SIEMENS

SIMATIC HMI

Key Panels Library

Configuration Manual

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

> ⚠ **DANGER**
>
> indicates that death or severe personal injury **will** result if proper precautions are not taken.

> ⚠ **WARNING**
>
> indicates that death or severe personal injury **may** result if proper precautions are not taken.

> ⚠ **CAUTION**
>
> with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

> **CAUTION**
>
> without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

> **NOTICE**
>
> indicates that an unintended result or situation can occur if the relevant information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

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Note the following:

> ⚠ **WARNING**
>
> Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Table of contents

Preface

<div style="text-align: right; font-size: 2em; font-weight: bold;">1</div>

Contents of this document

This document describes the use of the STEP 7 library for Key Panels. The library contains blocks for simplified activation of the keyboard LEDs. The colors of the LEDs are usually mixed by using the matching output bits.

Scope of validity of this document

This documentation is valid for STEP 7 library V1.0 for the Key Panels.

Context of the documentation

The documentation refers to the following operating instructions:

- SIMATIC HMI KP8/KP8F
- SIMATIC HMI KP32F

History

The following editions have been released so far:

Edition	Comment
11/2011	First edition

Installation of Key Panels Library

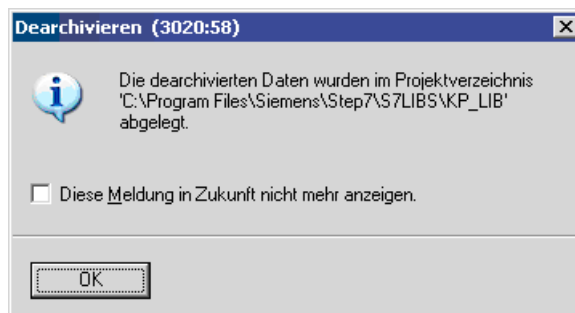<div style="text-align: right; font-size: 3em;">2</div>

System prerequisites

- STEP 7 V5.5

Procedure

To install the Key Panels Library, proceed as follows:

1. Start STEP 7 V5.5.

2. Choose "File> Retrieve" from the menu.

3. Look for the file "KP_LIB.zip" in the following file selection dialog and exit the dialog with "Open".

4. Select a target directory and exit the dialog with "OK".

5. Confirm the subsequent dialogs.

The Key Panels Library is unzipped into the project directory and imported into your project.

Working with the Key Panels Library

<div style="text-align: right; font-size: 3em;">3</div>

Requirement

- Key Panels Library has been successfully installed:

  A new library named "KP_LIB" is available in the "Program Elements" tab of the block editor; it includes all necessary blocks.

Introduction

The library includes one block for each color that can be visualized and one block for all colors that can be visualized.

Color	Block	
RED	KP_RD	FC300
YELLOW	KP_YE	FC301
GREEN	KP_GN	FC302
BLUE	KP_BU	FC303
WHITE	KP_WH	FC304
ALL COLORS	KP_ALL	FC305

You set the color that is activated in the parameters of a block.

Procedure

1. Drag a block from the "KP_LIB" library into the program editor.

2. Configure the block.

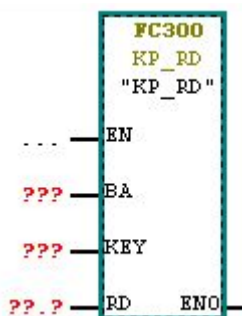3. Download the configuration to the controller.
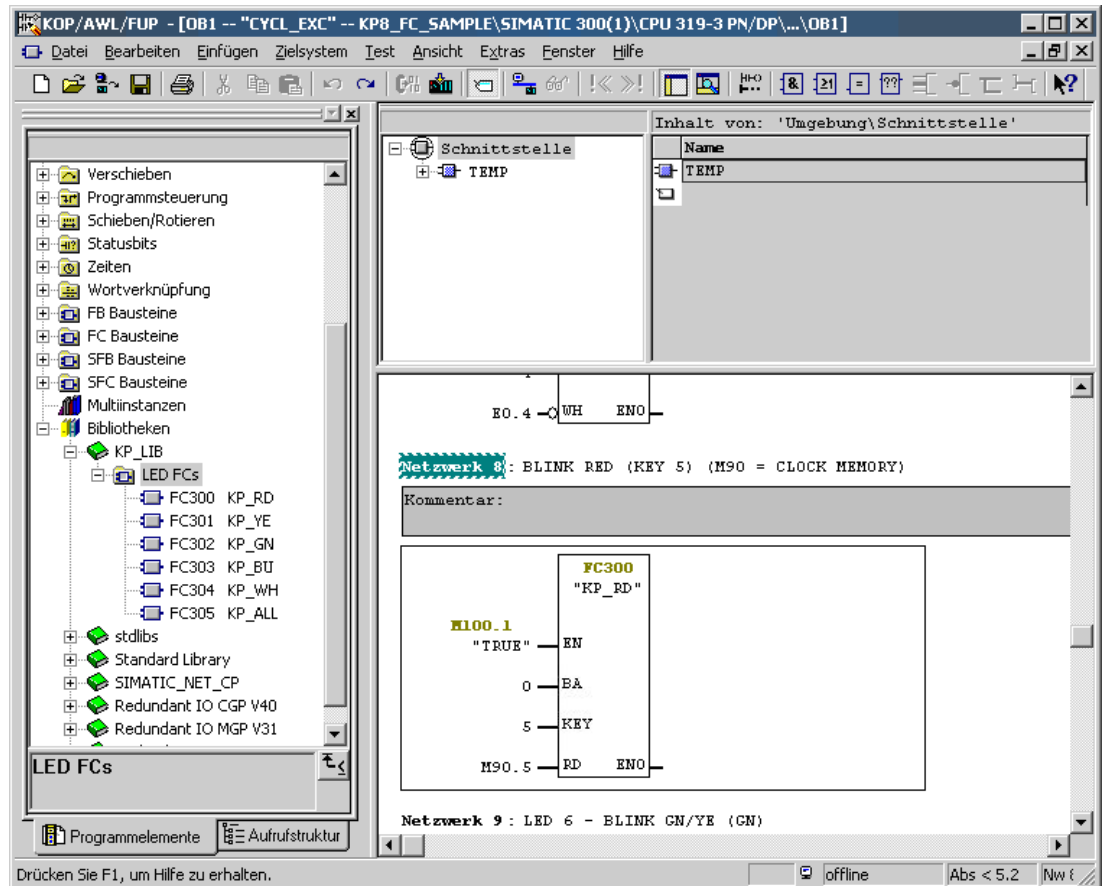
Function description

4

4.1　　FC300 to FC304

Scope

This section describes the function of FC300 (Red) as an example. The description of FC301–FC304 differs only in the color parameter: RD (Red) with FC300, YE (Yellow) with FC301, etc.

Symbol

Parameter

Name	Data type	Memory area	Description	Value range
EN	BOOL	I, Q, M, D, L, T, C	Enable input	0..1
BA	INT	I, Q, M, D, L, const.	Basic address	PLC address range
KEY	INT	I, Q, M, D, L, const.	Index of illuminated pushbutton to be activated	0..7
RD, YE , GN, BU, WH (depending on block type)	BOOL	I, Q, M, D, L, T, C	Switching block color on/off	0..1
ENO	BOOL	I, Q, M, D, L	Enable output	

Description

A signal state of "1" at the enable output "EN" enables the FC block. Illuminants can only be turned on or off in their enabled state. You can use the enable input to disable other FC blocks (see section "Using several colors (Page 12)").

A signal state of "1" at the "RD" input lights up the illuminated pushbutton selected with BA and KEY in red. A signal state of "0" at the "RD" input turns off the illuminated pushbutton.

You address a series of illuminated pushbuttons with BA. KEY activates the key within the series (counted from right to left).

In the following example, FC300 illuminates the third illuminated pushbutton in the first row in red:

- BA = Start address + 0
- KEY = "2"

The start address is the A address of slot 1 as it is stored in HW Config for the Key Panel.

Applies to KP32F only: The second row is not addressed with BA = start address + 1, but with BA = start address + 3 because of the color display with three LEDs each in red, green and blue. For more details, see "Addressing" below.

> ⚠ **WARNING**
>
> **Injuries and damage to material due to incorrect addressing**
>
> The FC block returns the calculated color coding to the basic address BA. If the BA does not exactly match the start address of a series or is even outside the defined address range, data is overwritten at random. This results in unpredictable reactions of the machine or plant.
>
> It may lead to injuries, damages to the plant, destruction of the device and operating errors.
>
> You need to check the basic address BA at the FC block during configuration and the entire operation:
> - BA is different by a multiple of 3 bytes from the A address that is stored in HW Config.
> - BA is located within the address range of slot 1 (Slot 1) and slot 2 (Slot 2, KP32F only) that is stored in HW Config.

Addressing
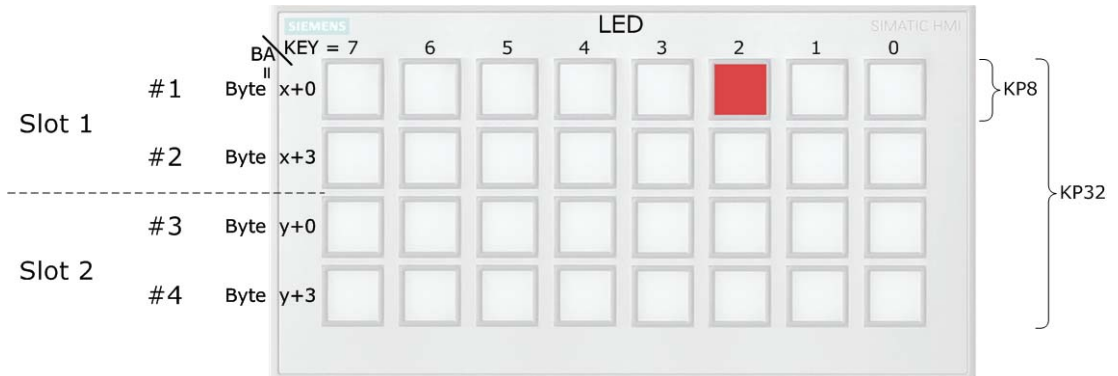
The configuring engineer must enter an address range for slot 1 and, in the case of with KP32F, also for slot 2 in HW Config. All states of all LEDs are stored in this address range:

- KP8: 1 address range of 3 bytes = 8 lights with 3 Red-Green-Blue LEDs each

- KP32F: 2 address ranges of 2 x 6 bytes = 12 bytes = 12 x 8 bits = 4 rows with 8 lights and 3 Red-Green-Blue LEDs each.

The address range of slot 1 starts with start address x (see figure on the top right). The address range of slot 2 starts with start address y.

The parameter BA in the FC block is interpreted as basic address for the row that is to be activated. The FC block writes the color codes as of this address, starting with the red LEDs. Because there are three different LEDs, the basic address must always differ by a multiple of 3 bytes from the start addresses: BA = x+0, x+3, y+0, y+3.

Examples

Continuous addressing:

- Address range slot 1: 17-22

- Address range slot 2: 23-28.

The individual rows are addressed as follows with start address x = 17:

- Row 1: BA = x + 0; address range: 17, 18, 19

- Row 2: BA = x + 3; address range: 20, 21, 22

- Row 3: BA = x + 6; address range: 23, 24, 25

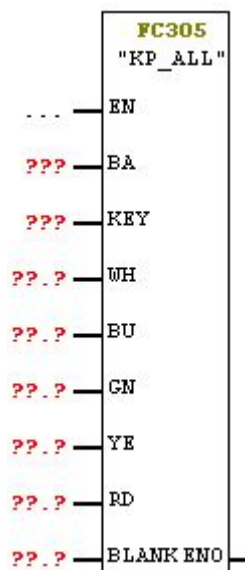- Row 4: BA = x + 9; address range: 26, 27, 28

See also

4.2 FC305

Scope

This section describes the function of the FC305 that combines all colors in one FC block. For this reason, we only describe the differences to FC300 to FC304 (Page 8).

Symbol

```
        FC305
       "KP_ALL"
 ...─┤EN
 ???─┤BA
 ???─┤KEY
??.?─┤WH
??.?─┤BU
??.?─┤GN
??.?─┤YE
??.?─┤RD
??.?─┤BLANK ENO├
```

Parameter

The BLANK parameter: A signal state of "1" at the "BLANK" input turns off the selected illuminated pushbutton, regardless of the states of the other inputs.

Description

You can swap colors with FC305: A signal state of "1" at the "RD" input lights up the illuminated pushbutton selected with BA and KEY in red. A signal state of "0" at the "RD" input turns off red. A signal state of "1" at the "GN" input lights up the illuminated pushbutton in green.

If the signal state "1" is present at several inputs at the same time, the color priority decides which color is displayed (see section "Using several colors (Page 12)").

> ⚠️ **WARNING**
>
> **Injuries and damage to material due to incorrect addressing**
>
> The FC block returns the calculated color coding to the basic address BA. If the BA does not exactly match the initial address of a series or is even outside the defined address range, data is overwritten at random. This results in unpredictable reactions of the machine or plant.
>
> It may lead to injuries, damages to the plant, destruction of the device and operating errors.
>
> You need to check the basic address BA at the FC block during configuration and the entire operation:
> - BA is different by a multiple of 3 bytes from the A address that is stored in HW Config.
> - BA is located within the address range of slot 1 and slot 2 (KP32 only) that is stored in HW Config.

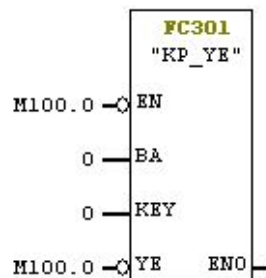## 4.3 Using several colors

FC300 to FC304

If you use several FC blocks to display different colors at an LED, the color that is displayed is not defined if the FC blocks are enabled at the same time. For example, only one FC block is enabled when you invert the other enable input EN.

Example

M100 is a clock memory byte. The program makes key 6 flash green/yellow. If FC302 is enabled by EN, FC301 is disabled and vice versa. You accomplish this with the negation of the M100.5 clock memory bit.
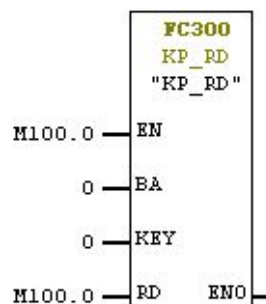
```
Netzwerk 2: Titel:

Kommentar:

                        FC301
                        "KP_YE"

        M100.0 ─○ EN

             0 ── BA

             0 ── KEY

        M100.0 ─○ YE        ENO ─
```

```
Netzwerk 3: Titel:

Kommentar:

                        FC300
                        KP_RD
                        "KP_RD"

        M100.0 ── EN

             0 ── BA

             0 ── KEY

        M100.0 ── RD        ENO ─
```

FC305

If the signal state "1" is present at several inputs RD, YE, etc. at the same time, the color with the highest priority is activated:

Priority	Parameter	Color
1	RD	Red
2	YE	Yellow
3	GR	Green
4	BU	Blue
5	WH	White

Example: YE = WH = 1. The selected illuminated pushbutton lights up in yellow.