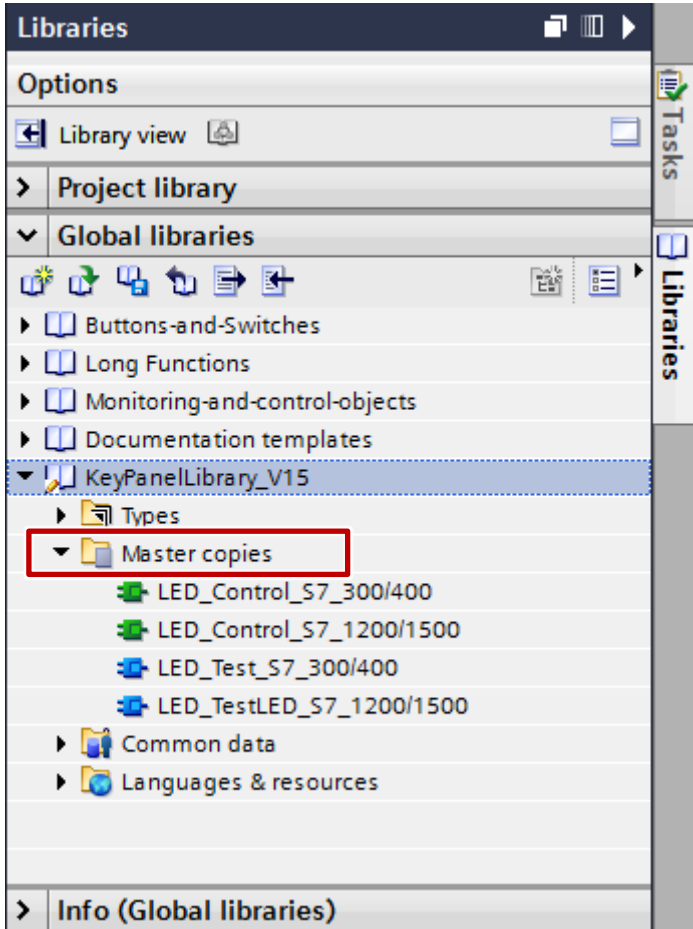Base output address taking the example of a KP8F:

Figure 3-6

4 Configuration Instructions

4.1 Open the Library

Proceed as follows to open the "KeyPanel_Library".

Table 4-1

No.	Action
1.	Unpack the library zip file in a free directory.
2.	Open the TIA Portal.
3.	In the menu you select "Options > Global libraries > Open library...".
4.	Open the directory in which you unpacked the zip file.
5.	Select the "KeyPanelLibrary_V15.al15" file and then click "Open".
6.	In the TIA Portal you click the "Libraries" task card on the right.
7.	Open the library KeyPanelLibrary_V15 with a double-click.

No.	Action
8.	Open the "Master copies" folder.
9.	You can use drag-and-drop to transfer the LED_Control and LED_Test blocks into your project.

4.2 Working with the Library

4.2.1 Introduction

The library includes the blocks for a

- SIMATIC S7-1200 or S7-1500 controller.
- SIMATIC S7-300 or S7-400 controller.

Table 4-2

Block number	Block name	Function
FC300 / FC301	LED_Control	Addressing of the LED for the assigned key on the key panel. Possible colors: red, yellow, green, blue and white. Color and position of the key are set as assignable parameters on the FC. (See Table 3-1)
FB300 / FB301	LED_Test	Lamp test: addresses all the LEDs of the complete key panel.

4.2.2 Procedure

The following example is for a SIMATIC S7-1200 or S7-1500 controller. The procedure for an S7 300/400 controller is the same.

Table 4-3

No.	Action
1.	Drag-and-drop the "LED_Control…." block from the library "KeyPanelLibrary_V15" into the program editor.
2.	Open the organization block "Main".
3.	Insert the function block "LED_Control…." into a network.
4.	Set the inputs as given in Table 3-1 and section 0 (for FC300) and in Table 3-2 and section 3.2.2 (for FB301). Tip: If you put the cursor on a parameter, a tooltip opens showing all the possible inputs.
5.	After successful parameterization you download the configuration to the controller and .test the function

5 Annex

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5.2 Links and Literature

Table 5-1

No.	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Link to the entry page of the application example https://support.industry.siemens.com/cs/ww/en/view/63482149
\3\	SIMATIC HMI operator panels KP8, KP8F, KP32F https://support.industry.siemens.com/cs/ww/en/view/47416561

5.3 Change Documentation

Table 5-2

Version	Date	Change
V1.0	09/2012	First edition
V2.0	11/2012	Edition 02
V3.0	03/2015	Upgrade to version TIA Portal V13 SP1, corrections
V3.1	06/2015	Update of all links
V4.0	06/2018	Change to WinCC (TIA Portal) V15