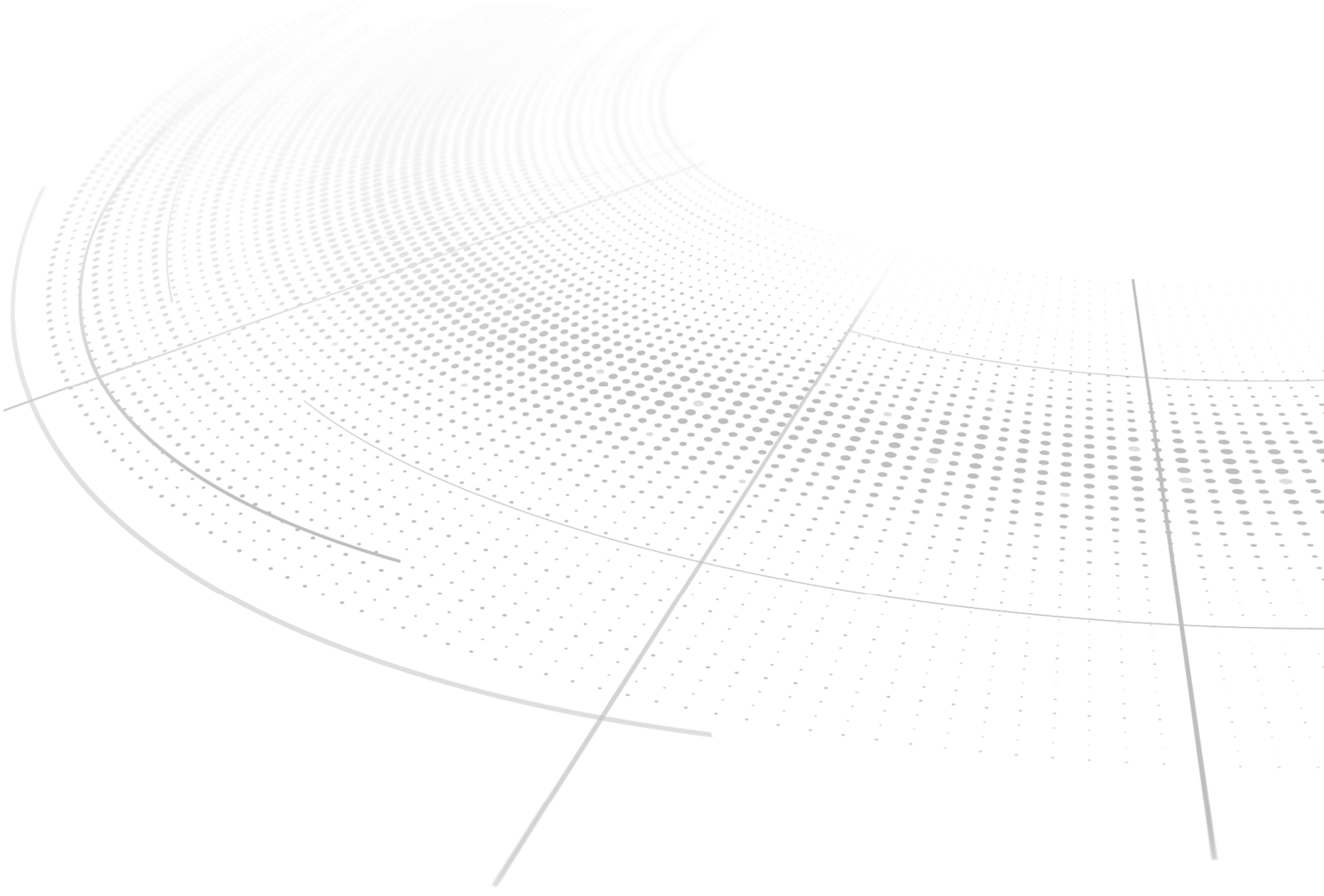
Adaptation of SW-screens in TIA depending on HW-screen resolution



Original-Handbuch | deu
Geräteart:

Baureihe:

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1. About these instructions

1.1. Copyright and disclaimer

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1.2. Translation

The translation of this documentation is carried out with the help of machine translation to ensure a fast and efficient transfer of the content into different languages. Modern machine translation tools are used, which are continuously improved to increase accuracy and comprehensibility. Nevertheless, the translation is proofread by our staff to ensure the quality of the content and language. We make every effort to translate the contents of this documentation correctly and comprehensibly in different languages. Nevertheless, translation errors may occur. We do not accept any liability for any damage caused by incorrect or misleading translations. In case of doubt, the original version of the documentation in German is decisive.

1.3. Release

Aim of the instruction		Quality improvement in line with the company's guiding principles	
Author	Creation date	KOJ	23.07.2025
Document number		TRS-xxxxxx	

1.4. Change index

This page of the document shows the current version status with the corresponding date and author. Drawings that may be in the appendix are provided with their own revision index.

Version	Amendment	Reason for change	Date	Author
1.0	Created		23.07.2025	KOJ

1.5. Fundamentals

Read these instructions carefully before use and keep them in a safe place.
After installation, pass the instructions on to the user and, in the event of resale, to the user with the product.

1.5.1 Target group

These instructions are intended for persons who commission, configure, operate and maintain a product.

2. Safety instructions

The basic safety instructions precede the instructions. The chapter "Safety instructions" warns of basic dangers that can occur in several phases of product use and must always be observed by the product user.

2.1. Classification of the notes

These operating instructions contain information that you must observe for your personal safety and to prevent damage to property. A distinction is made between basic safety instructions and warnings.

2.2. Warnings

Warnings are placed within the documents at the specific danger points. They are placed immediately before the action that poses a danger. The warnings are highlighted by a warning triangle and are displayed as follows depending on the degree of danger:

Warning signs	Meaning
⚠ DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
ATTENTION	ATTENTION indicates a situation that can lead to material damage if it is not avoided.
IMPORTANT	IMPORTANT indicates an essential or priority aspect or a course of action.
NOTE	NOTE indicates general information.

Tabe 2.1: Type of safety instruction

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2.3. Structure of warning notices

The SAFE method is a procedure for the systematic design of safety instructions. The acronym SAFE stands for the four principles:

⚠ WARNING **Risk of cuts from sharp-edged metal sheets.** It can lead to cuts. ▸ Wear cut-resistant gloves ▸ If possible, deburr the sharp edges of the sheets.	➢ Severity of the hazard (signal word) ➢ Type and source of danger ➢ Consequences of ignoring the danger ➢ Escape (measures to avert the danger)

Misapplication	Type and source of danger.
Warning signs	Warning signs according to the risk assessment.
Reasons for misuse	Describes possible reasons for misuse.
Possible consequences of misuse	Describes the consequences of non-compliance.
Security measure	Indicates how to avoid the hazard.

Table 2.2: Structure of a safety notice

2.4. Additional information

Example ESD area:

ESD protection measures according to DIN EN 61340-5-1 must be observed.

Example reference:

Refer to chapter X.X. for the corresponding structure.

3. Foreword

The projects and tests described within this document, were carried out with TIA version V20 and WinCC Advanced/Unified in version V20. There are differences between V20 and its predecessors. In case these differences may play a role, consult Siemens knowledge Base or contact Siemens support directly https://sieportal.siemens.com/en-us/support.

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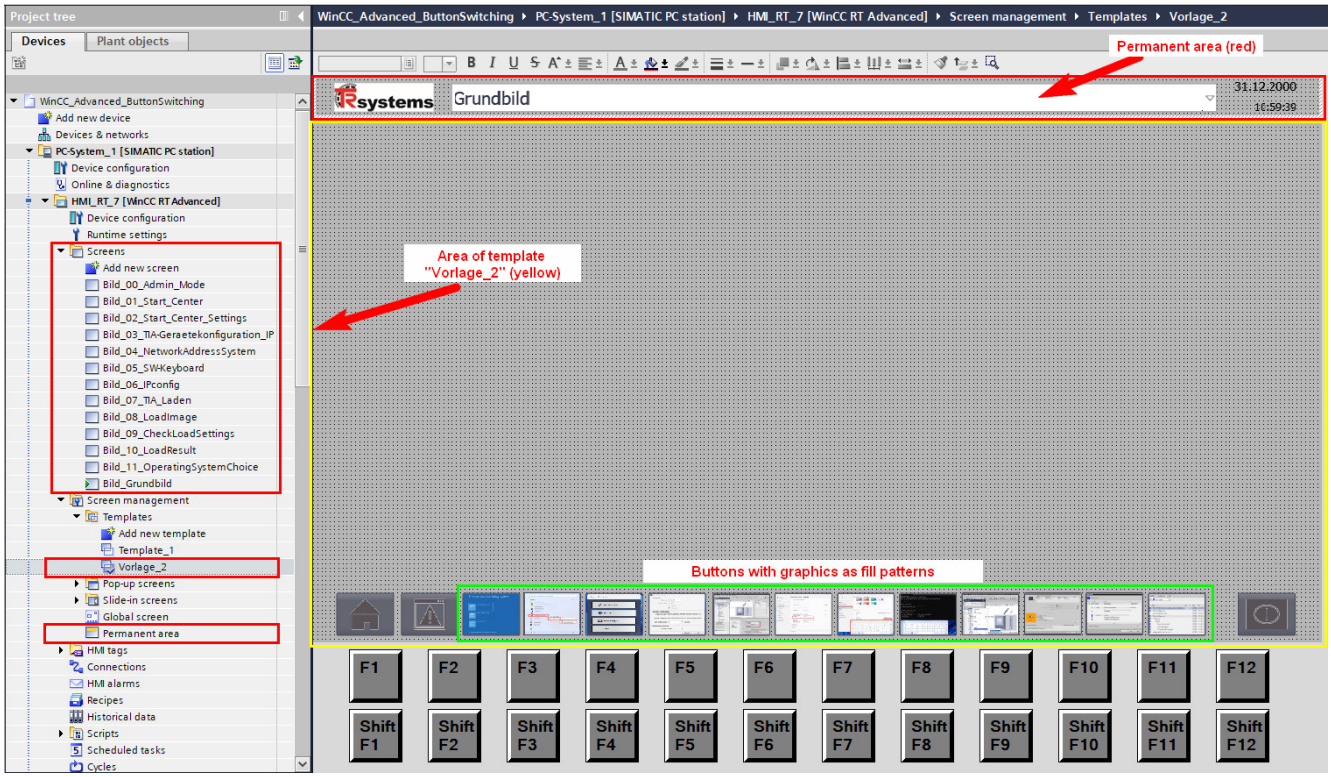
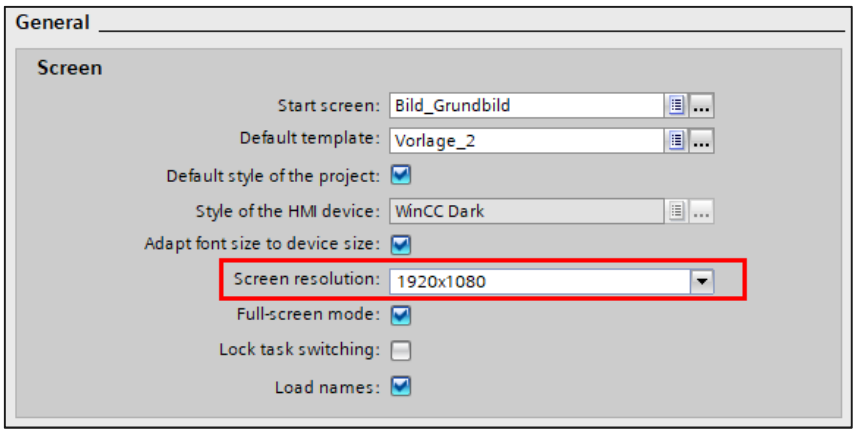
4. The base project of 1920x1080 (full HD) resolution

The project used in this example has 13 screens which were all derived from a template called “Vorlage_2”. In the screenshot below all 13 screens are visible on the left side in the project tree area and start with screen “Bild_00_Admin_Mode” up to “Bild_Grundbild”.

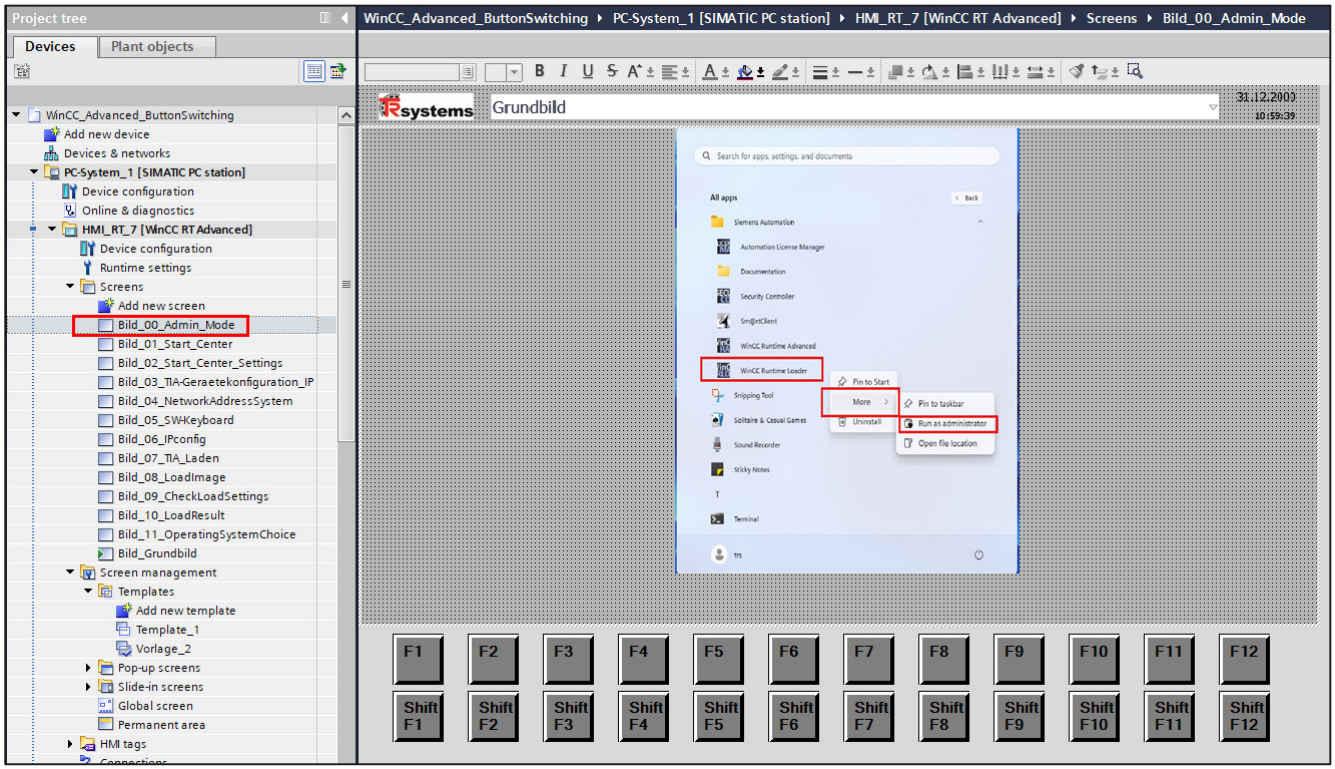
Each screen has a permanent area on its top which consists of a label TRsystems, symbolic I/O field and date / time fields. The part below the permanent area is made up by template “Vorlage_2” which consists of 15 buttons of which 12 incorporate graphics as fill patterns.

Since the screen resolution has been chosen to be 1920x1080 all screens perfectly fit the hardware resolution of 1920x1080. Softkeys are not visible.

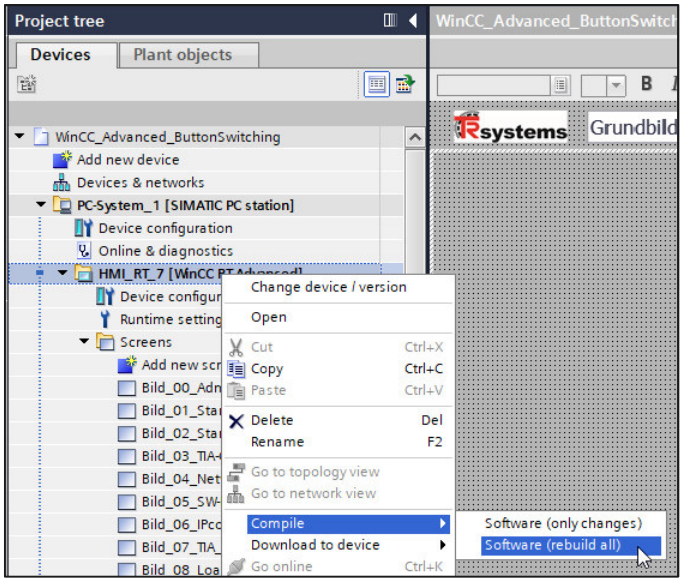




Each screen consists of a graphic which in case of “Bild_00_Admin_Mode” is visible in the following screenshot. The buttons of template “Vorlage_2” are not visible at this moment. They become visible once the application has been compiled and loaded on the target hardware.
The purpose of the final application is some kind of a presentation where with each button press the corresponding screen with its particular graphic gets displayed.



Since there are graphics used as fill patterns for buttons but also used for presentation purposes at the same time, the compiler displays warnings at compile time. These warnings however are not critical.



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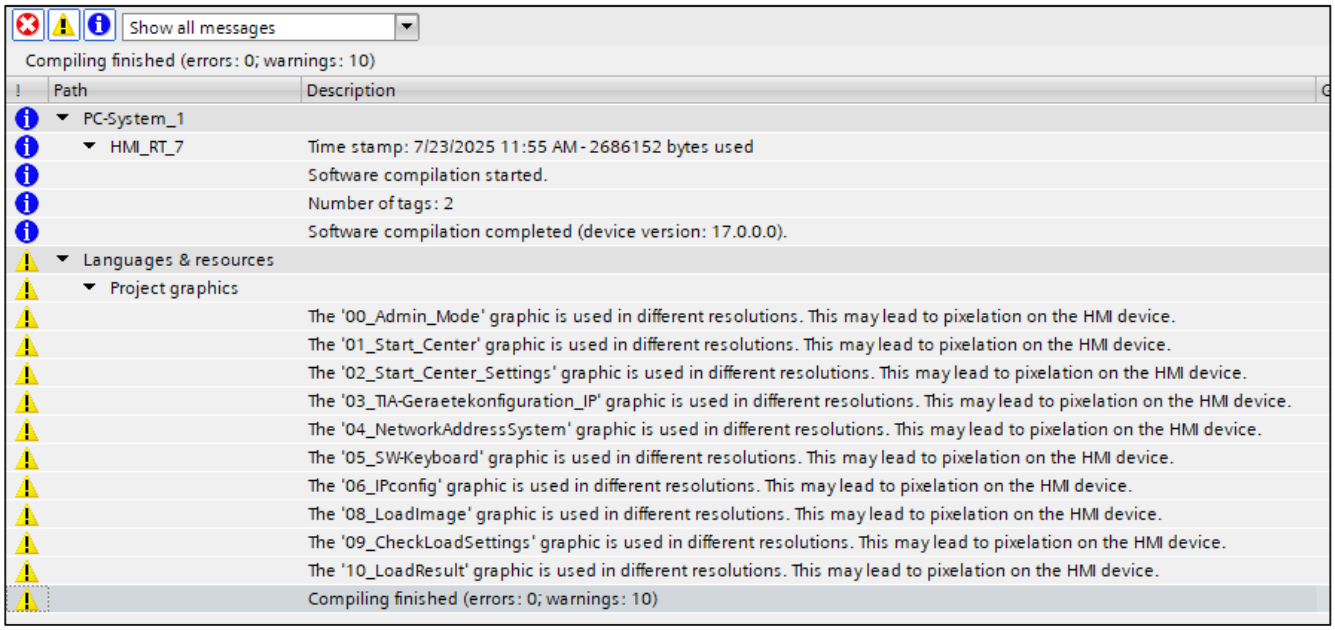
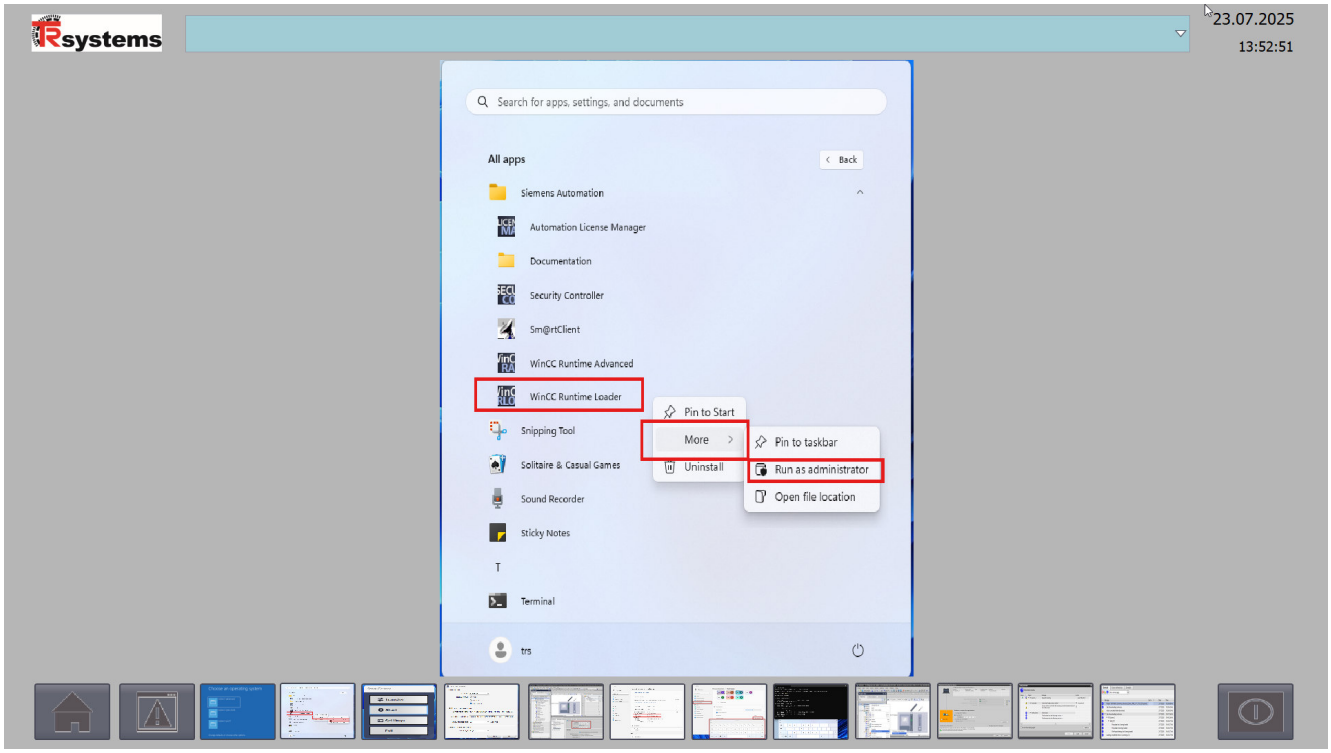


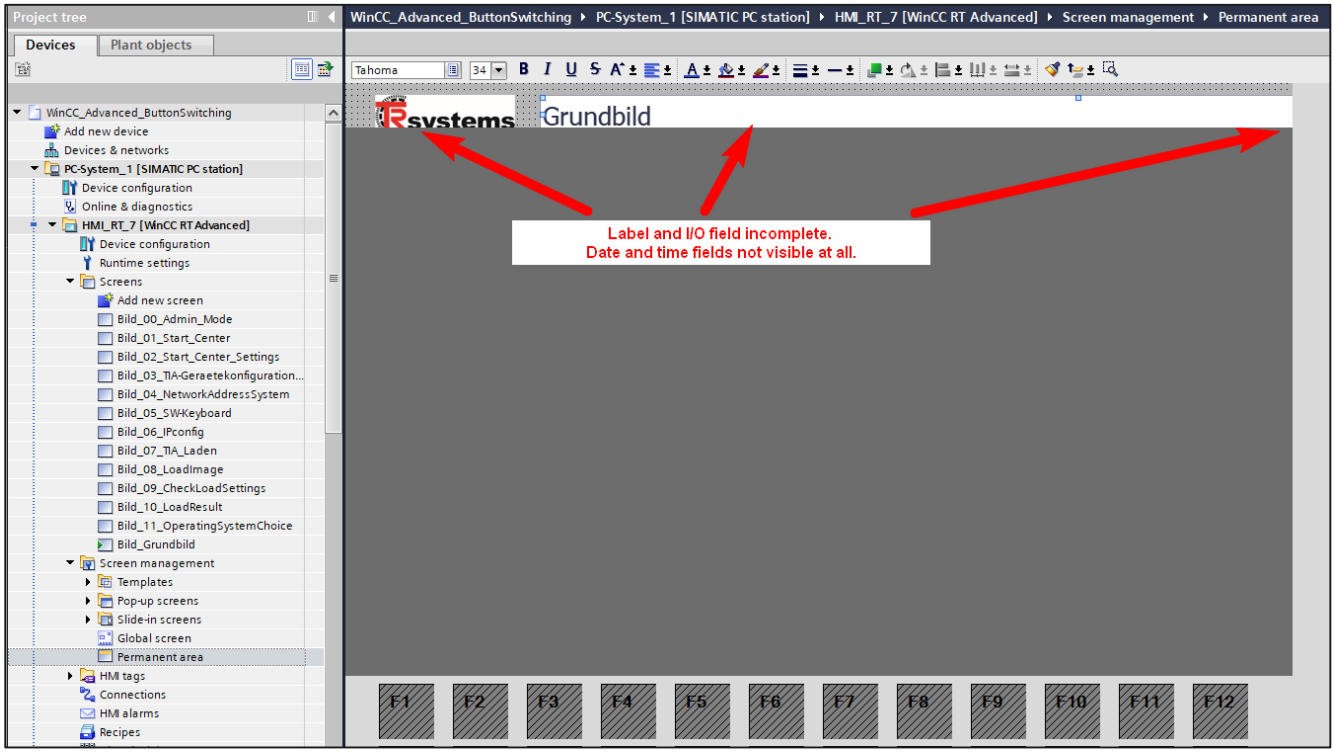
In combination with buttons of template “Vorlage_2” the final active screen “Bild_00_Admin_Mode” looks as depicted in the following screenshot. The user is now able to switch between screens just by pressing the corresponding button.



5. Conversion from 1920x1080 (full HD) to 1280x800 (WXGA)

As long as the target hardware has a resolution of 1920x1080, display of screens is going to work perfectly.
If we change the hardware to 1280x800 now and assume that things are fully done just by adapting the runtime settings to 1280x800 and recompiling the project then we are wrong.

If we look at what happens with the permanent area just by switching to 1280x800 then it becomes obvious that the graphical elements are not properly displayed or not visible at all.



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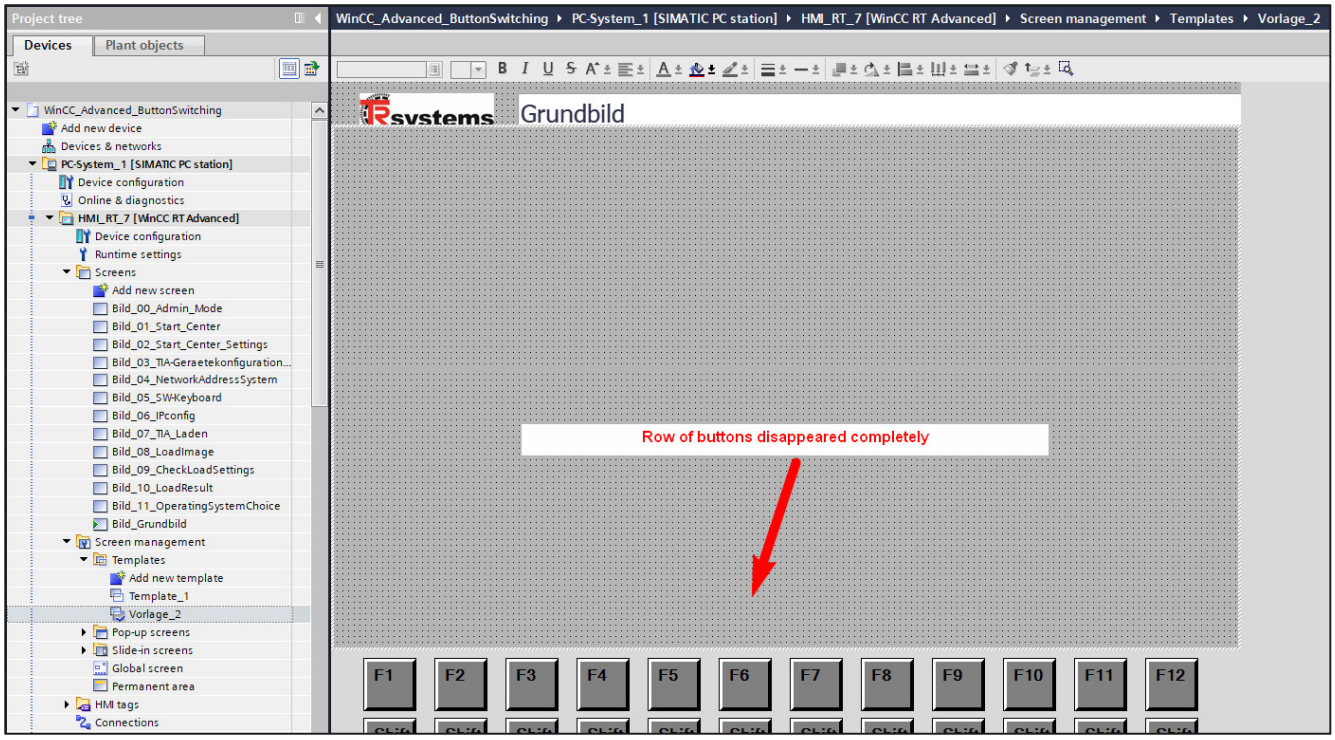
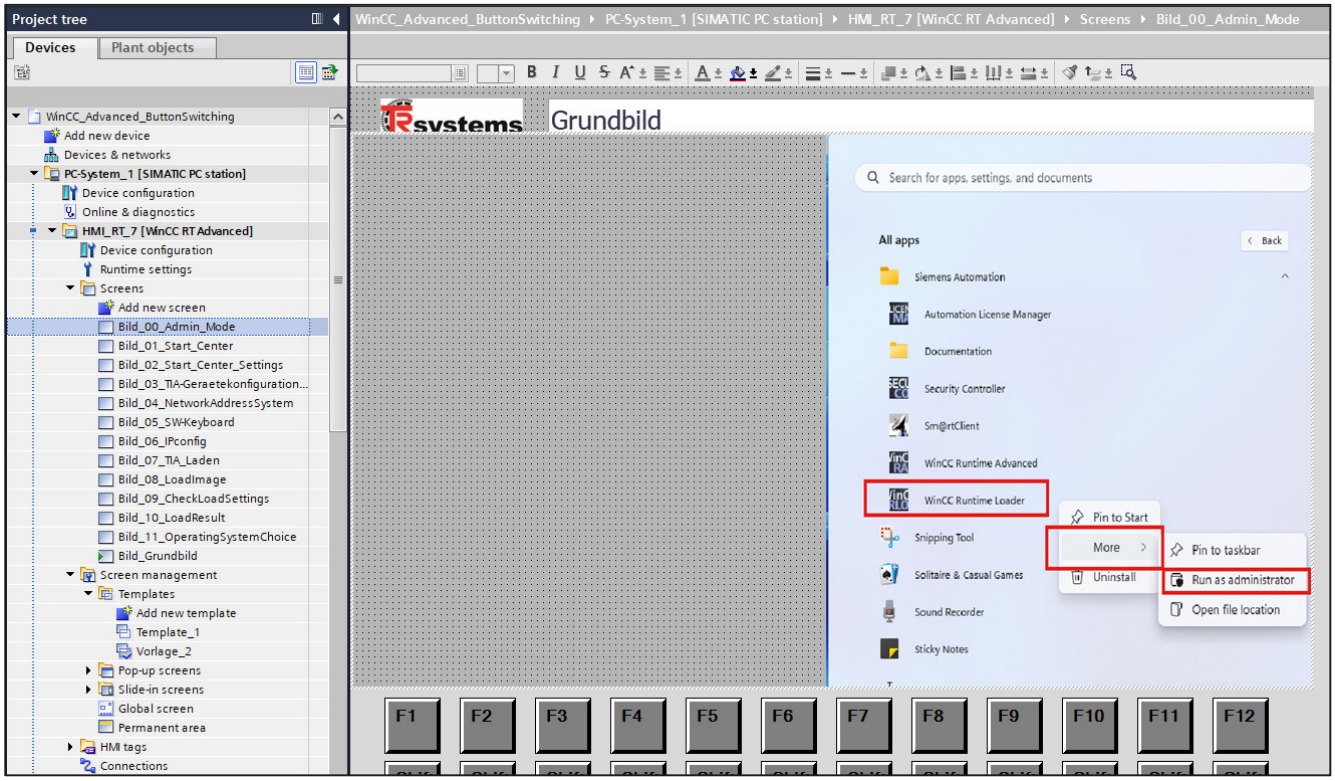
A similar situation applies when we look at template “Vorlage_2”. The row of buttons completely disappeared.



The change of resolution has a negative impact on all screens. The following picture shows the situation in case of screen “Bild_00_Admin_Mode” where part of the graphic is outside of the visible area.



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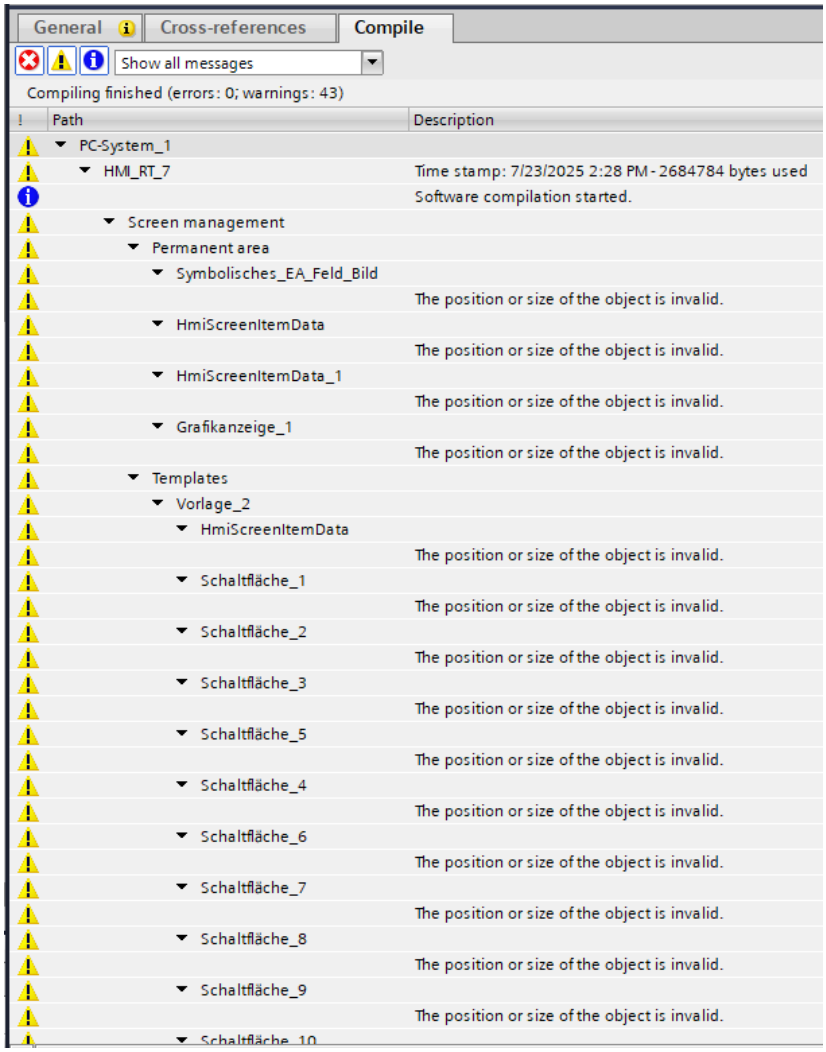
Finally, if we now compile the project without any changes, the compiler displays many warnings which are very critical – simply because the respective graphical objects do not get properly displayed or not displayed at all.



The solution for adapting the application to the new runtime settings is very straight forward and is a “try and error” approach.

1. Switch to the higher resolution where all graphical elements are visible and properly displayed
2. Adapt size and position of elements and switch back to the desired resolution
3. If there is a need to make corrections, simply repeat steps 1 and 2 until you are comfortable with the result.

Repeat steps 1 up to 3 in the order of adapting:

1. Permanent area
2. The template(s)
3. The screen(s)

Compile the project until it runs error free and without critical warnings.