



BESENIX
AUTOMATION SUITE

USER MANUAL

Besenix HMI Screen Manager V21

Import, export and safely manage WinCC HMI screens through TIA Portal Openness.

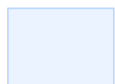
Software version 1.1.1

Designed for TIA Portal V21

Windows 10 and Windows 11

BESENIX AUTOMATION SUITE

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Contents

This manual covers installation, connection, all supported HMI workflows, package validation, safety and troubleshooting for version 1.1.1.

SECTION	SUBJECT
01	Overview and supported HMI families
02	Requirements and first-time setup
03	Connection and main window
04	Classic WinCC XML workflow
05	SIMATIC Unified JSON workflow
06	Static Screen Package workflow
07	AI-assisted screen creation
08	Safety and best practices
09	Troubleshooting
10	Quick reference and support
11	Version 1.1.1 release information

SCOPE

This manual documents application behavior. It does not replace Siemens product documentation, project-specific engineering rules or commissioning procedures.

Overview

A focused Windows engineering tool for moving HMI screens and prepared graphic packages into and out of an open TIA Portal V21 project.

What the application does

- CHECK** Connects to the currently open TIA Portal V21 project through TIA Portal Openness.
- CHECK** Detects Classic WinCC and SIMATIC Unified HMI devices in the project.
- CHECK** Exports and imports Classic HMI screens using native TIA XML files.
- CHECK** Exports and reconstructs Unified screens using structured JSON engineering snapshots.
- CHECK** Validates and imports Besenix Static HMI Screen Packages containing Classic screen XML and project graphics.
- CHECK** Creates an automatic XML backup before deleting Classic screens.
- CHECK** Can authorize the current Windows account for TIA Portal Openness after administrator approval.
- CHECK** Provides an activity log for connection, export, import, warning and error messages.

IMPORTANT

The application changes the offline TIA Portal project only. It does not download data to a PLC or HMI panel. Save or archive the project before importing or deleting screens.

Supported workflow by HMI family

FUNCTION	CLASSIC WINCC	SIMATIC UNIFIED
Screen listing	Supported	Supported, including groups
Export	Native XML	Structured JSON snapshot
Import	Native XML with Override	Best-effort JSON reconstruction
Static package	Screen XML plus project graphics	Not supported
Safe delete	Supported with automatic XML backup	Disabled

Requirements and first-time setup

System requirements

- CHECK** Windows 10 or Windows 11.
- CHECK** Siemens TIA Portal V21 installed.
- CHECK** TIA Portal Openness V21 with the net48 Public API installed.
- CHECK** A Windows account that belongs to the local Siemens TIA Openness group.
- CHECK** TIA Portal and Besenix HMI Screen Manager running under the same Windows user.

Application package

FILE	PURPOSE
Besenix_HMI_Screen_Manager.exe	Packaged application for normal use.
Besenix_HMI_Screen_Manager.ps1	PowerShell source included in the build kit.
BUILD_EXE.bat / Build_Besenix_EXE.ps1	Optional scripts for rebuilding the executable.
STATIC_SCREEN_PACKAGE_FORMAT.txt	Technical description of the validated static package format.
RELEASE_NOTES_v1.1.1.txt	Changes included in this release.

First launch

- 1 Install TIA Portal Openness**
Open TIA Portal V21 Setup, choose Modify and enable the TIA Portal Openness option if it is not already installed.
- 2 Start the application**
Run Besenix_HMI_Screen_Manager.exe from a permanent folder. Keep the executable in a location where your Windows account has normal read and execute access.
- 3 Authorize the Windows user**
If required, click AUTHORIZE WINDOWS USER. Approve the administrator prompt. The application adds the current account to the local Siemens TIA Openness group.
- 4 Restart Windows**
A restart is required after a user is newly added to the Siemens TIA Openness group.

SECURITY

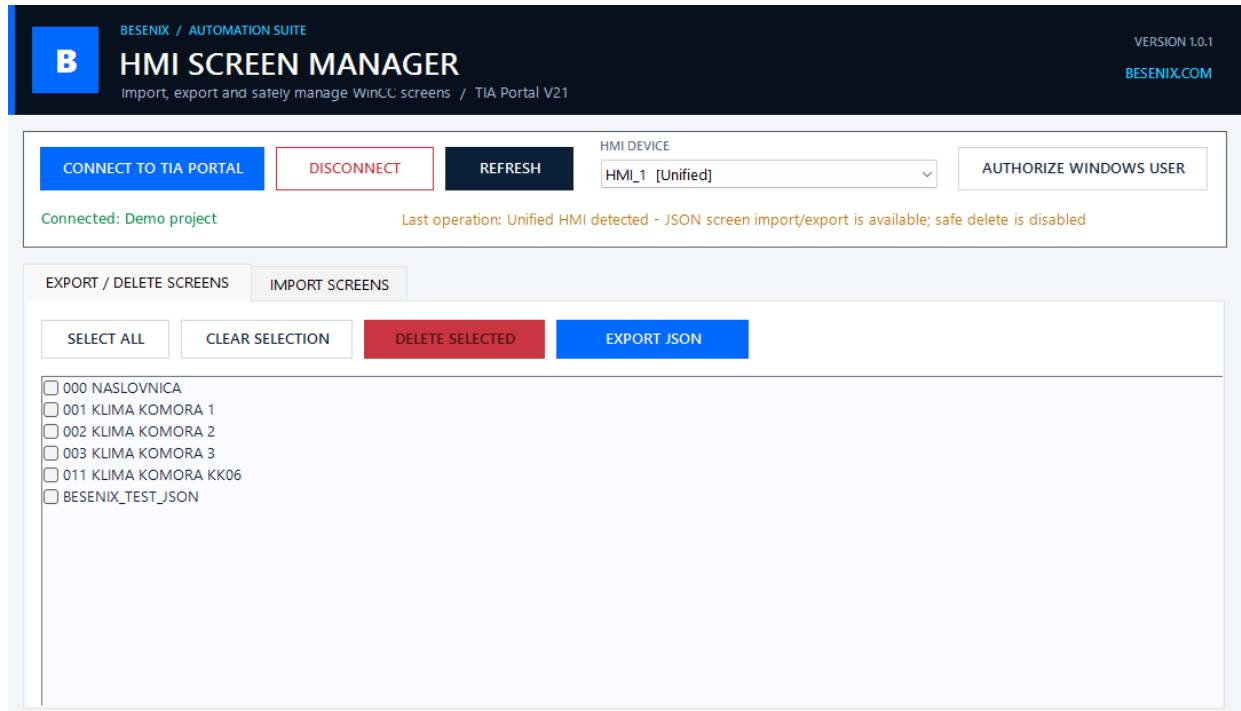
Only authorize the Windows account that will operate TIA Portal. Do not share administrator credentials or run files obtained from an untrusted source.

If TIA Portal Openness is missing

The application stops with a message that TIA Portal Openness V21 was not found. Run TIA Portal V21 Setup, choose Modify, enable TIA Portal Openness, finish the installation and start the application again.

Connect to TIA Portal

Always open and save the required TIA project before connecting the application.



Actual Besenix HMI Screen Manager interface. Project information shown here is a neutral demonstration.

1

Open TIA Portal V21

Open exactly one TIA Portal instance and load the project that contains the required HMI device.

2

Save the project

Save current changes and close any screen editor that could lock the screen being imported or replaced.

3

Connect

Click CONNECT TO TIA PORTAL. If the Siemens Openness confirmation appears, allow the connection.

4

Select an HMI device

Choose the required device from HMI DEVICE. The family is shown as [Classic] or [Unified].

5

Verify the screen list

Confirm that the expected screens are visible. Use REFRESH after changing the project in TIA Portal.

MULTIPLE INSTANCES

If several TIA Portal instances are open, the application uses the first available instance. Close unrelated instances before connecting.

Classic WinCC workflow

Classic HMI devices use the native TIA Portal XML import and export mechanisms.



and a test project containing a unified HMI device is

Actual TIA Portal V21 project with a Classic HMI screen open before screen transfer.

Export Classic screens

1

Select the Classic device

Choose an HMI device marked [Classic].

2

Select screens

Open EXPORT / DELETE SCREENS and check one or more screens.

3

Export

Click EXPORT SELECTED and choose a destination folder.

4

Keep the export folder

The application creates a timestamped TIA_HMI_XML_Export folder containing one native XML file per screen.

Import Classic screens

1

Open Import Screens

Select IMPORT SCREENS, then click ADD XML FILES.

2

Review the list

Confirm that every selected file belongs to a compatible TIA Portal project and HMI family.

3

Import

Click IMPORT XML SCREENS and confirm the operation.

4

Compile and inspect

The native TIA import uses Override for a screen with the same name. Open the screen, compile the HMI and review the result.

Safely delete Classic screens

1

Select screens

Check only the screens that should be removed.

2

Delete selected

Click DELETE SELECTED and review the confirmation list carefully.

3

Automatic backup

Before deletion starts, the application exports every selected screen to a timestamped TIA_HMI_Deleted_Screens_Backup folder on the Windows Desktop.

4

Verify

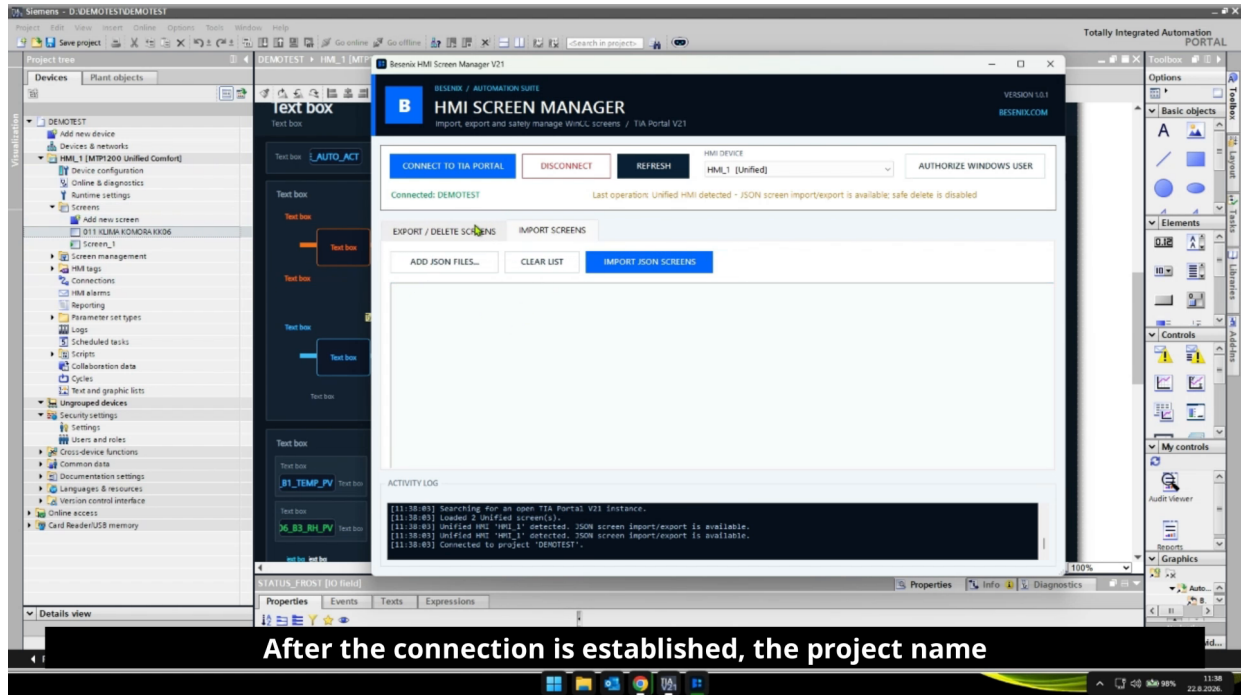
Deletion does not begin if the backup fails. After success, save the TIA project and keep the backup until the project is validated.

OVERWRITE WARNING

Classic XML import can replace a screen with the same name. Archive the project before importing and verify the target device before confirming.

SIMATIC Unified workflow

Unified screens use structured Besenix JSON engineering snapshots. They are not native Siemens screen export files.



After the connection is established, the project name

Actual Besenix HMI Screen Manager connection to a Unified HMI device in TIA Portal V21.

Export Unified screens

1

Select the Unified device

Choose an HMI device marked [Unified]. The application also lists screens inside Unified screen groups.

2

Select screens

Check one or more screens in EXPORT / DELETE SCREENS.

3

Export JSON

Click EXPORT JSON and choose a destination folder.

4

Keep the snapshot files

The application creates timestamped .unified-screen.json engineering snapshots containing the screen structure, supported properties, objects and event information.

Import Unified screens

1

Select Import Screens

Click ADD JSON FILES and choose snapshots created for the Unified workflow.

2

Start import

Click IMPORT JSON SCREENS and read the replacement warning.

3

Temporary reconstruction

The importer first creates a temporary Unified screen. An existing screen with the same name is replaced only after reconstruction succeeds.

4

Read the activity log

Unsupported objects, properties or event actions are reported as IMPORT WARNING messages. Up to 20 detailed warnings are shown; additional warnings are summarized.

5

Compile and validate

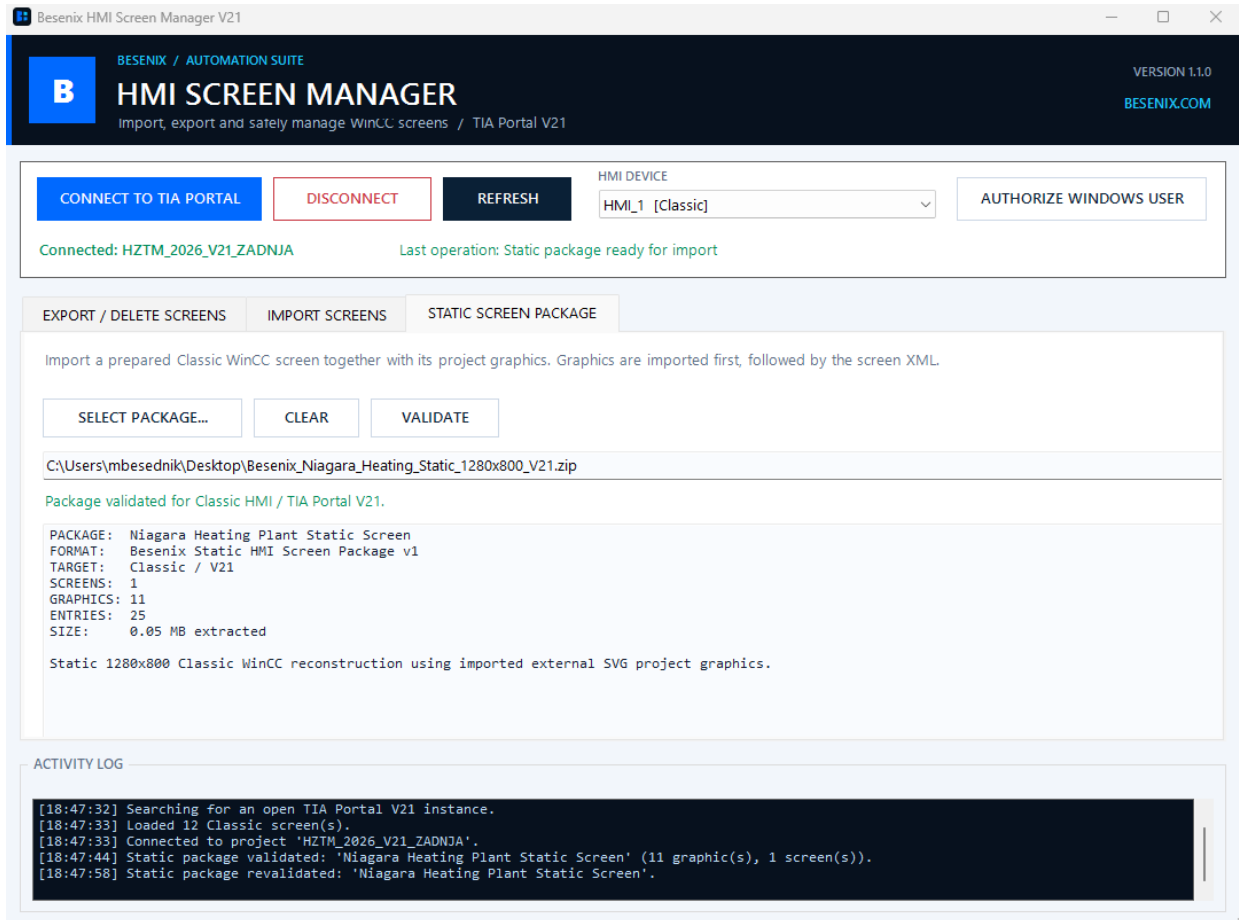
Open the imported screen in TIA Portal, compare it with the source, repair skipped items if necessary and compile the HMI device.

UNIFIED LIMITATION

Unified import is best-effort reconstruction through the installed TIA Openness object model. Availability of screen item types and properties can differ between TIA installations. Safe deletion is disabled for Unified devices.

Static Screen Package workflow

Version 1.1.1 can validate and import a prepared Classic WinCC screen together with its external project graphics in one controlled operation.



Actual Static Screen Package validation view. The captured v1.1.0 screen shows the same package data; version 1.1.1 places IMPORT STATIC PACKAGE directly to the right of VALIDATE.

What a package contains

A Besenix Static HMI Screen Package is a ZIP archive with a manifest.json file in its root. The manifest lists the Classic screen XML files and Project Graphics XML files that belong to the screen. Graphics are imported first so the screen can resolve the referenced SVG resources.

ITEM	REQUIREMENT
Format	Besenix Static HMI Screen Package
FormatVersion	1
TargetFamily	Classic
TiaVersion	V21
Screens	One or more relative Classic screen XML paths
Graphics	Relative Project Graphics XML paths

Import procedure

1

Select a Classic HMI

Connect to TIA Portal and choose an HMI device marked [Classic]. Static packages are not available for Unified devices.

2

Open Static Screen Package

Select the STATIC SCREEN PACKAGE tab and click SELECT PACKAGE.

3

Validate before import

The application checks the ZIP structure, manifest format, TIA version, HMI family, safe relative paths and the listed Classic screen XML files.

4

Review the package summary

Confirm the package name, screen count, graphic count, extracted size and description. Stop if any value is unexpected.

5

Import

In version 1.1.1 click IMPORT STATIC PACKAGE immediately to the right of VALIDATE. Confirm the operation. Project graphics are processed first, followed by the screen XML.

6

Compile and inspect

Open the imported screen, verify every external graphic and object, then compile the HMI device in TIA Portal.

REPLACEMENT BEHAVIOR

Matching project graphics and screens use the Siemens Override option. Save or archive the target project before importing.

SECURITY

The importer rejects unsafe ZIP paths and unsupported package metadata, extracts into a temporary folder and removes the temporary content after the operation.

AI-assisted screen creation

Besenix HMI Screen Manager does not contain an AI model. It provides structured XML, JSON and validated static packages that can support an external AI-assisted engineering workflow.

Recommended workflow

1

Start with a proven screen

Export a simple screen from the same HMI family, device generation and TIA Portal version as the target project.

2

Create a separate working copy

Never give an AI tool the only backup. Remove customer names, addresses, credentials, production values and other confidential information before sharing a file with an external service.

3

Give precise instructions

Ask the AI to preserve the file format, format version, supported type names and required object structure. Request a small, controlled change first.

4

Validate the file

Compare the generated file with the exported reference. Do not import malformed JSON, XML from an unknown source or types that are not available in the installed TIA version.

5

Import into a test project

Use Besenix HMI Screen Manager to import the result into a duplicate or test project before using it in production engineering.

6

Review and compile

Inspect every object, property, event, tag reference, color, font and navigation action in TIA Portal. Resolve activity-log warnings and compile the HMI.

Example prompt structure

PROMPT

Use the attached Unified JSON snapshot as a structural reference. Preserve Format, FormatVersion, Data.Type and available Siemens HmiUnified type names. Create a new screen named Demo_AI_Screen with a white background, a green title reading TEST and only properties demonstrated in the reference. Return valid JSON only. Do not invent unavailable type names.

**ENGINEERING
RESPONSIBILITY**

AI output must be treated as unverified engineering input. A qualified engineer remains responsible for validation, safety, access control, alarm behavior and commissioning.

Safety and best practices

Before every import or deletion

- CHECK** Save the TIA Portal project.
- CHECK** Create a TIA Portal archive or a verified project backup.
- CHECK** Close open screen editors for screens that may be replaced.
- CHECK** Confirm the selected HMI device and family.
- CHECK** Use exported files from a trusted source and compatible project version.
- CHECK** Test AI-assisted files in a duplicate project first.

After every import

- CHECK** Read the application activity log from the beginning of the operation.
- CHECK** Open the imported screen and inspect all visible objects.
- CHECK** Verify tags, alarms, events, navigation actions and security settings.
- CHECK** Compile the HMI device and resolve all relevant errors and warnings.
- CHECK** Test the screen in simulation before downloading to a physical panel.

NO AUTOMATIC DOWNLOAD

Besenix HMI Screen Manager changes the offline engineering project. Downloading, commissioning and machine-safety validation remain separate TIA Portal tasks.

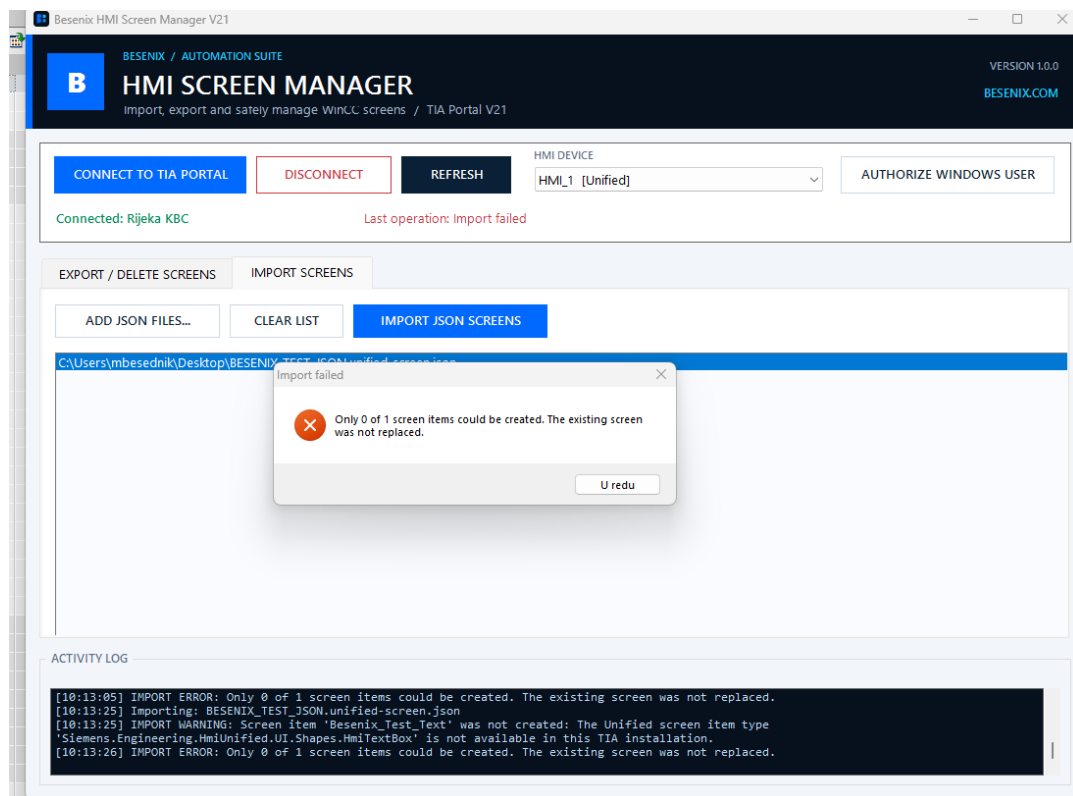
File and data protection

Store exports and backups in a controlled project folder. Do not upload customer projects, credentials, production recipes, network addresses or other confidential engineering data to an external AI service without authorization. Follow the customer's cybersecurity and data-handling rules.

Troubleshooting

MESSAGE OR SYMPTOM	LIKELY CAUSE	RECOMMENDED ACTION
TIA Portal Openness V21 was not found	Openness Public API is not installed or not detected.	Run TIA Portal V21 Setup, choose Modify, enable TIA Portal Openness and retry.
Connection failed or access denied	The Windows user is not authorized or Windows has not been restarted.	Click AUTHORIZE WINDOWS USER, approve the administrator prompt and restart Windows.
TIA Portal is not running	No active V21 instance is available.	Start TIA Portal V21 and open the required project before connecting.
No project is open	TIA Portal is running without a loaded project.	Open and save the project, then connect again.
No HMI device was found	The project has no supported HMI software object or the device is not loaded.	Confirm the project and HMI device in TIA Portal, then click REFRESH.
Wrong import file type	XML was selected for Unified or JSON for Classic.	Use XML with [Classic] and .unified-screen.json with [Unified].
Unified screen item type is not available	The JSON references a type unavailable in this TIA installation.	Use a snapshot exported from the same environment or replace the object with a supported type.
Only part of a Unified screen was created	Some objects, properties or actions could not be reconstructed.	Read IMPORT WARNING entries, inspect the temporary result and simplify unsupported content.
Existing screen was not replaced	Temporary Unified reconstruction failed before replacement.	The original screen is preserved. Correct the reported issue and import again.
Delete is disabled	A Unified HMI device is selected.	Safe delete is intentionally available only for Classic screens.
Static package cannot be selected	The file is not a valid ZIP package or manifest.json is missing from the archive root.	Rebuild the package with the required root manifest and listed XML files.
Package targets another family or TIA version	TargetFamily is not Classic or TiaVersion is not V21.	Use a package explicitly prepared for Classic WinCC and TIA Portal V21.
IMPORT STATIC PACKAGE is disabled	No validated package is loaded or the selected HMI is Unified.	Select a Classic device, choose the package and complete validation first.
Graphic or screen import failed	An XML file is incompatible, locked or conflicts with target project content.	Read the activity log, close open editors, verify the source version and retry in a project copy.

Unified import protection example



Actual Unified import failure. The original destination screen was preserved because reconstruction did not succeed.

SUPPORT INFORMATION

When requesting support, include the application version, Windows version, TIA Portal version, HMI family and the relevant activity-log message. Remove confidential project information first.

Quick reference and support

CONTROL	PURPOSE
CONNECT TO TIA PORTAL	Attach to the first available open TIA Portal V21 project.
DISCONNECT	Close the Openness connection and clear loaded project data.
REFRESH	Reload HMI devices and the selected device's screen list.
AUTHORIZE WINDOWS USER	Add the current account to the Siemens TIA Openness group after administrator approval.
SELECT ALL / CLEAR SELECTION	Manage the current screen selection.
EXPORT SELECTED / EXPORT JSON	Export Classic XML files or Unified JSON snapshots.
DELETE SELECTED	Back up and delete selected Classic screens. Disabled for Unified.
ADD XML FILES / ADD JSON FILES	Add compatible files to the import list.
IMPORT XML SCREENS / IMPORT JSON SCREENS	Import screens into the selected HMI device.
SELECT PACKAGE	Choose a Besenix Static HMI Screen Package ZIP file.
VALIDATE	Recheck package metadata, paths and listed Classic screen XML files.
IMPORT STATIC PACKAGE	Import listed Project Graphics first and then the Classic screen XML. Available for validated packages and Classic devices only.

WEBSITE

<https://besenix.com>

SUPPORT

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Document information

Product: Besenix HMI Screen Manager V21

Software version: 1.1.1

Document edition: 1.1 - September 2026

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Version 1.1.1 release information

Version 1.1.1 is a maintenance release for the Static Screen Package interface. Core import, export and safety behavior remains unchanged from version 1.1.0.

Fixed in version 1.1.1

- CHECK** The IMPORT STATIC PACKAGE button is no longer positioned outside the visible tab area on affected Windows display and DPI configurations.
- CHECK** The import button is placed directly to the right of VALIDATE and uses a stable top-left anchor.

Unchanged workflows

- CHECK** Classic XML screen import, export and safe deletion with automatic backup.
- CHECK** SIMATIC Unified JSON engineering snapshot import and export.
- CHECK** Static package validation and TIA Portal V21 Project Graphics import.
- CHECK** TIA Portal Openness authorization through AUTHORIZE WINDOWS USER.
- CHECK** No automatic project save, compilation or download to the PLC or HMI panel.

RECOMMENDED UPGRADE

Use version 1.1.1 for all new installations, especially on systems where display scaling previously hid the static package import button.

Official resources

Website: <https://besenix.com>

Product demonstration: <https://www.youtube.com/watch?v=nvIUfQj2sE>

Support: hello@besenix.com