FrontFace

Digital Signage & Kiosk Software

User Manual

Version 4.7.3

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I Introduction

1 Introduction

FrontFace is a very powerful and flexible digital signage & kiosk software that allows you to easily present any kind of content such as images, videos, Web pages, text and even printed documents (e-paper) on public displays, digital signage appliances and also on interactive touchscreen kiosk terminals. It is the perfect solution for both classical digital signage applications as well as interactive kiosk systems or a combination of both interactive and non-interactive components.

FrontFace comes with a lot of powerful features such as comprehensive content scheduling, live content updates while the player application is running, network, offline and cloud replication (for deploying content over the Internet), multi-screen support and much more! In contrast to many other digital signage products, *FrontFace* is not Cloud-based/SaaS (Software as a Service) and can therefore be operated independently and privately at your site without requiring any online services or backend servers that produce running costs or privacy issues.

FrontFace was developed with these main objectives in mind:

- Creating a **highly intuitive and easy-to-use/easy-to-install** application with a steep learning curve, also suitable for users with little technical background.
- Providing a **very powerful and feature-rich application** in order to support a board range of use cases and applications.
- Being **open for extensions and customization** to be able to even cover very individual or exotic use cases.
- Guaranteeing **a maximum of stability and reliability**.

To sum it up: "*FrontFace* is an easy to install, easy to learn and easy to handle system that is yet very powerful and does not limit the scope of possible applications and use cases!"

How to get started?
Visit the FrontFace Website for some Quickstart Video Tutorials or follow the Step-by-Step Quickstart Tutorials 9 from this manual in order to get started. In addition to that, there are also sample projects included in installation package you can use as a starting point. To open the sample projects, the video tutorials, the *FrontFace* Website or this manual simply use the links provided on the "**Home**" menu item of the ***FrontFace Assistant*** that appears right after you start the application!

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1.1 Quickstart Installation Tutorial

In order to get started quickly with *FrontFace*, simply follow this quickstart tutorial that covers the installation of the different components of the *FrontFace* system. In the section followed by these installation tutorials, you find some use case-centric tutorials 12 that help you getting started with your specific use case in mind.

For more information about the system architecture of *FrontFace* and its components, please also take a look at the Overview 21 section of this manual.

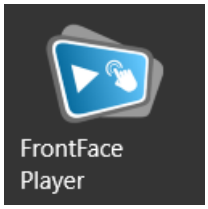
FrontFace consists of two main components: The ***FrontFace Assistant*** which is an application to create, edit and mange your content and players while the ***FrontFace Player App*** is the software that actually runs your content on the user-facing devices such as large screens or touch screen terminals.

Why not lean back and watch a movie?
The installation of the *FrontFace* software and also a brief overview/introduction on how to actually use the software is available as video tutorial on our Website. We highly recommend to take few minutes to watch these short videos. This is the best way to get a quick start!

The setup package (also called "installer") contains everything you need to install *FrontFace*. If you have downloaded the free trial version, the setup file is **`frontface-trial.exe`**; if you have obtained the full version, it is **`frontface.exe`**. You can install the full version "over" the trial version to turn a test installation into a production installation (see License Activation 36 for details).

1.1.1 Installation of the FrontFace Player App

If you just want to try out *FrontFace* and do not have a dedicated player PC where to install the ***FrontFace Player App***, please skip this step and start with the **Installation of the FrontFace Assistant** 10 that allows you to try out the software on your normal desktop PC or laptop.



The ***FrontFace Player App*** is normally installed on a dedicated PC which is connected to a large screen or TV or a touchscreen (for interactive systems). This PC is also referred to as **"Player PC"** or just **"Player"**. Fore more interactive use cases, often so called kiosk terminals are used which represent a ruggedized All-In-One (AIO) PC system with touchscreen. These kiosk terminals are also referred to as "Players". Regarding the supported operating systems and hardware requirements for player PCs, please see the System Requirements 15 section.

If you only want to try out *FrontFace* and have no separate player PC, you can also skip this step since the installation of the *FrontFace Assistant* contains everything you need to get started with *FrontFace*. However, if you want to do a realistic setup with a dedicated player PC, please execute the *FrontFace* setup package on the player PC.

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Please select the installation type "**Only Player Installation**" to only install the runtime component that is needed to play your content. The *FrontFace Assistant* will not be installed in this case since all the content creation and publishing will be done remotely from your regular desktop PC where the *FrontFace Assistant* is installed.

During the installation process, you can select an option to automatically create a network share for the so called "**Publishing Folder**". This is a folder in the file system of the player PC that serves as end-point for the *FrontFace Assistant* to communicate with the player and to deploy new and updated content remotely. If your player PC and your PC with the *FrontFace Assistant* are both on the same, local network, you should keep this option enabled. However, there are also other publishing methods available (such as Internet-based or offline; please see Publishing Methods 50 for details). Please see the section Maintenance Menu 27 in case you want to relocate the Publishing Folder to another location.

Depending on the network configuration of your player PC, you might have to enable accessing network shares on this PC from external PCs in the Windows settings. Please see section Windows Network Configuration 170 for details.

If you want to automate the start of the *FrontFace Player App* and the login to the player PC, you can use the FrontFace Lockdown Tool 160 to configure your PC with minimum effort. In addition to that you should also take general security aspects 182 into consideration.

A link to detailed **step-by-step instructions for setting up the player PC** can also be found in the Windows Start menu under "**FrontFace**" > "**Player Setup**". Alternatively, these instructions can also be displayed after completing the player setup wizard.

Once you started the *FrontFace Player App* (e.g. from the Windows start menu), you see a black screen and a notice telling you that no content has been published so far.

You can now head back to the PC with *FrontFace Assistant* installed on it and start creating your first project and publish your content to the player PC.

1.1.2 Installation of the FrontFace Assistant

The ***FrontFace Assistant*** is usually installed on a normal desktop PC or notebook PC. Simply run the setup package and select the installation type "**Full Installation**". This will install the ***FrontFace Assistant*** as well as the ***FrontFace Player App*** which is also required to preview your content.

The installer presents various options to you which you can all leave as they are at this point.

Once the installation has finished, start the ***FrontFace Assistant*** from the Windows start menu. You can also tick a check box in the installation wizard to start the ***FrontFace Assistant*** right after the installation has finished. After the application has loaded, you see the "**Home**" menu item from where you can start by creating a new project or loading an existing project.

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A ***FrontFace*** **project** 41 covers the entire configuration as well as the content of your digital signage application or kiosk system. Since a project consists of several files and (sub)folders, we often refer to the **"Project Folder"** when talking about the location in the file system, where the project is stored.

To learn how to use the *FrontFace Assistant*, either see one of the Quickstart Tutorials for Use Cases 12 or see the section of this manual that deals with the *FrontFace Assistant* 39.

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1.2 Quickstart Tutorials for Use Cases

Getting started with *FrontFace* is really easy. However, there are so many different things you can do with *FrontFace* that just one sample project does not fit. Therefore, we have created several quickstart tutorials and sample projects that cover different use cases. Just pick the one that comes closest to your intended use case to get started!

1.2.1 Personalized Welcome Board

A **welcome screen** or **welcome board** is a common digital signage application. By displaying a personalized welcome message (e.g. *"Welcome to our company, Mr. Miller!"*) on the screen in the lobby or reception area, you create a friendly and welcoming atmosphere for visitors, guests and business partners.

Take a look at the sample project "Welcome Screen" included with *FrontFace* or create your own welcome board with the help of our quick start tutorial: ***"Welcome Boards with FrontFace: Learn how to build your own, personalized reception screen for visitors!"*** (PDF Download)

1.2.2 Room Occupancy Plans and Schedules

Current appointments, room occupancy or schedules for events - **displaying calendar data on digital signage screens** is a typical and frequently required functionality. In combination with the Calendar Plugin, you can easily integrate calendar data from data sources such as Excel spreadsheets, Microsoft Exchange Server (Outlook), Lotus Domino (Notes) or iCalendar (ICS).

Learn in our quick start tutorial ***"Displaying Calendar Data with FrontFace: How to bring appointments, schedules and room occupancy plans to your screen!"*** (PDF download) how to integrate calendar data with the help of the Calendar Plugin in *FrontFace*.

1.2.3 Business Digital Advertising

Business Digital Advertising such as digital shop window advertising is one of the most popular use cases for digital signage. You can display offers and information about your products on a digital screen which creates more visibility and attention than traditional, printed posters and is also much easier and cheaper to update.

The sample project shows some typical use cases for business digital advertising such as shop window advertising for real estate brokers, pharmacies or retail stores. The sample project also includes a digital menu board for restaurants and cafeterias that is made up with Print2Screen 134-generated content that has initially been built using *PowerPoint*.

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1.2.4 Digital Billboard

A **digital billboard** or **blackboard** is great for schools and universities but also for companies as an employee information system. The sample project that comes with *FrontFace* demonstrates how to create digital blackboard using some of the included layouts 82 that come with *FrontFace*. You can see how a blackboard can look like that resembles the look and feel of a traditional pin board or a modern information screen.

In addition to that, the sample project also includes a trial version of the **Dashboard Plugin** which can display figures and status information in a visually appealing way. For more information on the Dashboard plugin, please click on the container with the plugin and then, in the settings dialog of the plugin, click on the **"Manual"** hyperlink to open the PDF manual of the Dashboard plugin.

Learn how to easily create a digital bulletin board with *FrontFace* in our quick start tutorial ***"Learn how to easily set up an (Interactive) Digital Bulletin Board with FrontFace!"*** *(PDF download)* (both interactive and non-interactive variants!).

1.2.5 Interactive Information System

An **interactive information system** allows users such as employees or visitors to interactively access any kind of multimedia information that you want to provide. The sample project shows an exemplary employee information system where workers can get the latest information about their company. The core element is a touch menu 73 that provides an hierarchical menu with an easy to understand navigation structure.

One of the more sophisticated features is the use of password-protected content: Instead of a static password (the password in this sample project is "`password123`"), it is also possible to integrate devices such as RFID readers or bar code scanners to grant only selected users access to specific information.

For more details on the protection feature, please see the section Protected Content 155.

Take a look at the sample project "Interactive Information System" included with *FrontFace* or create your own interactive multimedia information system for touch screens with the help of our quick start tutorial: ***"How to create an Interactive Multimedia Information System for Touch Screens!"*** (PDF Download)

1.2.6 Tourist Information Terminal

Tourist information terminals are a common use cases for interactive kiosk system found in hotels or tourist sights. Tourists can use the terminal to get information about sights and interesting activities. It can also serve as Web surfing kiosk.

The core element is a touch menu 73 that provides an hierarchical menu with an easy to understand navigation structure.

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II System Requirements

2 System Requirements

2.1 Windows

FrontFace can be installed and used on all PC's that run a Microsoft Windows 10/11 operating system.

Supported Operating Systems:

- Windows 10 Home*, Pro or (IoT) Enterprise (32 and 64 Bit)
- Windows 11 Home*, Pro or (IoT) Enterprise (32 and 64 Bit)
- macOS (only when used with Parallels**)

*) Basically, *FrontFace* can also be run on the Home version of Windows, but especially as an operating system for the *FrontFace Player App*, this version is only recommended to a limited extent, since many settings and configuration options are disabled or restricted. Therefore, use the Pro or Enterprise version of Windows if possible.
**) When running Parallels with Windows 11 ARM, "Print2Screen" is not available!

System Requirements:

- Microsoft .NET Framework 4.8 (is installed automatically by the setup wizard if required!)
- For Video Content: Windows Media Player 10 or higher (Windows Media Foundation) or LAV Filters Codec Pack 165 (recommended)
- For Proxy Servers: If you use a proxy server to access the Internet (either by the *Player App* or by the *FrontFace Assistant*) the Web proxy has to be configured properly as described in the section Proxy Server Configuration 166!

Hardware Requirements:

- **PC System:**
  - There are no minimum hardware requirements for this software. In order to achieve a good performance it is recommended to use a decent graphics card (e.g. NVIDIA or ATI). Generally the required hardware highly depends on the indented use case of the software (e.g. whether multimedia features such as videos and graphical transition effects are being used or if only static content is supposed to be shown).
  - The player PC should have at least 1 GB of RAM. However 2 GB of RAM is recommended for a robust setup.
  - If you use a PC with an *intel* onboard graphics unit, please make sure that your *iCore* board/processor is at least the 6th generation or higher and that it has DDR4 RAM installed.
- **Screen(s):**
  - All screen resolutions and orientations (landscape/portrait) are fully supported, incl. Full HD and 4K as well as special form factors.
  - You can control multiple screens, also showing different content, with a single player unit.
  - If you plan use interactive features (e.g. touch menus), we recommend a **touchscreen** (however, mouse & keyboard are also fully supported as input methods!). Both multi-touch as well as single-touch screens are supported (the latter one with some restrictions in regards to multi-touch gestures!)

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For automated/scripted installation, please see Software Deployment and Updates 163.

Important information regarding the use of EWF (Enhanced Write Filter) / Unified Write Filter (UWF) of Windows Embedded and Windows 10/11 IoT:

In case you are using one of the embedded / IoT versions of Windows, please make sure that the Enhanced Write Filter (EWF) / Unified Write Filter (UWF) is deactivated while installing *FrontFace*. You also have to relocate the *Content Cache Folder* and the *Publishing Folder* to a location which is not protected by the EWF/UWF. After applying this modification *FrontFace* is fully compatible with EWF/UWF. So once you have installed and configured *FrontFace*, you can reactivate EWF/UWF again. Please note that a so called "Commit" has to be performed in order to persist the changes!

Special Notice When Using Antivirus Software:

In case you are using an antivirus software either on your player PCs or on the PC where you run the *FrontFace Assistant*, make sure that you exclude some specific folders in order to prevent problems with false positives and corrupted *FrontFace* projects. The following folder should be excluded/white listed by your antivirus software:

On the player PC:

- Publishing Folder (Default: `"C:\ProgramData\mirabyte\FrontFace\Publish"`)
- Content Cache Folder (Default: `"C:\ProgramData\mirabyte\FrontFace\Cache"`)
- Temporary Files Folder (Default: `"C:\ProgramData\mirabyte\FrontFace\Temp"`)

On the PC with the *FrontFace Assistant*:

- Project Folder (the location where you store your project)
- Temporary Files Folder (Default: `"C:\ProgramData\mirabyte\FrontFace\Temp"`)

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2.2 Android

In addition to the *FrontFace Player App* for Windows, there is also a FrontFace Player App for Android 31 available.

The Player App for Android has some functional limitations compared to the Windows version. The Android version is primarily intended for simpler and smaller applications. For applications that require the full capabilities of *FrontFace*, the Windows version 27 is recommended. One of the most important differences is that the Android version currently does not support interaction (Touch Menus 73). Therefore, only Digital Signage Playlists 67 are supported. A detailed overview of the differences can be found on the *FrontFace* product homepage.

Supported Device Classes:

- Android phones and handhelds
- Android tablets
- Android TV (with integrated or separate media player)
- Android Mini PCs and Media Boxes
- Amazon Fire TV

Notice: Due to the very heterogeneous range of Android devices with a wide variety of features and software that has been largely customized by the manufacturers, a prior, comprehensive test of the intended hardware for the respective use case is highly recommended!

Supported Android Versions:

- Minimum version: Android 7.1 ("Nougat", API level 25)
- Maximum version: Android 12.1 (API level 32)

Hardware requirements:

- Depending on the storage equipment of the device, it may be necessary to increase the memory via SD card or USB stick in order to be able to also run content such as large videos.
- A hardware keyboard (USB) is highly recommended for the initial setup, especially on Android TV devices that only come with a normal remote control.

Supported Publishing Methods:

- Offline Media 57 (USB Thumb Drive or SD card)
- File Server 53 (Local Network) *
- Cloud Storage Service 55 (Internet) **
- Web Server 54 (Internet) ***

*) A SMB/Samba-capable network storage is required. This can be a NAS (Network Attached Storage) or a conventional file server.

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**) To enable publication via the cloud, an appropriate app must be installed on the Android player device (e.g. Dropbox), which is able to synchronize content automatically in the background.
***) For publishing via a Web server you need a Web server that supports uploading by FTP(S)/SFTP.

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2.3 Firewall Settings

If you are using a **firewall** (either locally on the PC or a hardware firewall), you may need to adjust it for FrontFace to operate correctly.

Normally, when publishing to 130 the Player PC, the data transfer takes place via the file system. If a network share 52 is used, you must ensure that SMB traffic can pass through. In most environments, this is already possible without any further adjustments to the firewall.

However, FrontFace may also need access to the Internet. The following areas can be distinguished:

1.) Access to RSS news feeds, video streams and weather data.
2.) Access of the integrated web browser to the WWW or intranet
3.) Access to a web server (in case of using the Web Publishing 54 method)

The following processes may access the Internet and therefore need to be whitelisted in the firewall:

```
C:\Programs\mirabyte\FrontFace\FrontFace Runtime.exe
C:\Programs\mirabyte\FrontFace\FrontFace Assistant.exe
C:\ProgramData\mirabyte\FrontFace\Temp\Chromium\Bin\WindowsX64\chromium.exe
```

During installation 24, you can specify in the Setup Wizard whether corresponding exception rules for the *Windows Firewall* should be created automatically.

If you also use a proxy server 166 to access the Internet, you may also need to make appropriate adjustments here.

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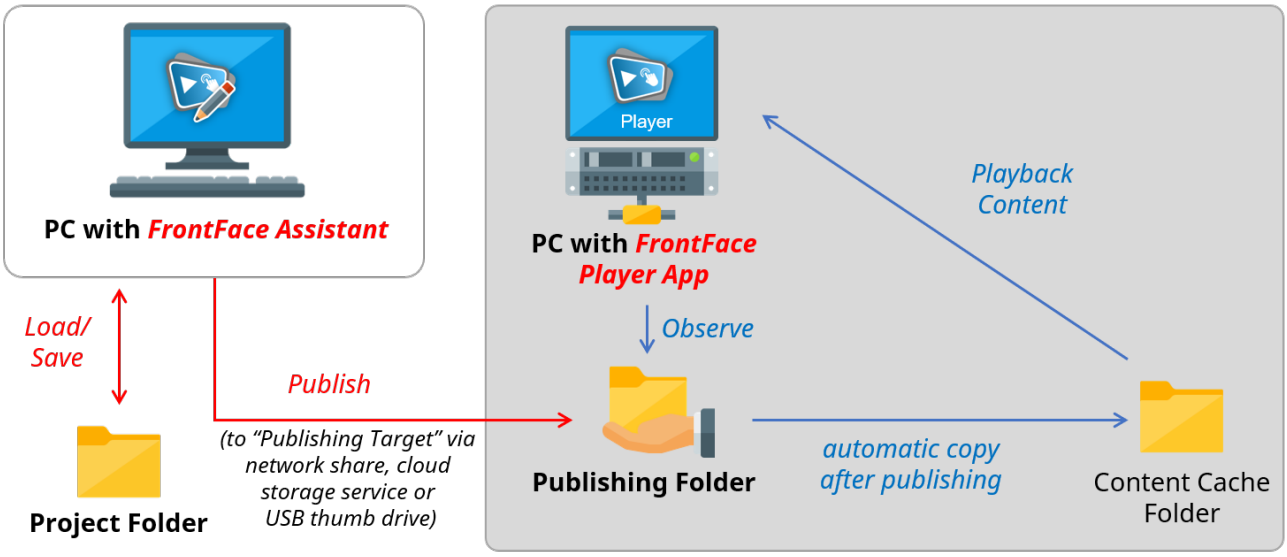
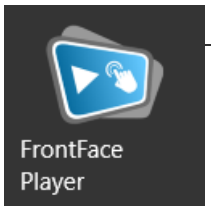
III Overview & System Architecture

3 Overview & System Architecture

FrontFace is a very flexible digital signage and kiosk software system than can be used for many use cases and which works well in various different technical contexts.

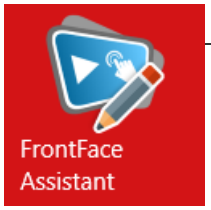


The *FrontFace* system consists of two main components:



FrontFace Player App:

The *FrontFace Player App* runs on a player PC or kiosk terminal PC. This is the PC that is hooked to a large screen or touchscreen. It displays the content and allows the interaction with the end-user (for kiosk applications). The content is updated remotely from a different PC using a shared network folder on the player PC or a separate server. Alternatively, content can also be updated over the Internet or by using an offline medium such as a USB thumb drive (see section Publishing Methods 50). The *Player App* always monitors the **"Publishing Folder"** for new, updated content published by the *Assistant*.



FrontFace Assistant:

The *FrontFace Assistant* is the "content management system" (CMS) which can be installed on any normal desktop or laptop PC to create, edit and update the content that is displayed by the *FrontFace Player App* on the player/kiosk PC. You have to configure the **"Publishing Target"** folder to which the content is deployed to and from where the *FrontFace Player App* picks up the updated content automatically. The **"Publishing Target"** points to the same location as the **"Publishing Folder"** as configured in the *Player App*.

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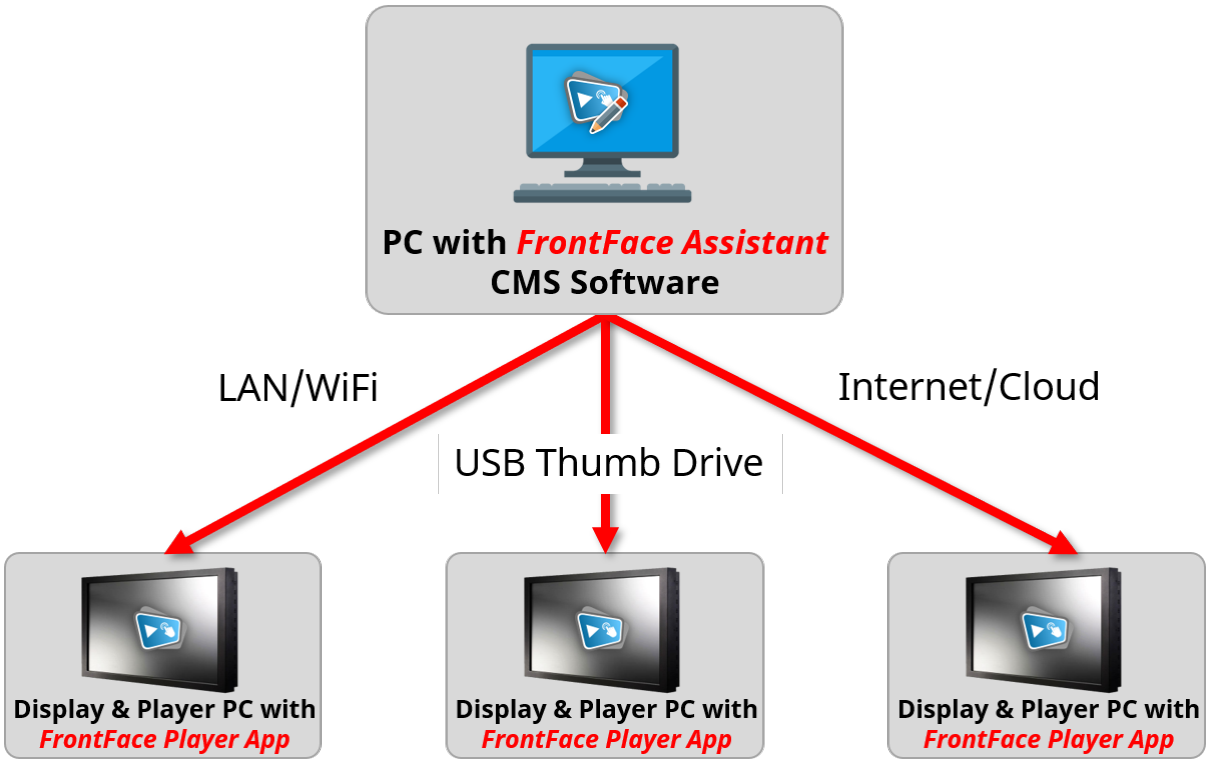

The system architecture is kept super-simple to allow an easy and non-intrusive integration into any existing infrastructure. You do not need a dedicated server or any external component (such as a Cloud service) to run *FrontFace*. It can easily be installed in any existing network without having to modify firewall rules and it works fully "on-premises" for maximum independence and privacy.

Since both player PC(s) as well as the PC(s) where the *FrontFace Assistant* is installed on are normal, Windows-based computers, there is no exotic hardware required that might interfere with your exiting infrastructure or cause potential security problems. You can manage player PCs in the same way as your normal workstation PCs in regards to security, software deployment, Windows updates and other managed features.

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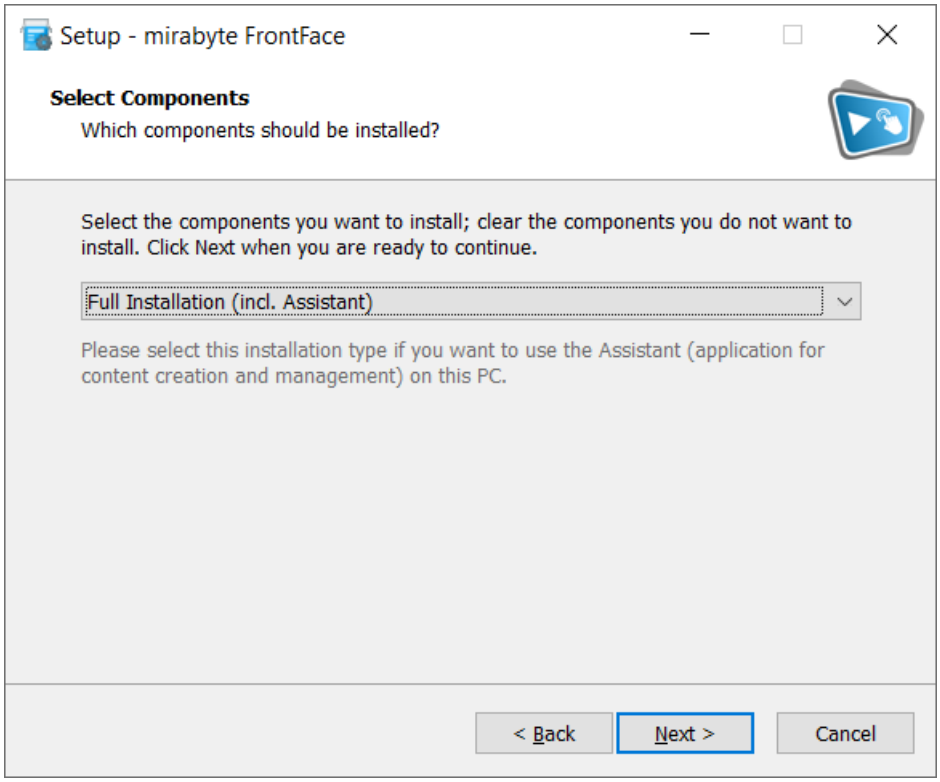
IV Installation Options

4 Installation Options

During the installation process, you can select different installation options. There are three installation types you can select from:

- **Full installation (incl. Assistant)**
- **Install Player App only (for installation on a player PC)**
- **Custom Installation**



In all cases, the *FrontFace Player App* will be installed because it is also used internally to run the preview 125 feature of the *FrontFace Assistant*. Therefore, there is no "**Install only FrontFace Assistant Option**".

If you want to install *FrontFace* on a player PC that is not used for editing your content (which is the default case), simply select "**Install Player App only (for installation on a player PC)**".

During the installation process, you can choose to automatically create a network share for the *Publishing Folder*. This is the recommended setting if you plan to use the "**Directly to Player (Local Network)**" publishing method 50 to remotely update your player.

To configure the automatic start of the *Player App* on a player PC when booting Windows, we recommend to use the included *FrontFace Lockdown Tool* 160 after the installation of the *Player App*.

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Notice: In addition to the interactive installation, there is also the option of an unattended installation 163, which is controlled via the command line. This type of installation is primarily intended for the automated installation of updates.

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V FrontFace Player App

5 FrontFace Player App

5.1 Player App for Windows

You can exit the Player App by hitting the **ESC** key or by clicking or touching into the **lower left corner** of the screen and then in the **lower right corner** of the screen. If you have configured a PIN code in the player settings 61, you first need to enter that code before you can exit the Player App, access the maintenance menu of the player or to return to Windows.

The *FrontFace Player App* should normally start automatically when you boot the player PC. You can conveniently configure autostart, including automatic login to Windows, and other settings for unattended continuous operation with the included *FrontFace Lockdown Tool* 160.

5.1.1 Maintenance Menu

The *FrontFace Player App* has a special **maintenance menu** that you can access if you need to make modifications to the local player configuration 28 or if you need to access the underlying operating system.

In order to access the maintenance menu, press **ESC** or, on a touch screen system, first tap in the lower left corner of the screen and then in the lower right corner.

In the maintenance menu, you can shutdown, restart or exit the system, (re)start the player, modify the local player settings 28, open up the *FrontFace Lockdown Tool* 160, view the player log 30 file or show the bounds of the screen(s). This option is very helpful when calibrating displays and adjusting over/underscan issues on screens that are connected via HDMI or DisplayPort.

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5.1.1.1 Player Settings

Most of the player-specific configuration options can be set in the "Player Settings" list 61 in the "**Players**" menu item of the *FrontFace Assistant*. In order to make the list with the available settings visible, you have to click on "**Show Advanced Player Settings...**".

In some cases it can be required that you need to make modifications to some configuration options of the *Player App* that cannot be set remotely using the player settings defined in the *FrontFace Assistant*. An example for such a setting that cannot be changed remotely is the path to the **Publishing Folder** where the *Player App* looks for updated content that is published by the *Assistant*.

If you need to make changes to the local player settings, press **ESC** while the *Player App* is running to access the maintenance menu and then click on the " " button in the lower right corner of the screen for the maintenance options. Select "**Player Settings**" to open the configuration dialog for settings that can only be set locally on the player.

Here you can specify, among other things, the publishing method used (and thus also the publishing folder).

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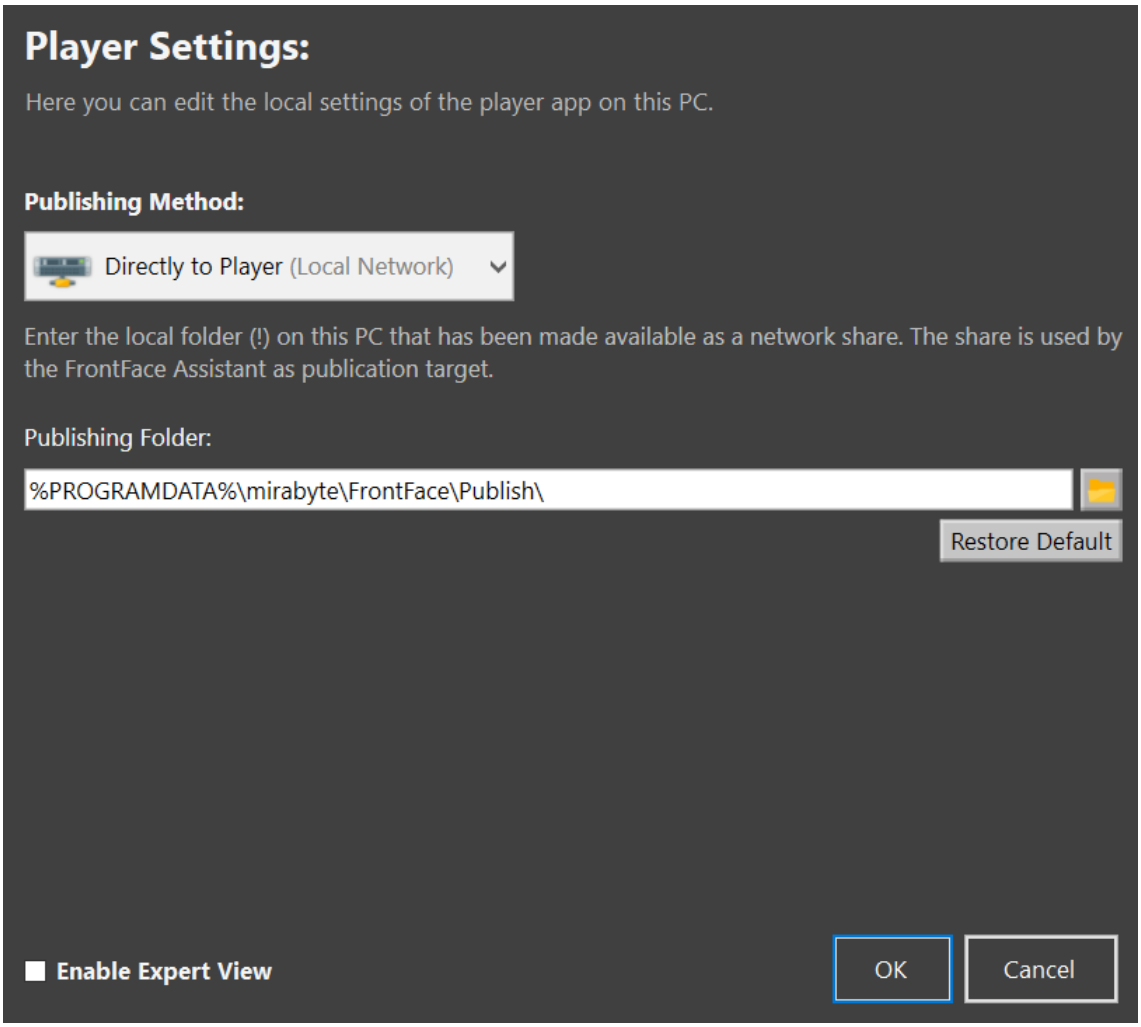
If the **"Expert View"** is enabled there are some more settings like e.g. "License Key".

Once you applied any changes, please click **"OK".** Then the *FrontFace Player App* will restart automatically.



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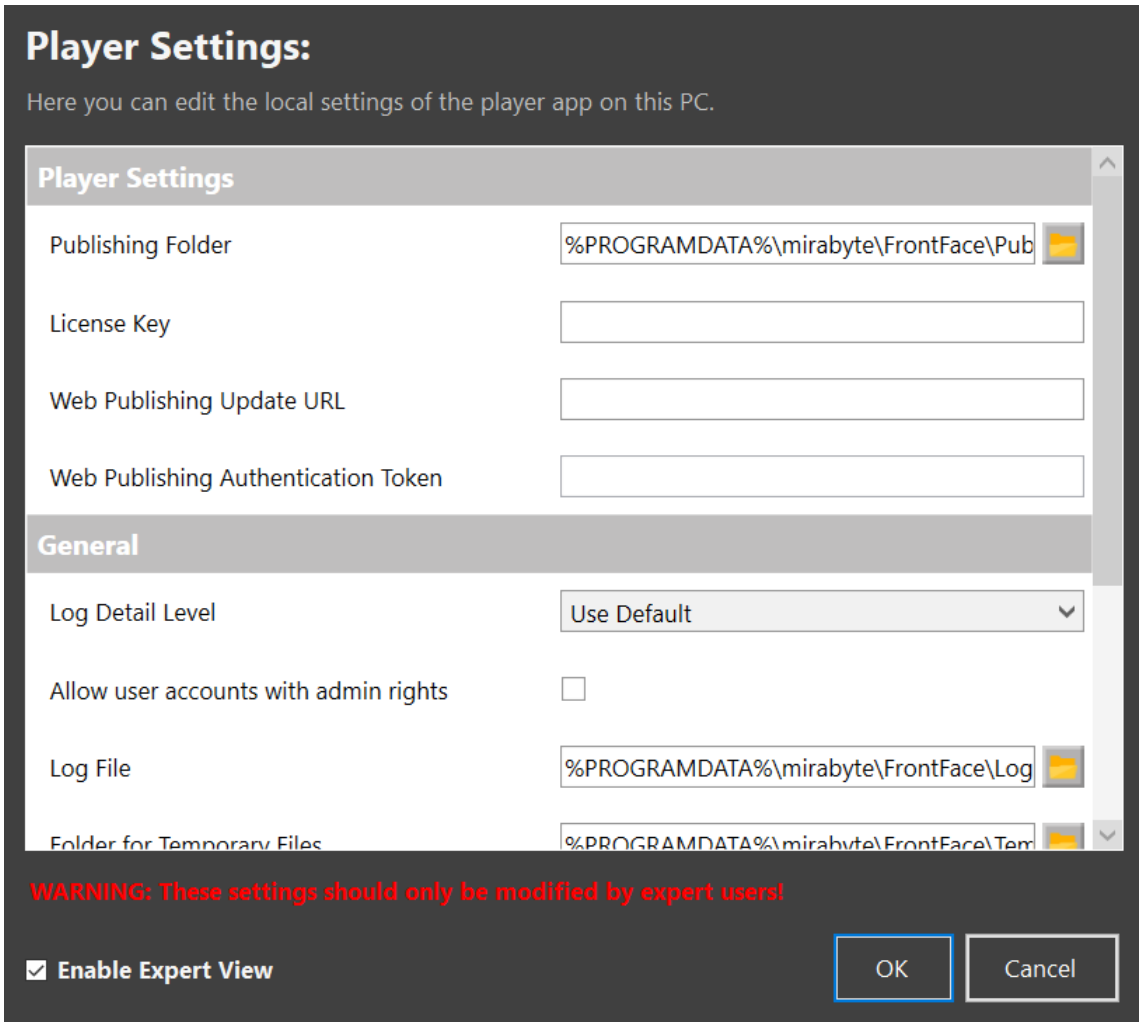

5.1.2 Player Log File

The *FrontFace Player App* writes a log file on the player PC. By default, only warnings and errors are logged to that file. In case of technical problems, the log file may be helpful to identify the reason for the actual problem.

In the Player Settings 61, you can set the log level and the maximum size of the log file in MB. If this size is exceeded, the log file is truncated automatically. In production use it is not recommended to set the log level to a value higher than "**Warning**" to prevent to much verbosity.

The log file is, by default, located here:

```
"C:\ProgramData\mirabyte\FrontFace\Logs\FrontFace Player.log.txt"
```

You can also use the Player Status dialog 63 of the *FrontFace Assistant* to view the log file from remote.

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5.2 Player App for Android

In addition to the *FrontFace Player App* for **Windows**, there is also a *FrontFace Player App* for **Android** available.

The *FrontFace Player App* for Android is NOT available from the *Google Play Store* and needs to be "sideloaded" 31.

The *Player App* for Android has some functional limitations compared to the Windows version. The Android version is primarily intended for simpler and smaller applications. For applications that require the full capabilities of *FrontFace*, the Windows version 27 is recommended. One of the most important differences is that the Android version does not support interaction (touch menus 73). Therefore, only digital signage playlists 67 are supported. A detailed overview of the differences can be found on the *FrontFace* product homepage.

Information: The *FrontFace Player App* for Android is equipped with a special guarding system that prevents other apps to get into the foreground and which can recover the *Player App* automatically in case of technical problems or crashes. Due to this, you cannot exit the *Player App* by clicking on the "**Home**" button of the Android system. Please go to the maintenance menu 34 of the player app and select "**Exit**" to exit the *Player App*.

5.2.1 Installation

In order to use the *FrontFace Player App* for Android, you have to download and install the `FrontFace.apk` installation package on your Android device. *FrontFace* is not available from the *Google Play Store*! Instead you have to "sideload" the APK on the device.

Notice: The **APK installation package** can be downloaded using the PC with the *FrontFace Assistant* installed. Go to the "**Players**" section and select an Android player from the list. On the right side, you see a download button that allows you to download either the trial version or the full version of the *FrontFace Player App* for Android, depending on the license you have purchase.

Preparations:

The first step is to install a file commander app that you can use to browse the file system and to launch the `FrontFace.apk` file. We recommend **FX File Explorer** by NextApp, Inc.

Next, you need to allow this app to install apps form unknown sources (aka "sideloading"). Open the settings menu of Android ("⚙"), select "**Apps**" and pick the file explorer app you want to use. Enable the "**permission to install apps from unknown sources**".

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If you use a device with the Android TV operating system, you should make sure that any existing options for automatically switching off the device after a certain period of time and the screen saver are deactivated.

Installation:

Deploy the **`FrontFace.apk`** to the Android device, e.g. using an SD card or a USB thumb drive. Open the file explorer, select and install the **`FrontFace.apk`**. There might appear some additional warnings including an option to submit the app to *Google Play* for a security check. All these warnings should be ignored or skipped.

First Start:

Once *FrontFace* has been installed, you can start the app by clicking on the corresponding icon in the app list. Upon the first start, you have to grant the file/storage access read/write permission to the *FrontFace Player App*.

Once the app has started, the maintenance menu 34 is shown where initial configuration has to be applied.

Initial Setup:

The content can be published using the *FrontFace Assistant* 39 to the player either via USB thumb drive or via network storage (NAS or file server) or via a cloud storage service. After starting the *Player App* for the first time, you must first select the **Publishing Folder** depending on the publishing method 50 you have chosen:

- **Publishing via USB thumb drive:**
  If you want to publish via USB stick 57, insert the stick with the previously published content by the FrontFace Assistant 57 into your Android device and select the path to the **`"/FF_DATA/"`** directory on the media in the "**Local Folder**" tab. You can usually find the media in the Android file system under **`"/Storage/"`**. On many devices, instead of the name of the media, only a cryptic identifier appears (e.g. **`"10F5-3C1C"`** or similar). After the Player App has been launched for the first time and your content is displayed, the media can be removed. That removable disk can then be used for later content updates simply by plugging it back into the device while the Player App is running.

- **Publishing using a Web Server:**
  A very convenient way to publish your content to the player is using a Web server. The Web server needs to support **FTP(S)** or **SFTP** for uploading the published content with the *FrontFace Assistant*. Simply provide the **http(s) URL** to the published content in the "**Web Server**" tab and the *FrontFace Player App* will automatically check for new/updated content and update itself. It is possible to protect the Web sever using HTTP basic authentication. In this case you can provide an optional user name and a password.

- **Publishing via network storage (NAS or file server) in the local network:**
  If you want to publish via the local network 53, you must first create a **network share** on a **file**

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server or **NAS**. Then select the **host name** or the **host IP**, the **name of the share**, the **user name** and the **password** and optionally the **domain** from the "**SMB Network Share**" tab. If a connection has been established successfully, the content is updated automatically as soon as you publish to the share using the FrontFace Assistant 53. A manual restart of the player app is then not necessary!

- **Publishing over the Internet using a cloud storage service:**
  If you want to publish over the Internet, you must first install the corresponding app of a cloud storage service of your choice on the PC with the *FrontFace Assistant* and on the Android device (for example, Dropbox, OneDrive, OwnCloud, etc.) On the Android device, the synchronized files must then be made available locally or offline in the file system so that the *FrontFace Player App* can access them.
  This "offline files" feature is often only available in a paid version of the app of various cloud storage services (e.g. Dropbox). However, there are free synchronization apps (e.g. "Dropsync - Autosync for Dropbox", which then synchronizes the files with a Dropbox and stores them locally on the device. Pay attention to the synchronization interval (for example every 10 minutes).
  After you have installed the app, define the folder pair: 1. folder in the Dropbox and 2. local folder in the file system of the Android device. Then open the maintenance menu of the *FrontFace Player App* and enter the path to the local folder under "**Publishing Folder**". Finally, start the *FrontFace Player App* and the content published into the share using the FrontFace Assistant 55 will be displayed (depending on the update interval set). A manual restart of the player app is then not necessary!

The **Content Cache Folder** is preset to a location in the local memory of the Android device by default. If your device has very little memory available or you want to publish very large content (such as videos), you may have to move the directory to another location where more space is available (e.g. an external hard drive). In most cases, however, you do not need to change the content cache directory.

Finally, you can specify whether the *Player App* should be **started automatically when the device boots up** and whether the **auto recovery function** (automatic recovery in the event of an error) should be activated (recommended).

Finally, click on "**Start Player**" to start the player with the previously defined configuration.

The first time the *Player App* will restart automatically twice in a row.

Notice: When the *FrontFace Player App* is running, you cannot exit the app by pressing the "**Home**" button. Instead, you need to return to the maintenance menu 34 and press "**Exit**" to quit the *Player App*.

To do so, press **UP, UP, DOWN, DOWN** on the D-Pad of the remote control or, on a system with a touch screen, you can click/touch into the **lower left** corner of the screen and then in the **lower right** corner of the screen.

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5.2.2 Maintenance Menu

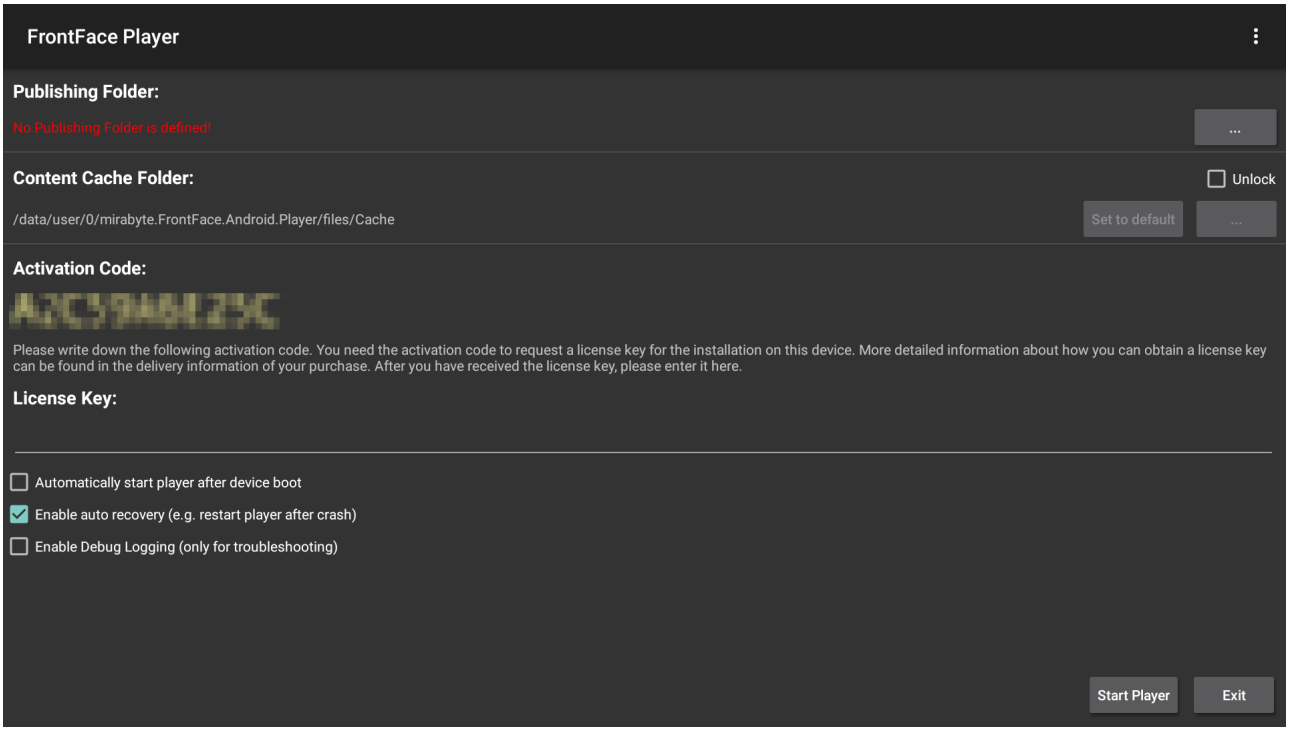
In the **maintenance menu**, the *FrontFace Player App* for Android is initially set up for operation 31 and allows subsequent changes to the configuration as well as the termination of the application.

When starting the *FrontFace Player App* for Android, you can, as long as the splash screen with the *FrontFace* logo is displayed, tap on the ••• button or press **OK** on the remote control (for Android TV) to reach the **maintenance menu**. When you start *FrontFace* for the first time or the setup has not yet been completed, you will automatically be taken to the maintenance menu.

If the *FrontFace Player App* for Android has been fully set up, it starts automatically.

Notice: When the *FrontFace Player App* is running, you cannot exit the app by pressing the **"Home"** button. Instead, you need to return to the maintenance menu 34 and press **"Exit"** to quit the *Player App*.

To do so, press **UP, UP, DOWN, DOWN** on the D-Pad of the remote control or, on a system with a touch screen, you can click/touch into the **lower left** corner of the screen and then in the **lower right** corner of the screen..



The following settings are available in the maintenance menu:

1.) Selection of the *Publishing Folder* (either locally on the device or a remote network share)
2.) Selection of the *Content Cache Folder* (in most cases, there is no need to change this setting!)
2.) Enable/Disable the automatic start of the *Player App* when the device boots*

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3.) Enable/Disable the auto recovery feature

*) On Android devices with Android 10 or higher, it may take a few seconds (up to 30) after starting the device for *FrontFace* to start automatically. During this time, the home screen or the TV launcher is displayed.

In the maintenance menu, you can use the **"Start Player"** button to restart the player app, or you can use the **"Exit"** button to close the application and return to the Android operating system/launcher. If you have selected a removable storage medium as the publication folder, you can also select the **"Update Content from USB / SD"** button to initiate an update, e.g. from a USB thumb drive.

The following functions can be carried out in the maintenance menu:

1.) Starting the Player App
2.) Terminating the Player App (return to the Android Launcher)
3.) Displaying the **Log File** 35 for diagnostic purposes (click on the "⋮" button in the upper, right corner of the screen)

If you have installed a full version of the *Player App*, you can also activate it in the maintenance menu using the activation code displayed 36.

5.2.2.1 Player Log File

The *FrontFace Player App* maintains a log file for diagnostic purposes. In case of any technical problems, further information that may help to resolve the problems, can be found in the log file.

In the Player Settings 61, you can set the log level and the maximum size of the log file in MB. If this size is exceeded, the log file is truncated automatically. In production use it is not recommended to set the log level to a value higher than **"Warning"** to prevent to much verbosity.

The log file of the player can be accessed in two different ways: In the maintenance menu, you can click in the "⋮" button in the upper, right corner of the screen to view the log file. Alternatively, you can access the log file from within the file system of the Android device. The path of the log file is:

Local Storage: **`"/Android/data/mirabyte.FrontFace.Android.Player/files/log/FrontFace Player.log.txt"`**

Please note that the exact path may vary, depending on the device you are using.

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5.3 License Activation

Important: After you have purchased a license of *FrontFace*, you need to activate the software with that license. Only the players are licensed. Any installation of the *FrontFace Assistant* (using the "**Full Installation (incl. FrontFace Assistant)**") that is not used as player (except for the All-In-One setup 51) does NOT have to be licensed!

After you obtained a license, you get access to the full version of the *FrontFace* software. You can use the full version installation package to install *FrontFace* both on players and on PCs where you want to use the *FrontFace Assistant*. If you have already installed the demo version of *FrontFace*, simply install the full version "over" the demo version. There is no need to prior uninstall the demo version. All settings of the demo version will remain when installing the full version over the demo version. Please note that only the full version can be activated. It is not possible to activate an installation of the demo version.

Depending on the license type you have chosen, the activation process differs. Either proceed activating a **Hardware-bound License** 36 or a **Portable License (USB Dongle)** 37.

5.3.1 Hardware-bound License

The **Hardware-bound License** is tied to the actual hardware of the player device. Therefore, if you apply any radical changes to the player hardware (e.g. replacing the hard disk, the motherboard or the processor) a previously activated license may fail and needs to be reissued.

When starting the full version of the *FrontFace Player App*, a dialog appears which informs you about the fact, that the installation is not yet activated. In this dialog, an **Activation Code** is shown. This is virtually a "fingerprint" of the hardware of the player. In the **customer account section** of the *mirabyte* homepage, you can issue **license keys** for your purchased licenses. During this process, the activation code of the machine which you are activating is required. Please make sure that you enter the code correctly without any typos. After the license key has been generated in the customer account section, you can enter this license key in the dialog of the *Player App*. After this step, the license key is validated and the *Player App* is restarted. If the license key was accepted, the dialog does not appear any more and the software is activated.

If you need to move a *Hardware-bound License* from one player to another (e.g. due to changing the player hardware or because of a replacement of the device), you have to reissue the license key in the customer account section. A license key always only works for one specific player device and cannot be used on other systems!

If you plan to switch your player hardware quite frequently, we recommend to use a Portable License with USB dongle 37 instead.

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5.3.2 Portable License (USB Dongle)

Portable Licenses come as a physical USB hardware dongle. By plugging the license dongle into the player device, the full version of *FrontFace* on that device is automatically activated. Make sure that you plug in the dongle prior to starting the *FrontFace Player App*! The dongle needs to be present all the time. If the dongle is removed, the installation of *FrontFace* will be deactivated after a few minutes and stop working.

When plugging a license dongle into the player, a new removable drive with it's own drive letter should appear in the *Windows Explorer*. If the drive does not show up, please check using *Windows Disk Management* tool if the drive may need to be mounted manually due to drive letter conflict.

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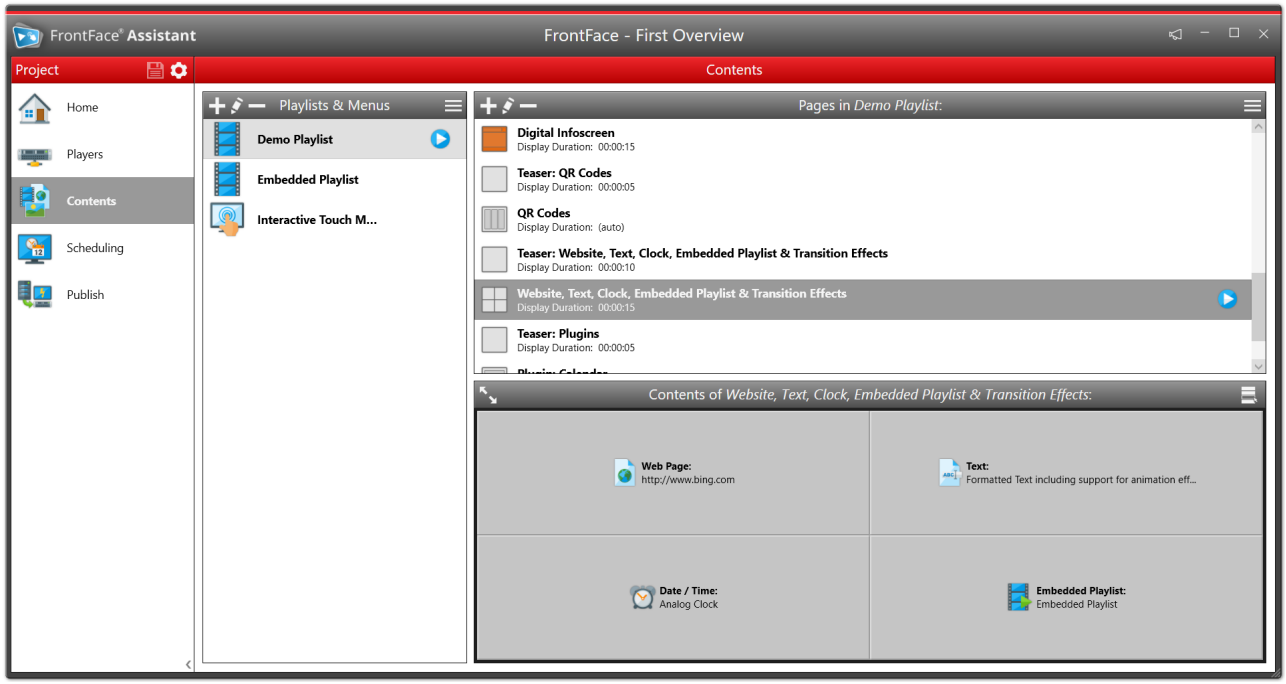
VI FrontFace Assistant

6 FrontFace Assistant

The *FrontFace Assistant* is used to control and manage both the display content as well as the players (remotely). This section explains the basic concepts and the workflow for creating and managing content and screens.

All configuration and content are stored as so called project 41 (**".ffpx"** file extension). A project contains the playlists, touch menus, media files and all configuration information of your player(s). You can also create multiple projects but in most cases you will only need one single project to work with.



FrontFace Assistant with a project opened

The *FrontFace Assistant* application window has four main areas:

- The **Title Bar** that shows the name of the project.
- The **Project Menu** where you can save the currently opened project or access the settings menu 43 and other functions.
- The **Main Menu** that lets you access the different menu items of the application (see below).
- The **Work Area** where the functionality of the menu sections is shown.

The main menu of the *FrontFace Assistant* contains five menu items that provide access to all the relevant features:

- **Home:**
  This is the section that you see first, when you start the *FrontFace Assistant*. Here, you can **create a new project** or **open an existing one**. The home screen also gives you direct access to the recently used projects as well as several help, support and training resources, including this manual.

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The following menu items are only visible if you have opened a project:

- **Users:**
  In case the multi-user support is enabled for a project, you can manage administrators, users and their respective permissions here. If multi-user support is not enabled, this menu section is hidden from the main menu. For more details, see section Users 45.

- **Players:**
  In this section you configure your *player(s)* which are the computers that actually control your display(s). For every player at least one *screen* has to be configured on which the actual content can be shown. It is also possible to create player groups to manage multiple players/screens that are supposed to show the same content more conveniently. For more details, see section Players and Screens 47.

- **Contents:**
  The actual content is organized as so called *playlists* or *touch menus*. A playlist defines a sequence of screen pages that contain single or multiple content elements (called media objects) such as images, videos, Web pages, texts, etc. A touch menu is similar to a playlist but consists of a hierarchical menu of pages instead of a sequence. It is intended for interactive systems. You can also *preview* your playlists and touch menus in this section. For more details, see section Content Management 66.

- **Scheduling:**
  In order to assign playlists or touch menus to the screen(s) of your player(s), you have to define when which playlist/touch menu is supposed to be displayed. Because a player can control multiple screens the content is assigned to the screens of the player(s) using *schedules*. Scheduling has a simple mode where you just select which content is to be shown and a more sophisticated mode where you can define *timers* and *events* that control you content on the screen(s). For more details, see section Scheduling 126.

- **Publish:**
  After you have configured your player(s), content and schedules, the content and all the required configuration data has to be transferred to the player(s). This can be done in the "**Publish**" section of the *Assistant*. For more details, see section "Publishing" 130.

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6.1 Projects

A project contains everything that is related to your individual digital signage or kiosk application. This covers the content (like playlists, touch menus and media files such as videos, images, etc.) but also information about your infrastructure like player(s) and screen(s) as well as scheduling information and user management.

The project consists of several files and folders and in stored in a **"project folder"**. You can choose the location of this folder when you create a project using the *Assistant*. It is possible to relocate the project to a different storage location by moving the project folder in the file system. Please make sure that move the entire project folder and to not make changes to the files and the sub folders of the project folder - otherwise the project can be corrupted.

In the root level of the project folder there is a file named **`FrontFace Project.ffpx`** which you have to select when opening the project in the *Assistant*. Please note that not only this file but all other files and sub folders in the project folder make up the actual project!

You should chose a secure location for project folder. It is also recommended to create a backup of this folder from time to time to make sure that your work cannot accidentally get lost. If you plan to work with multiple persons on a project, it is recommended to store it in a shared network folder, e.g. on a file server or a NAS so that users from different PCs can access it using their installation of the *FrontFace Assistant*.

When creating a project, you can specify the project type:

- **Digital Signage**
- **Touch Kiosk**
- **Mixed**

Depending on the selected project type, the user interface of the *FrontFace Assistant* will look slightly different. E.g., if you select "**Digital Signage**" as project type, all functionality related to interactive touchscreen menus will be hidden to reduce complexity.

However, setting the project type upon project creation is not a final decision. You can open the "**Project & Application Settings**" dialog of the *FrontFace Assistant* by clicking on "⚙ > **Settings...**" and change the project type in the "**Project**" tab at any time if you come to the conclusion that you also would like to use your project for different applications.

When the "**Mixed**" project type is selected, the complete functionality of *FrontFace* is enabled.

Additionally, you can enable the multi-user support 45 for the project. This allows to restrict certain features of the *FrontFace Assistant* to specific users. You should only enable multi-user support if you really do require it. As with the project type, you can change this option at any time in the "**Project & Application Settings**" dialog of the *FrontFace Assistant* by clicking on "⚙ > **Settings...**"

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Information: Project Integrity and Repairing Corrupted Projects

Since a *FrontFace* project consists of multiple files and folders, there is the potential risk that a project may be corrupted due to external influences (e.g. anti virus software accidentally deleting files or file system errors). When a *FrontFace* project is loaded by the *FrontFace Assistant*, an integrity check is applied to the project before it is loaded. In case of any issues, a dialog will be shown that allows to mitigate the detected issues. These issues can either be files (playlists, touch menus, menu buttons or players) that exist in the file system but are not referenced by the project itself. These files can be restored by relinking them into the project. On the other hand there may be files referenced by the project that do not exist in the file system. In this case, you can either remove the references or ignore the issue and try to restore the missing files in the file system by e.g. applying a backup or undeleting deleted files (if possible). Please be aware that once any repair measures have been applied to a project, the previous state cannot be restored.

In order to prevent loss of data, it is recommended to regularly create a backup of your project. You can use the **"Archive Project"** feature from the Settings Menu 43 for this purpose.

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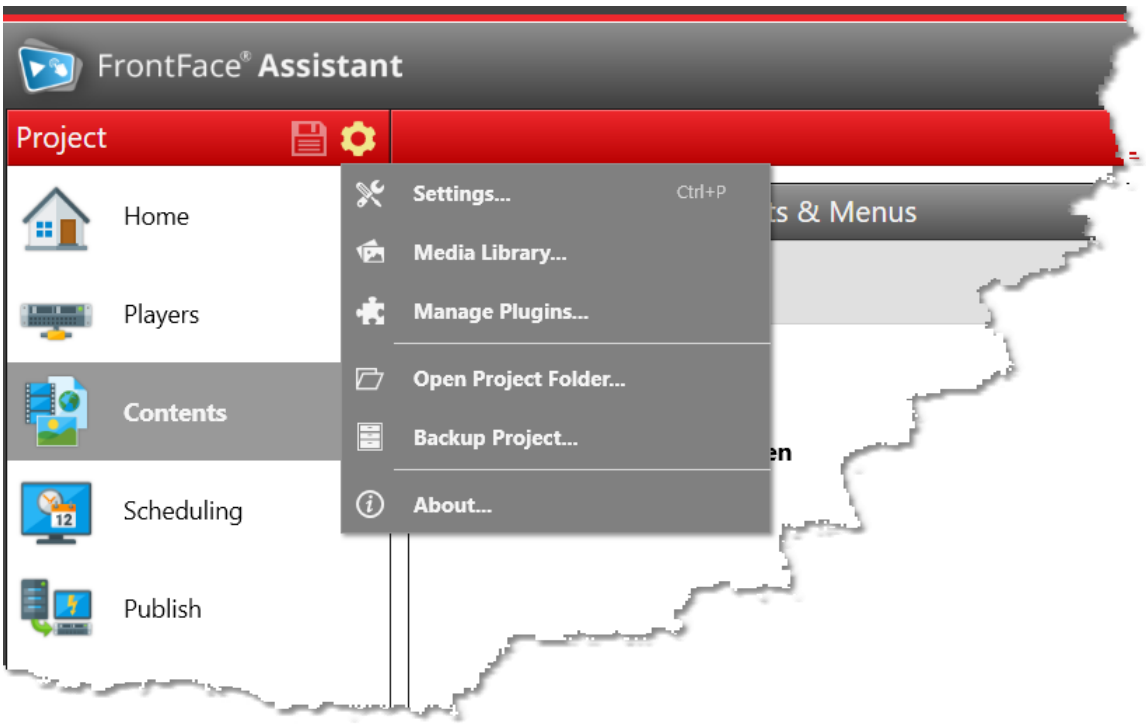
6.2 Settings Menu

Basic configuration options for both the *FrontFace Assistant* and the currently opened project can be reached by clicking on the gear icon ("⚙") in the project menu.



The settings menu provides the following menu items:

- "**Settings...**" to open the settings 43 dialog for project and Assistant settings.
- "**Media Library...**" to open the media library 120.
- "**Manage Plugins...**", to manage the plugins which are installed for the current project.
- "**Open Project Folder...**" to open the current project folder 41 in the Windows File Explorer.
- "**Backup Project...**" allows you to create a **backup** of your entire project as a single ZIP file. The ZIP file contains all files and folders from the project folder 41 and can be used to create a snapshot of your current project for backup purposes.
- "**Change Password**" lets you change the current user's password.*
- Click on "**Sign Out <User>**" to close the current project and to sign out the current user.*

*) These menu items are only available if multi-user support 45 is enabled!

6.2.1 Project & Application Settings

The settings dialog has two tabs, one ("**Project**") for settings that are related to the currently opened project and one ("**FrontFace Assistant**") for general application settings.

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6.2.1.1 Expert Mode

In order to keep the user interface of the *FrontFace Assistant* as clean and intuitive as possible, certain features that are not required by the average user are only available if the so called "**Expert Mode**" is enabled.

You can choose to activate or deactivate the expert mode globally for your project in the "**Project**" tab of the settings dialog of the *FrontFace Assistant*.

In certain dialogs, you can find a separate check box in the title bar of the dialog where you can temporarily turn the expert mode on or off which will hide or reveal additional settings and controls in that specific dialog:

The expert mode is enabled by default in dialogs when one of the following conditions is met:

- The expert mode is globally turned on in the project settings 43
- An expert setting of the dialog differs from the default value

The following features are only available, if the expert mode is enabled:

- Multi-Language support 81 for touch menus
- Access Restriction for playlist pages 69 and touch menu buttons 75
- Actions 121 (for playlists, touch menus, touch menu buttons and pages)
- Custom Keyboard Shortcuts 158 for interacting with playlists and touch menus
- Web Page 94 scripting 152 function
- Design settings for playlists 67

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6.3 Users

If you create a project in the *FrontFace Assistant*, all features and options are fully available to you without any restriction. If several users are supposed to work with a project, the project must be created on a jointly accessible storage location (e.g. a network share) and the *FrontFace Assistant* must be installed on each of the users' PCs. The access rights to the project result from the access rights for the project storage location.

Simultaneous editing of a project by two or more users is not supported. If a user opens a project that is already opened by another user in the *FrontFace Assistant*, a warning appears with a reference to the user who is already active. In this case, all functions are generally available without restriction, but conflicts or update anomalies can occur. Therefore, in such a case, coordination between the users concerned should take place. The project status at which the last user triggers the **"Save Project"** function is always persisted.

Even if the real parallel use of a project rarely plays a role in practice, it can make sense to restrict certain users' access to selected areas or functions of the *FrontFace Assistant*. For example, a user who only creates and maintains content should not have access to the player administration in order to avoid accidentally incorrect configuration of the project. It is also conceivable that a user may create and update content, but may not publish it without prior control by a manager. Furthermore, it can also be helpful to reduce complexity if a user does not need to access the full range of functions.

To enable **multi-user support** with different authorizations, you can optionally activate the **"Multi-User Support"** for a project. This can either be activated when creating a new project or at a later point of time in the project's settings dialog 43. If necessary, the function can also be deactivated again in this dialog, if it is no longer needed.

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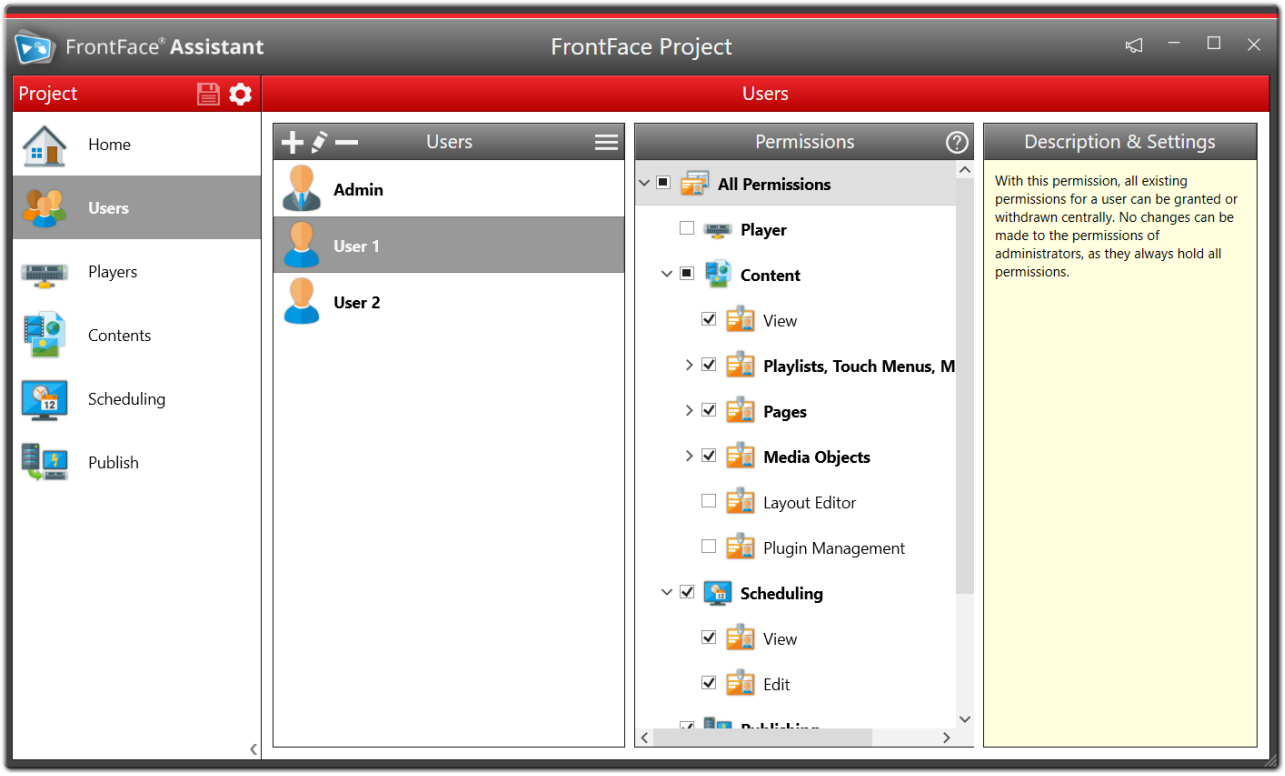

Multi-User Management in the FrontFace Assistant

If multi-user support is activated, an **administrator** must first be created. An administrator always has full access rights to the entire project and can create and manage other administrators and users. For **users**, the access rights for certain areas and functions can then be specified in the "**Users**" menu of the *FrontFace Assistant*.

Both users and administrators each have a user name (login) and a freely selectable password.

IMPORTANT: Please remember / make a note of the user name and password of the administrator of the project. Recovering the password or resetting the multi-user support is NOT possible without a previous, successful login!

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6.4 Players and Screens

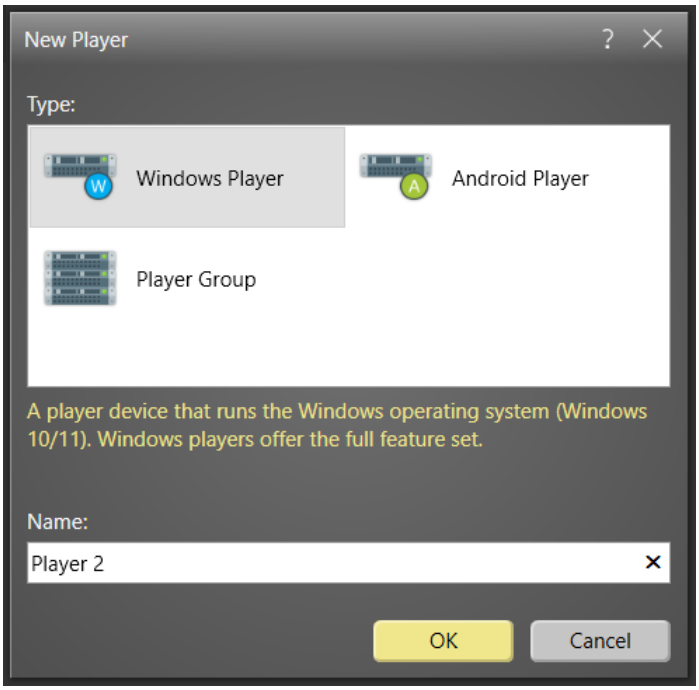
In the "**Players**" menu section of the *FrontFace Assistant* you can manage the infrastructure of your project. This covers the players (on which the *FrontFace Player App* is executed) and the screens which are hooked to these players.

You can create either individual players or player groups that group existing players into a "virtual" player with identical settings and for displaying the same content.

6.4.1 Player Types

When creating a new player, you have to select the **player type**. Currently "Windows Player" 47 (a Windows-based player PC), "Android-Player" 48 and "Player Group" 49 (a virtual player that groups existing players) are available.

Once you selected a player type, this option cannot be changed (you have to delete the player and create a new one if you want to change the player type!).



6.4.1.1 Windows Player

The **Windows Player** represents a player system on which the *FrontFace Player App* 27 for Windows is running (see System Requirements 15).

In the settings dialog of a Windows Player you can optionally provide credentials (*login*, *password* and optional *domain*) to access the publishing target. This is useful if the player PC is not inside a domain or if it is being accessed from outside the domain and the access to the network share which represents the publishing folder requires a dedicated login.

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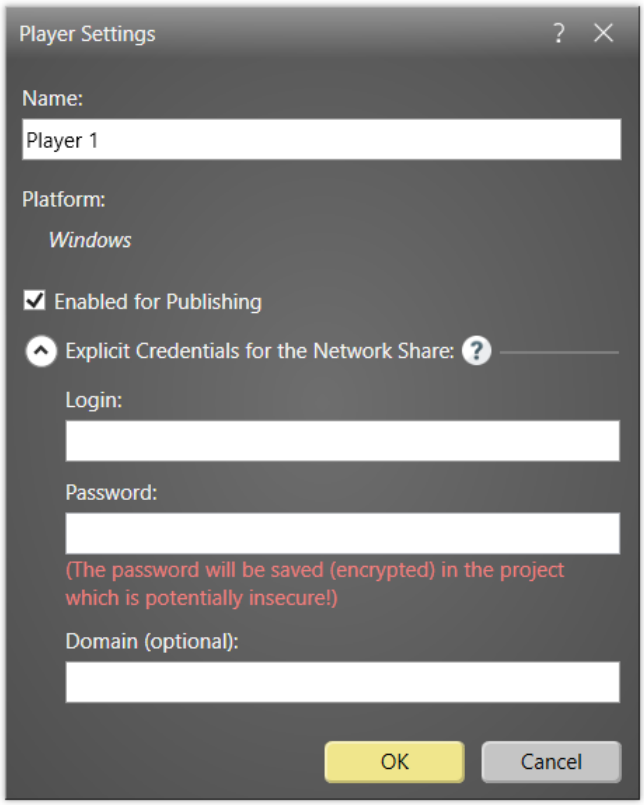
If you can access the publishing target directly using the *Windows Explorer* from your PC without any explicit credentials, please leave these settings blank.

Please note that the password is stored locally in the project. Though the password is encrypted, this is a potential security issue.

In the "**Players**" menu section, you can also configure the screen(s) and the player settings.



6.4.1.2 Android Player

The **Android Player** represents a player system on which the *FrontFace Player App* 31 for Android is running (see System Requirements 17).

In the settings dialog of an Android Player you can optionally provide credentials (*login*, *password* and optional *domain*) to access the publishing target. This is useful if the player PC is not inside a domain or if it is being accessed from outside the domain and the access to the network share which represents the publishing folder requires a dedicated login.

If you can access the publishing target directly using the *Windows Explorer* from your PC without any explicit credentials, please leave these settings blank.

Please note that the password is stored locally in the project. Though the password is encrypted, this is a potential security issue.

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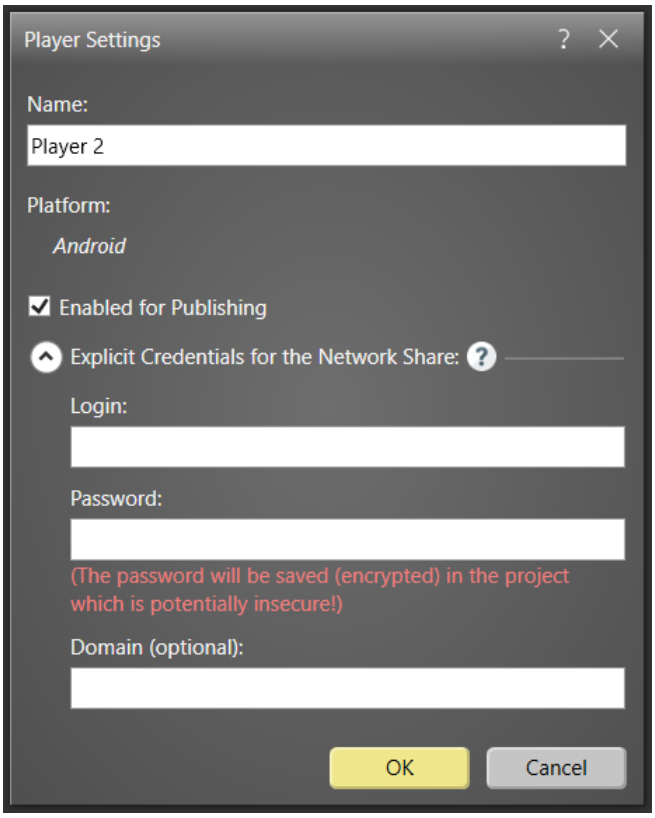
In the "**Players**" menu section, you can also configure the screen and the player settings. Please not that an Android Player does not support multiple screens.



6.4.1.3 Player Group

Every player that is addressed by *FrontFace* needs to be set up separately in the "**Players**" menu section of the *Assistant*. However, there are cases where one would like to play the same content on all players or at least a set of players. To prevent a lot of manual work (assigning the same scheduling to all players), it is possible to create **player groups**. A player group acts like a normal, physical player in the "**Scheduling**" section 126. This means, you can create timers and event sources for screens of player groups in the same way as for normal players.

Once you created a new player group, you can assign existing players to that group. Please note that you can only assign players to a group that are of the same player type (e.g. Windows Player).

In the "**Players**" menu section, you can also configure the screen(s) and the player settings. Please note, that you cannot set a publishing method for a player group. This is simply because this information is taken from every individual player that is assigned to a group during the publishing process.

The player settings that are defined in a player group will be scoped "over" the settings that are already defined for an individual player of that group. This means that the settings of a player group have a higher priority compared to the settings of an individual player.

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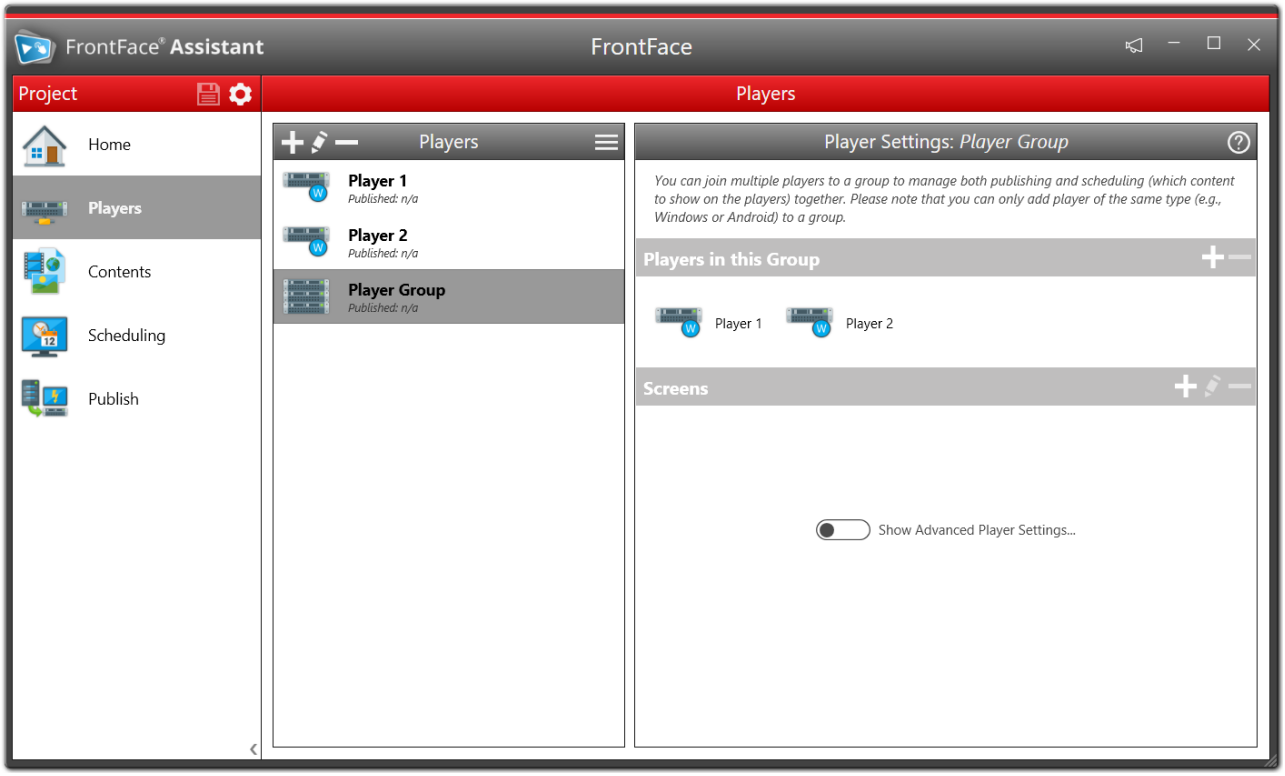

A player group which consists of two Windows players

6.4.2 Publishing Methods

For every player (except for player groups), you have to select a **publishing method**. The publishing method defines how the content is deployed from the PC with the *FrontFace Assistant* to the player where the *FrontFace Player App* is running. Which publishing mode you select depends on the setup you have chosen for your *FrontFace* installation and the requirements that you have in your individual scenario.

There are two basic terms that all publishing methods use which you should know: The location (usually a folder) where the *FrontFace Player App* receives the updated content from the *FrontFace Assistant* is referred to as **"Publishing Folder"**. The location where the *FrontFace Assistant* deploys the updated content during the publishing process to is referred to as **"Publishing Target"** which is virtually the same as the **"Publishing Folder"**. So how this link between *Player App* and *Assistant* is referred to (either **"Publishing Folder"** or **"Publishing Target"**) depends on the perspective from which you are looking (either from the *Player App* or from the *Assistant*).

The following publishing methods are available:

- **All-in-One** 51 **(Directly on Local PC)**
- **Directly to Player** 52 **(Local Network)**
- **File Server** 53 **(Local Network)**
- **Web Server** 54 **(Internet)**
- **Cloud Storage Service** 55 **(Internet)**
- **Offline Media** 57 **(USB Thumb Drive)**

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6.4.2.1 All-in-One (Directly on Local PC)

A very simple, but yet not very typical setup is the **"All-in-One (Directly on Local PC)"** setup where both the *FrontFace Player App* and the *FrontFace Assistant* live on the same system. In this case, the *Publishing Folder* and the *Publishing Target* refer to the same, local folder on the player (by default this is **`"%PROGRAMDATA%\mirabyte\FrontFace\Publish\"`**). For this setup, no additional configuration is needed which means that this is working out-of-the-box.

A big downside of the "All-in-One" approach is that you have to shut down the *FrontFace Player App* and launch the *FrontFace Assistant* every time you want to apply changes. Just in case you have a system with at least two screens where one is used for the *FrontFace Player App* and the other for normal use (including the *FrontFace Assistant*), the *FrontFace Player App* can also be left running while updating content. Please see section Shared use of a PC as Workstation and Player 176 for more details on this.

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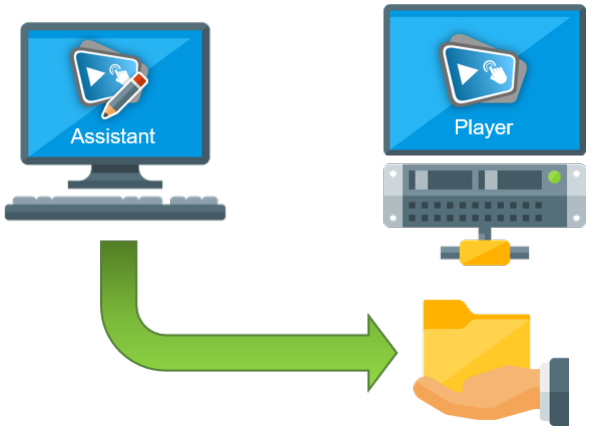
6.4.2.2 Directly to Player (Local Network)



In this scenario, each player and the PC(s) with the *FrontFace Assistant* are connected to the same, local area network (LAN). A network share is created on every player that provides external access to the so called "**Publishing Folder**", a local folder on the player. The *FrontFace Assistant*, which is installed on a separate computer, then copies the updated content during the publishing process to the player into the *Publishing Folder*. In the *FrontFace Assistant*, the *Publishing Folder* is referred to as "**Publishing Target**" since not the actual folder but the corresponding network share (UNC path) is entered here.

The *FrontFace Player App* automatically monitors the *Publishing Folder* and picks up the updated content once the publishing process has fully succeeded.

The advantage of this setup is that it works very stable and reliable. The downside is that you can only publish content to a player when the player is running and when it is connected to the local network. To be able to publish to a player that is currently down or unavailable, you can consider the File Server (Local Network) 53 publishing method as an alternative.

When installing *FrontFace* using the installation package, you can select an option to automatically create a network share for the *Publishing Folder*.
The name of this share is by default **`\\<PCNAME>\FrontFace\`** and corresponds to the local folder **`%PROGRAMDATA%\mirabyte\FrontFace\Publish\`**.

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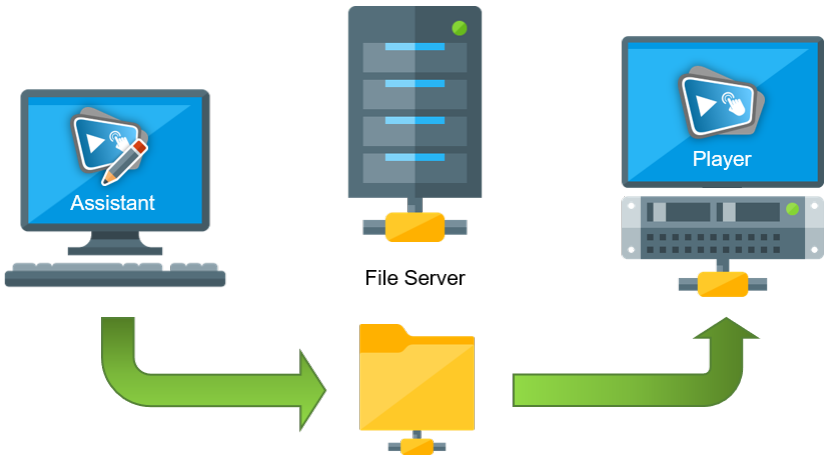
6.4.2.3 File Server (Local Network)



The **"File Server (Local Network)"** setup is very similar to the **"Directly to Player (Local Network)"** 51 setup. The only difference is that the *Publishing Folder* does not reside locally on the player but on a separate file server (e.g. a NAS). The *FrontFace Player App* then monitors the network share that points to the *Publishing Folder* on the file server and the *FrontFace Assistant* also uses the same network share as *Publishing Target*.

The advantage of this setup is that you can even publish a to player that is currently down or not connected to the local network since the *Assistant* only copies the content to the file server. Once the player has booted and is reconnected to the network, it will detect the new content in the *Publishing Folder* on the file server and start the update process automatically.

Of course, in order to use this setup, you need to have a separate file server. In case of the **"Directly to Player (Local Network)"** setup, no file server is needed at all.

Notice: When using a file server, it is highly recommended to NOT map the shared folder with the *Publishing Folder* to a drive letter on the player. The *Content Update Service* of *FrontFace* will then be able to also handle cases when the server is not available or not yet available (e.g. during the start of the player). If the share is mapped to a drive letter, the player will treat the publishing folder like a normal, local folder that has to be available all the time which is not desired in this case.

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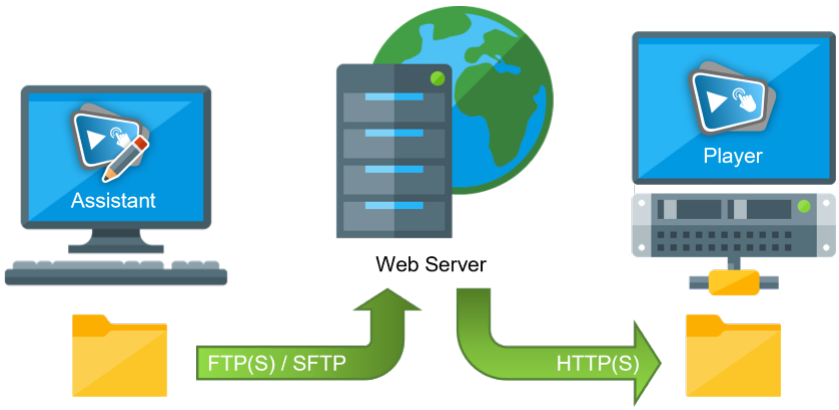
6.4.2.4 Web Server (Internet)



For the "**Web Server (Internet)**" method, a conventional Web server is used as transport layer between the PC with the *FrontFace Assistant* and the *Player App*. Usually, the Web server on the Internet, so the only requirement is Internet connectivity.

There are also no special requirements for the Web server (e.g. Apache, nginx, etc.) itself. It must only support FTP(S) or SFTP for uploading. The player is then downloading the content via HTTP(S). Optionally, access by the player can also be secured via basic authentication, if required.

An empty directory should be created on the Web server for each player, into which the contents are then published via FTP using the *FrontFace Assistant.* The credentials (host, user name, password and, if necessary, the directory on the server) must be provided in *FrontFace Assistant.* The upload via FTP then directly takes place and does not require an additional, external FTP program.

In the *Player App*, the full URL to the directory where the content was published to with *FrontFace Assistant* must be specified in the Maintenance Menu 28.

For example, if a player has been published to the `"\htdocs\players\player1"` directory via FTP, the URL for the player could typically look like this, depending on the actual configuration of the server: **https://www.domainname.com/players/player1/**

Notice: For security reasons the FTP protocol is NOT recommended since it does not encrypt both credentials and data. You should select either FTPS (FTP+SSL) or SFTP (SSH). If available, you should always choose **SFTP** as transfer protocol for uploading content with this publishing method!

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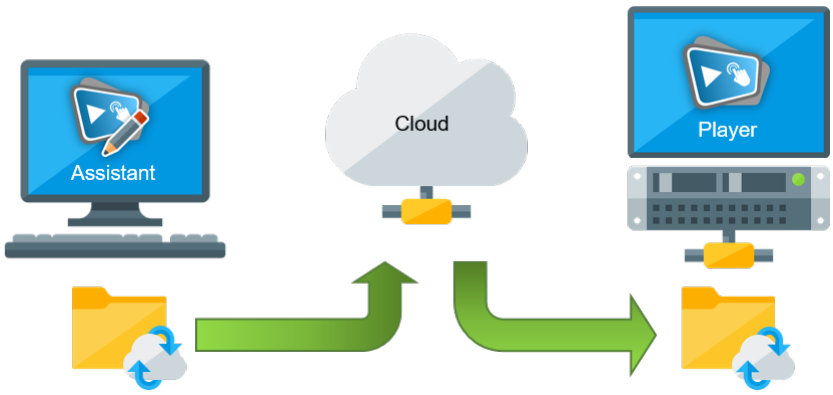
6.4.2.5 Cloud Storage Service (Internet)



In case the computer with the *FrontFace Assistant* and the player(s) are not in the same network but do have access to the Internet, it is possible to use a cloud storage service such as *OneDrive* or *Dropbox* for the deployment of the content. Most cloud storage services offer free plans with a capacity ranging from 5 to 15 GB which is totally sufficient for most scenarios. Likewise, many providers of NAS systems now offer their own synchronization services as well, which you can also use.

Notice: In case you have the possibility to establish a VPN (virtual private network) connection between your network and the player, there is no need to use a cloud storage service. In this case the deployment works exactly in the same way as the LAN-based deployment in a local network 52.

The *FrontFace Assistant* does not directly publish the content to the player(s). Instead a local folder is selected as *Publishing Target* which is synchronized with the cloud storage service. On the player(s) a local folder is selected as *Publishing Folder* which also synchronizes with cloud storage service. The basic concept of this setup is that the *Publishing Folder* is replicated automatically over the Internet from the PC with the *FrontFace Assistant* to the player(s). The actual replication is handled by the client application of the cloud storage service, e.g. *OneDrive* or *Dropbox*.

The *FrontFace Player App* automatically checks if the content has been completely synchronized by the cloud storage service and starts the automatic update process.

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Attention: For the automatic synchronization with the cloud service of your choice to run in the background, the **client application** of the respective service must be running. Most clients are started automatically after installation when the Windows Explorer shell (**`Explorer.exe`**) starts. If you have configured *FrontFace* (e.g., using the *FrontFace Lockdown Tool* 160) to start automatically (possibly even as a shell replacement!), it may happen that the client application of your cloud service does not run and thus no synchronization takes place.

If you experience this behavior, you must manually ensure the automatic start of the client application yourself. It is best to use the **"Auto Start Programs"** function of the *FrontFace Lockdown Tool* 160 to automatically start the client application of your cloud service. Here, the *Windows Task Scheduler* is then used internally to start the programs.

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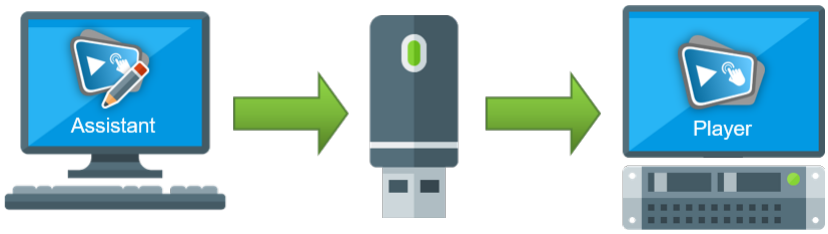
6.4.2.6 Offline Media (USB Thumb Drive)



In a case where no network connection is available between the player(s) and the computer on which the *FrontFace Assistant* is installed on, an offline medium such as an USB thumb drive, a SD card or any other removable media can be used to update the player manually.

Simply plug an (preferably) empty removable drive such as an USB thumb drive into the PC on which you are running the *FrontFace Assistant* and select that drive letter of the device in the player settings. When you publish, a folder named **"\FF_DATA\"** is created that contains the published content.

Once the publishing process has succeeded, eject the device and plug it into the player where the *FrontFace Player App* is currently running. *FrontFace* will detect the removable drive with the new content update itself automatically. No further action is required. Once the *FrontFace Player App* has successfully carried out the update, you can remove the device again.

Installation: For the very first time, the removable device has to be registered with the *FrontFace Player App* (see also "Player Configuration" 28). You need the register the actual device with the published content on it (or with a manually created empty folder **"\FF_DATA\"** in the root of the file system). Plug the device into the player while the *FrontFace Player App* is running and hit the **ESC** key. Then, click on the **"..."** button in the lower right corner of the screen and select **"Player Settings"**. Select the **"\FF_DATA\"** folder on the removable device as **"Publishing Folder"** for the player and then click on **"OK"** to apply the settings. Once the *Player App* has restarted, the device can be used for on-the-fly content updates just by plugging it into the player while the *Player App* is running.

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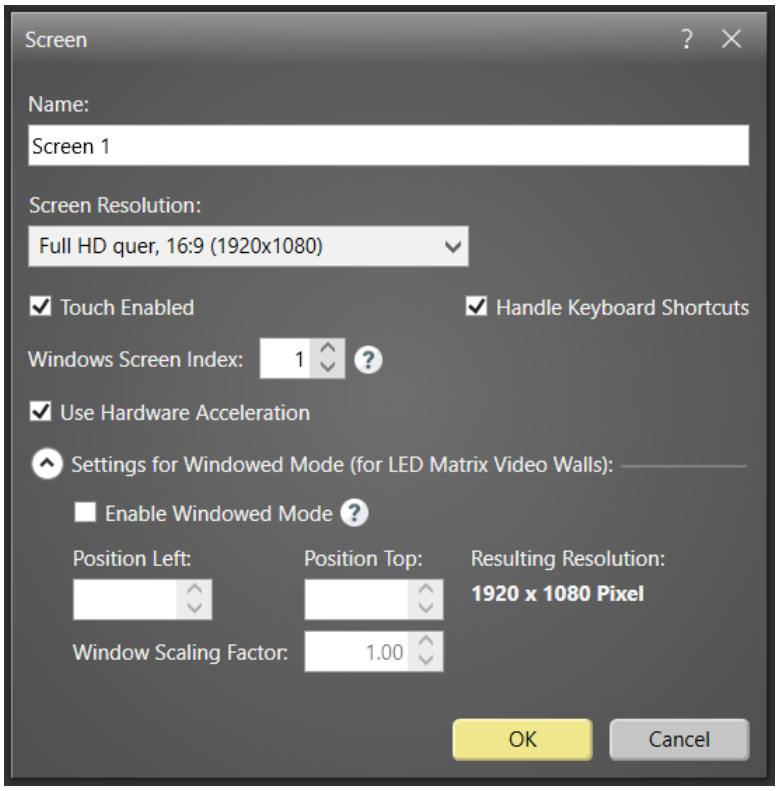
6.4.3 Screens

Every player needs to have at least one screen. In the "**Scheduling**" section, you can assign which content is supposed to be shown on the screen of a player.



When creating a new screen, you can define several settings depending on the type of screen (which also depends on the type of player). It is important to notice that some settings such as "**Screen Resolution**" have no direct effect on the actual device. The setting is preliminary for internal use (e.g. to provide a realistic preview).

If your screen is a touchscreen and you want to allow interaction with the user, make sure that you mark the screen as touchscreen when creating it ("**Touch Enabled**"). Otherwise, all interactive features will be disabled in order to increase system's overall performance.

For some types of screens (e.g. screens of Windows-based players) it is possible to enable or disable hardware acceleration. If you should experience any issues, you can disable the hardware acceleration.

You can also define the "**Windows Screen Index**": A value of `"-1"` will span the content across all screens that are connected to the player (video wall). A value of `"0"` (default) will show the content on the primary screen (as configured in the Windows display settings). Any other number (`"1"`, `"2"`, `"3"`, ...) corresponds to the Windows screen index as defined in the Window display settings.

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Notice: In rare cases it can happen that the Windows screen index assigned by Windows does not match with the one you set in the screen settings in *FrontFace*. In such a case you, please start the *FrontFace Player App* on the system, press **ESC** to go into the Player Maintenance Menu 27 and select "**Show Screen Bounds**". This will display the corresponding screen index on each screen for identification purposes.

In the screen settings dialog, there are also optional settings for configuring video walls 60.

6.4.3.1 Multi-Screen Systems

FrontFace fully supports multi-screen systems. These can be divided into three different types: First are **true multi-screen systems** where multiple screens are attached to a single player where either the same or different content is supposed to be shown on the screens. Then, there are **"transparent" multi-screen systems** where the screens are connected to the player in a way that the player only "sees" one single screen and the signal is either split up by special hardware ("splitter") or by the driver of the video card. In this scenario all screens always show the same content. And finally there are **video walls** where multiple screens resemble one large screen that is addressed as a single screen. For more information on this type of multi-screen systems, please see the section Video Walls 60.

⇨ Setting up a True Multi-Screen System:

In order to address multiple screens that display either the same or different content, the player hardware needs to have a graphics adapter that comes with the desired number of ports to physically connect the screens. The more screens you want to use, the more powerful should the hardware be in regards to performance. To work with *FrontFace*, the screens have to be configured in the Windows display settings as "**Extended Desktop**". This means that one screen is the primary screen (which has only technical meanings) and the other screens are secondary screens. If you are using Windows 10, we recommend that all screens should have the same DPI (scaling) settings. By the way, this is the same setup as one would choose if creating a multi-screen desktop system.

In the "**Players**" section of the *FrontFace Assistant*, select the player to which the screens are connected to and add the desired number of screens to the list of screens of this player. Make sure that the *Windows Screen Index* corresponds to the index that has been assigned to the screen by Windows in the display settings (use the "**Identify**" button, to show the Windows screen index or (recommended) "**Show Screen Bounds**" in the Player Maintenance Menu 27!).

Once you have set up the screens in the "**Players**" menu, you can head over to the "**Scheduling**" menu section where you can assign the content that is supposed to be shown on each screen. You can either select the same content for all screens or assign different content. Each screen has it's own scheduling. Therefore you can define individual schedule timers and event sources for each screen.

Once you published the new configuration to the player, the content will appear as configured on the attached screens of the system.

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6.4.3.2 Video Walls

FrontFace also supports video walls. There a basically two types of video walls available which are both supported by *FrontFace*:

⇨ LED Matrix Video Walls:

Matrix video walls typically have a relatively low resolution and every pixel is made up by an LED point that can light up in RGB colors. These video walls typically use a method called "screen capturing" to display content. A special application or driver that comes with the video wall controller is used to define an area on the (normal) screen of the player PC which is then mirrored onto the video wall. In order to display content, the content has to be shown within this area on the screen. *FrontFace* supports a "**windowed mode"** which makes the *Player App* show the content not in full screen mode on the entire screen but in a window. The position and size of the window can be configured in the screen settings dialog. The size is taken from the resolution settings of the screen. In addition to that, you can also define a **"Window Scaling Factor"** which increases or decreases the size of the window. This setting is helpful since LED matrix video walls typically have a very low resolution. Common elements such as a Web page or text will not render well due to the small space that is available for the content. You can therefore define a higher resolution of the screen and then correct the size by providing a scale factor <= 1.0. This way, the content gets rendered in a higher resolution and is then scaled down to the actual resolution of the matrix.

⇨ Composite Video Walls:

These video walls are created by combining multiple (low bezel) screens to one single large screen. In order to use this type of video wall, you need a graphics card, video driver or adapter box that stitches the individual screens to one single "virtual screen" that can than be addressed by the Windows operating system. In such a set up, you just need to configure one screen for your player that has a resolution that is made up of the resolutions of the individual screens. If you are using a multi-head graphics card that does not support addressing the screens as one single large screen but as separate screens (Extend Desktop Mode), you can still use *FrontFace* to address the entire video wall. Make sure that all screens are aligned correctly on the Windows display settings dialog. Then create a single screen in the Player section of the *FrontFace Assistant* and select a value of "-1" as **"Windows Screen Index"** which enables screen spanning. This means that the player window that normally covers the entire real estate of a single screen now covers the complete desktop area (=all screens). Please take into account that this set up is not recommended for large video walls since it can have negative influence on the system performance. For large video walls, the video adapter or driver should do the task of stitching the screen together to one single addressable screen.

6.4.4 Services

Services represent additional functionality that is executed in the background while the *Player App* is running. With the help of service plugins, such functionality can be installed. An example of a service is the **Analytics Plugin**, which is available separately and can be used to track user interactions or to log the playout of content.

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After you have installed a service plugin, you can configure the service-specific settings in the settings dialog. Services can be set to be active or inactive. An inactive service behaves as if it were not installed at all.

6.4.5 Player Settings

Apart from the publishing method, the publishing target and then screen(s), there are also multiple settings available for players. If you click on "**Show Advanced Player Settings...**" in the "**Players**" menu section of the *FrontFace Assistant*, you see the list of available settings. Each setting has a "**?**" icon that shows some information about what the setting does when hovering over it using the mouse. In case the value of a setting differs from the default value, another icon with a little pen appears next to the setting name. If you click on the pen icon, the value of the setting is reverted to the original default value.

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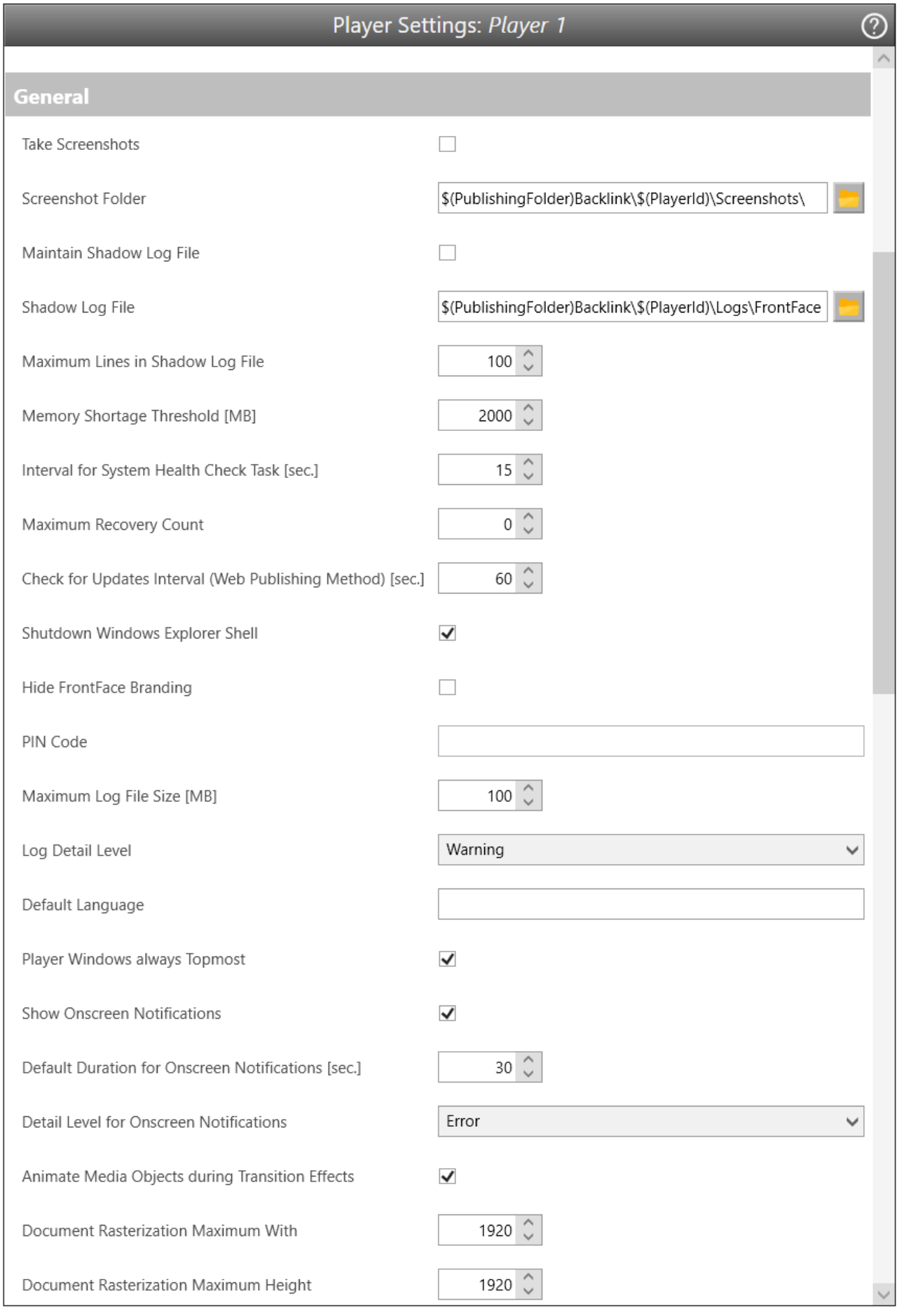

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Warning: Please note that changing the player settings can cause problems. You should only change settings if you know what you are doing!

Some settings cannot be changed remotely and need to be changes locally at the player. Please see the section Maintenance Menu 27 for details on these local settings.

6.4.6 Player Status

Due to the nature of the *FrontFace* system architecture, there is no central server that monitors the status of a player. So once content has been published to the player, you either have to check the result by physically visiting the screen or by using a remote connection application/protocol such as RDP or VNC.

However, *FrontFace* has a mechanism built-in that supports a back link channel from the *Player App* to the *Assistant* using the publishing folder. In the **"Players"** menu section of the *FrontFace Assistant*, you can click on the **"Check Player Status"** button in the list box with the available players to check the current status of the selected player. This status information contains a time stamp when the last status information was retrieved, a screen shot of the screen(s) that are registered with the player and access to the log file of the *FrontFace Player App*.

The player status information is only available if you have already published once to the player and if there is a direct connection between the player and the PC with the *Assistant*. When using the "Offline Media" publishing method 57, the player status information is not available.

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6.4.7 Player Preview

When creating content such as playlists or touch menus, you can use the Content Preview 125 to see how the content will look like when it is being played by the player. However, the preview of a playlist, a playlist page, a touch menu or a touch menu button only shows that specific content. Additional features of a player, such as scheduling and event source are not active in Content Preview.

If you want to simulate the entire player on your local computer, including, player settings, scheduling and event source, you have use the **"Player Preview"**. In the "Players" 47 section of the *Assistant*, there is a preview button ("▶") next to each player in the list of players.

The screens of the player PC and either be shown in separate windows or you can use the physical screens that are connected to your PC as player screens in full screen mode. In order to use the full screen feature, your PCs must have the same number of screens (or more) as the configured player PC in your project.

Please note that updating content remotely ("Publishing" 130) is not supported by the Player Preview. You can only preview the currently configured state of your project.

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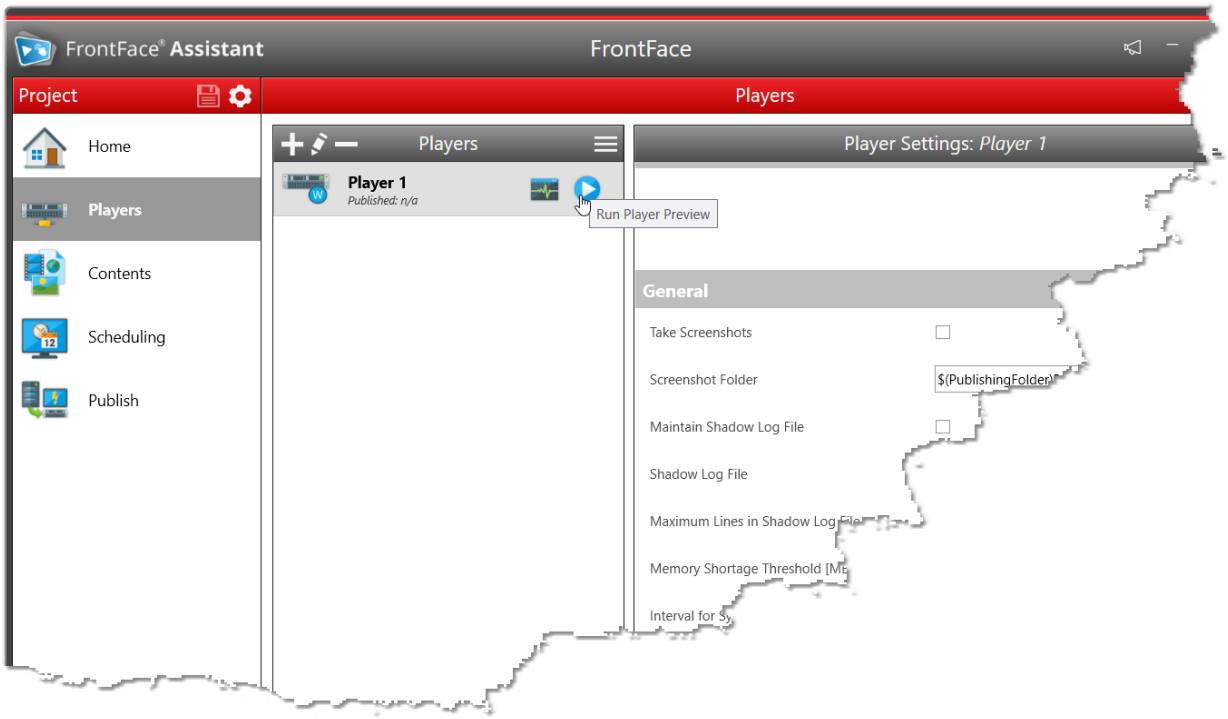

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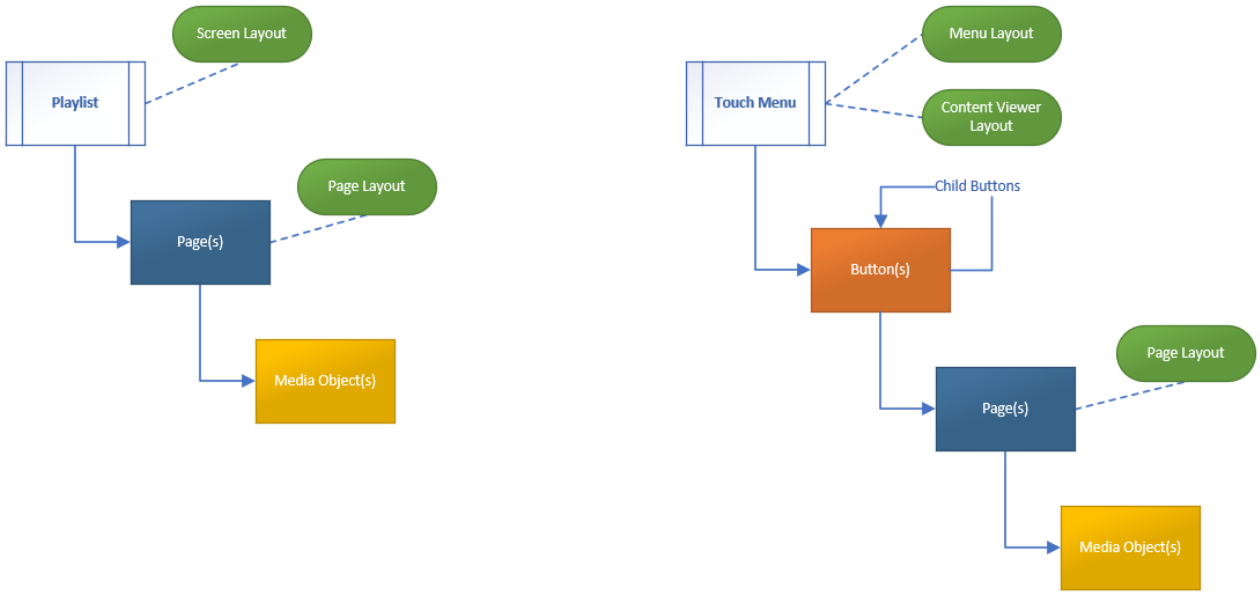
6.5 Content Management

"Content is King!" - So needless to say that the content is the most important thing of every digital signage and kiosk application. *FrontFace* uses some simple, easy-to-understand concepts for content management.

Content is organized in **"Playlists"** 67 and **"Touch Menus"** 73. Playlists represent a sequence of screen pages that contain the actual content which are played automatically, usually as infinite loop, while touch menus arrange pages in a hierarchical menu that can be navigated interactively by the user.

"Pages" 69 within playlists and touch menus have a so called **"Page Layout"** 82 which partitions the screen into "Containers" which can hold so called **"Media Objects"** 86 which represent the actual content (such as images, videos, text, Web pages, PDFs, etc.).

Here is an overview of the content data model of *FrontFace*:



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6.5.1 Playlists

Playlists are one of the common content types supported by *FrontFace*. A playlist is a sequence of pages that are displayed as an infinite loop, similar to a *PowerPoint* presentation that is run automatically.

A playlist defines some default settings 67 (such as page display duration, transition effect, etc.) that are applied to all pages within the playlist that have not defined different values for these settings otherwise.

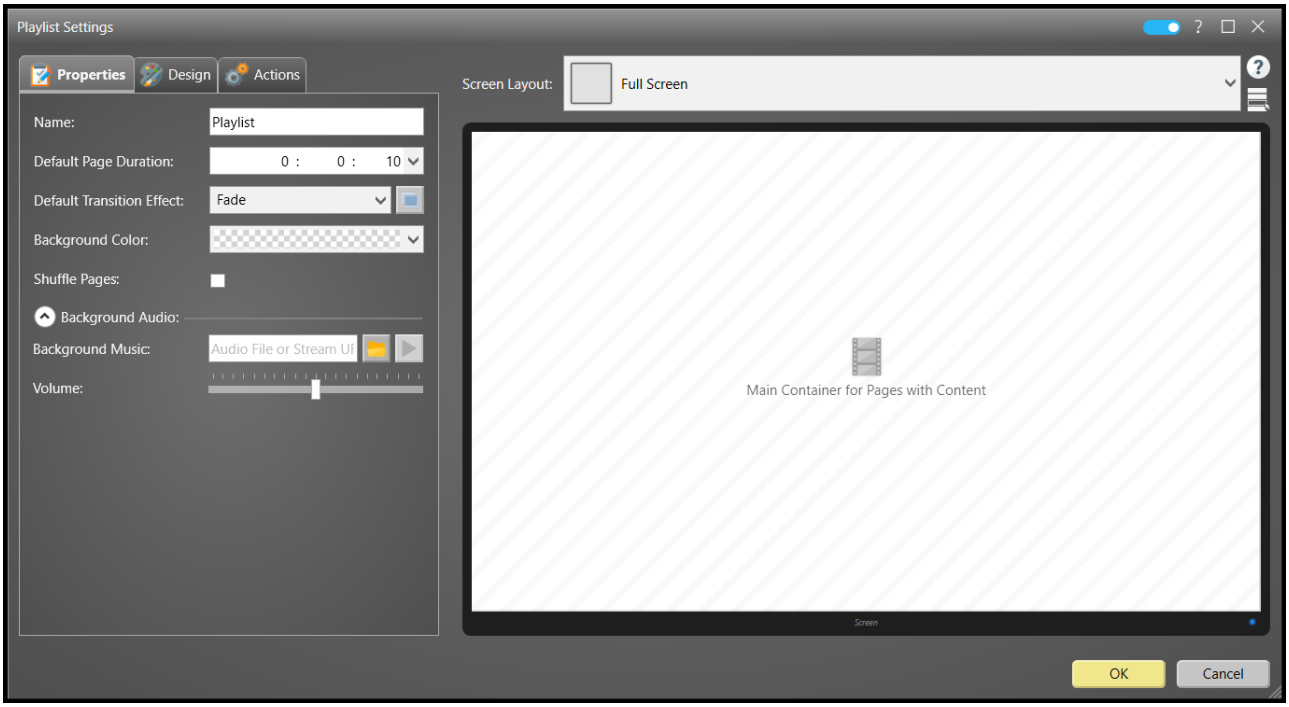
The pages 69 of a playlist are shown within the main container of the playlist's screen layout 82.

Each page has a so called page layout 82 that defines how the page is partitioned and where and how many media objects 86 can reside on a page.

You can add new pages to a playlist, remove existing ones or change the ordering. More contextual commands are available if you click on the burger menu (=) or perform a right-click on a playlist item in the list of playlists in the *FrontFace Assistant*.

6.5.1.1 Playlist Settings

In the settings dialog of a playlist, you can define various settings of the playlist:



Dialog: Playlist Settings

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Default Page Duration

The **"Default Page Duration"** is applied for all pages 69 within that playlist that have not specified an individual display duration or that do not contain any media objects with a natural duration 71.

Default Transition Effect

The **"Default Transition Effect"** is applied when the transition from one page to the next is applied unless the target page has specified an individual transition effect. You can also show a preview of the selected transition effect or make adjustments to the selected effect.

Screen Layout

The most important setting of a playlist is the **"Screen Layout"**. The **main container** of the screen layout 82 is the area, where the playlist pages are being shown while all other containers and their media objects remain static during the entire runtime of the playlist. This way, you can e.g. show a ticker type that is permanently visible while the actual pages of the playlist are shown one after another.

Some layouts have **predefined media objects** (e.g. a news ticker at the bottom of the screen). These can be configured in the settings dialog of the playlist by clicking on them with the mouse. Containers with predefined media objects are shown in orange color. It is not possible to entirely remove a predefined media object or replace it with a different media object! It is only possible to configure the predefined media object (e.g. change the feed URL of a scrolling ticker, etc.).

Playback Order

By selecting the **"Shuffle Pages"** option, the predefined order of the pages is ignored and the playlist pages are shown in a random order.

Background Color

You can also specify a **"Background Color"**.

Background Music

A **"Background Music"** an be set both on playlist and on page 69 level. You can either select an MP3 or WAV file or provide the URL to an audio stream. When a background music is set on playlist level, it can be overridden or muted by the background music of a playlist page. In the advanced settings 61 of a player you can define the duration that is applied to the fading between two audio tracks. Background music is always looped automatically.

Design

If the expert mode 44 is enabled, the theme for dialogs (e.g. for content sharing 145) can be customized in the **"Design"** tab.

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Actions

For integrating special functionality, "**Actions**" are supported as well. Please see section Actions 121 for more information. This feature is only available, if the expert mode 44 is enabled.

6.5.1.2 Playlist Pages

Every page of a playlist 67 has a page layout 82 that determines how the screen is partitioned. The layout provides one or multiple *containers* that can be filled with media objects 86 (such as images, video, text, etc.).

The settings dialog of a playlist page allows you to select a page layout. In addition to that, you can define the display duration of the page. If no value is provided (**Automatic**), the display duration for the page is either taken from the default duration value of the playlist or it is determined by the natural duration 71 of a media object on that page. It is also possible to configure a custom transition effect for a page. If "**Automatic**" is selected as transition effect, the default transition effect of the playlist will be applied.

For every playlist page, there is a set of contextual commands available. By either clicking on the burger menu (**=**) or by performing a right-click on the list item of a playlist page in the *Assistant*, you can show the contextual commands that are available, such as "**Add Page**", "**Edit**", "**Delete**", etc.

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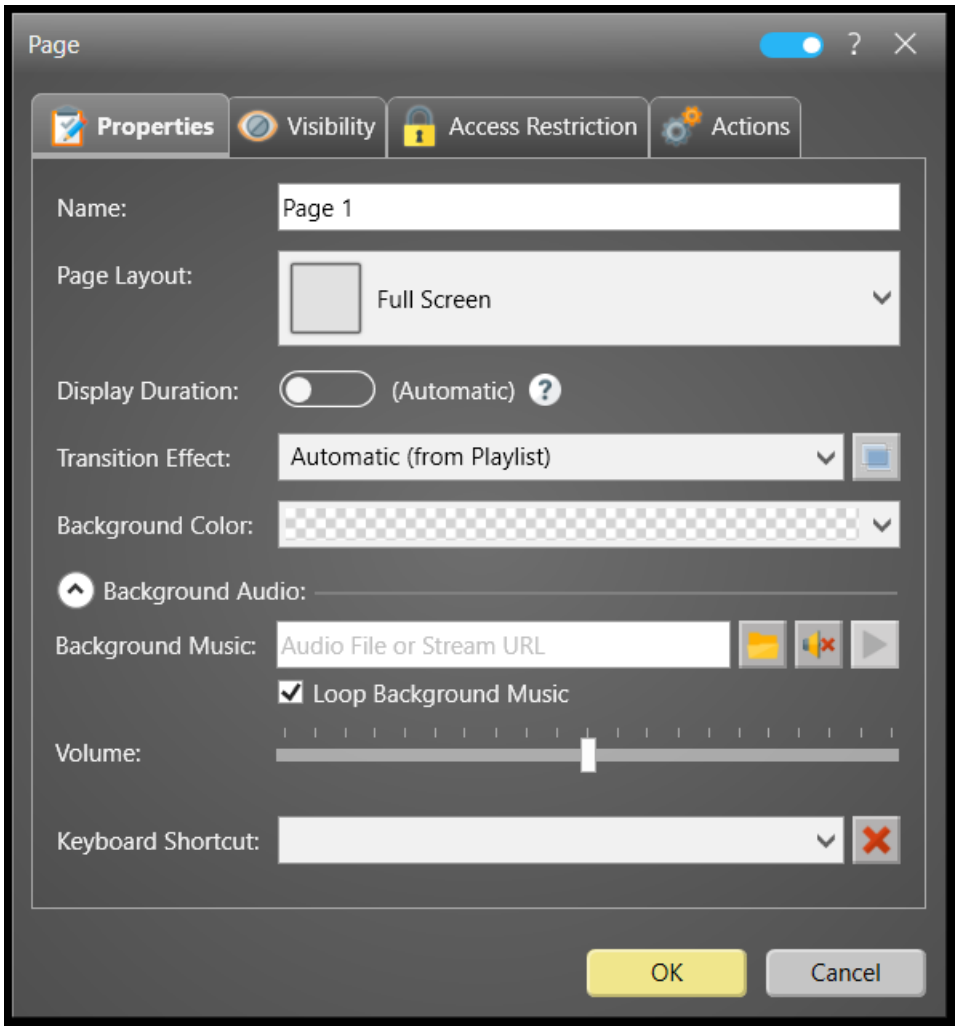

Dialog: Page Settings

Background Music

A playlist page can have a "**Background Music**". This music is only played, when the page is shown and stopped afterwards. If you have also defined a background music on playlist level 67, that audio track will be stopped while the background music of the page is playing. Instead of a background music (MP3, WAV or audio stream URL), you can also set the value `"about:mute"` which will mute the background music of the playlist while this page is showing. This is useful if you e.g. have defined a background music on playlist level and add a page with a video that itself has an audio track.

Page Visibility Settings

The page settings dialog also offers options to configure the "**Visibility**" of the page. A page can either be (always) visible, hidden (not shown in the playlist), "**Only Visible within this Time Window**" or "**Only Visible on Certain Player(s)**".

The "**hidden**" status can be used to remove a page from a playlist without deleting it (e.g., if you have prepared a page that needs to be activated very quickly or that serves as a template for other pages by creating a copy of it on demand).

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The "**Time-Window**"-based visibility lets you show/hide the page within the playlist depending on the current date/time. There are three different modes for time-window-based visibility available: A **defined time-window** (from start date/time until end date/time), a **time-window with given daily start/end time** and a **pattern based on weekdays** (e.g. from Tuesday to Friday).

For all time-window-based modes, you can additionally define an optional **weekday filter** to prevent that pages are being shown on certain days of the week.

It is also possible to define an "**Annual Repeat Pattern**" which is great if you e.g. want to display birthday greetings on the screen.

When the "**Only Visible on Certain Player(s)**" mode is selected, the page will be only shown if the playlist is running on one of the selected player(s). Alternatively, you can also invert the filter and select only those player(s) on which the given page shall NOT be shown.

Access Restrictions

The "**Access Restriction**" of a page allows you to restrict the (interactive) access to that page by either requiring the user to enter a static password or by providing a list of accepted passwords/IDs that is stored in a plain text file. In combination with an RFID or bar code scanner, this feature can be used to allow tailored access to certain pages for specific users only. For more details, please see section "Protected Content" 155. This feature is only available, if the expert mode 44 is enabled.

Actions

For integrating special functionality, "**Actions**" are supported as well. Please see section Actions 121 for more information. This feature is only available, if the expert mode 44 is enabled.

Keyboard Shortcuts

It is also possible to define a keyboard shortcut 158 for a page (requires expert mode 44 to be enabled).

6.5.1.3 Display Duration of a Page

The display duration of a playlist page in *FrontFace* is determined by multiple factors. First of all, it is always possible to define an explicit duration for a page in the page settings dialog. In case no duration has been defined ("Automatic"), the default display duration from the playlist settings are used instead (which is by default 10 seconds (00:00:10)).

A special case is having a media object in a playlist page which has its own **"natural" duration** (e.g. video clips or embedded playlists). In this case the shortest duration of any media object on that page determines the duration of the whole page unless an explicit duration has been defined for the hosting page.

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The actual duration of a playlist page is determined by the following aspects in this order:

1. Is an explicit duration defined for the page? If yes, the page will always be shown for this time span.

2. Else, if the duration of the page is set to "Automatic" the default page duration which is defined in the playlist will be applied.

3. When the page does contain content which has a "natural" duration (e.g. video clips, embedded playlists, slide shows, etc.) the page will be shown until that content has been fully shown. In case more than one media object with a natural duration is used on a page the page will be shown until the "shortest" media object with a natural duration has been fully shown.

Notice: It is possible that a page is shown a bit longer than the defined duration in case the next page of the playlist contains media objects (e.g. huge videos) that takes some time to load. Instead of showing a blank screen, the previous page remains visible until the new page is ready to play.

Examples:

- A video (duration 2 min.) is embedded in a page where no explicit duration for this page has been defined ("Automatic"); in this case the whole page is shown for 2 min. (unless any special loop options have been set for the video!).
- A video (duration 2 min.) is embedded in a page with an explicit duration of 00:00:15 for this page; in this case the whole page is shown for 15 sec. which means that the full length of the video is not shown.

Notice: In case your playlist contains only one single page it does not have a duration, even if the duration of that single page is explicitly set. This means when a playlist with only a single page is shown, this page will never reload! In order to make the page reload, you have to create a copy of that page in the playlist so that the playlist has two identical pages. This special behavior also needs to be taken into account when embedding a playlist 148 into another one!

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6.5.2 Touch Menus

With *FrontFace* you can create, apart from non-interactive playlists 67, also **interactive kiosk applications** where users navigate a hierarchical menu structure and consume the provided content on a touch screen system. However, traditional input methods like mouse/trackball and keyboard are supported as well. Therefore, *FrontFace* can be used with a board range of kiosk terminals and interactive system types.

A **touch menu** represents a hierarchical menu structure made of menu buttons 75 and respective sub buttons that the user can navigate. Each button can either contain further sub buttons or any kind of content (media objects 86 like images, PDFs, videos, Web pages, etc.).

To edit a touch menu, click on the menu tree icon ( ) which is shown in the list item of the touch menu in the list of playlists and touch menus from the Content menu section 66 of the *Assistant*. When a touch menu is in "edit mode", you can add, delete or modify menu buttons by clicking on the +, - or edit icons. You can also right-click a menu button in the tree to open up the context menu that also gives you access to the most important commands in relation to menu buttons.

The settings 74 of a touch menu allow you to configure how the menu behaves when operated by a user (e.g., if content is played automatically when a user clicks on a button with content assigned to it) and how the menu looks like on the screen (e.g. the visual design of buttons, toolbars, etc.). You can open the settings dialog of a touch menu by performing a double-click on the list item of the touch menu or by clicking on the **"Edit"** button.

Notice: Since touch menus are require user interaction (touch screen or mouse/keyboard), please make sure that the screen 58 of the player 47 that you have configured in your project has the stetting **"Supports Touch Interactions"** enabled. Otherwise, the application will not react on any user interactions!

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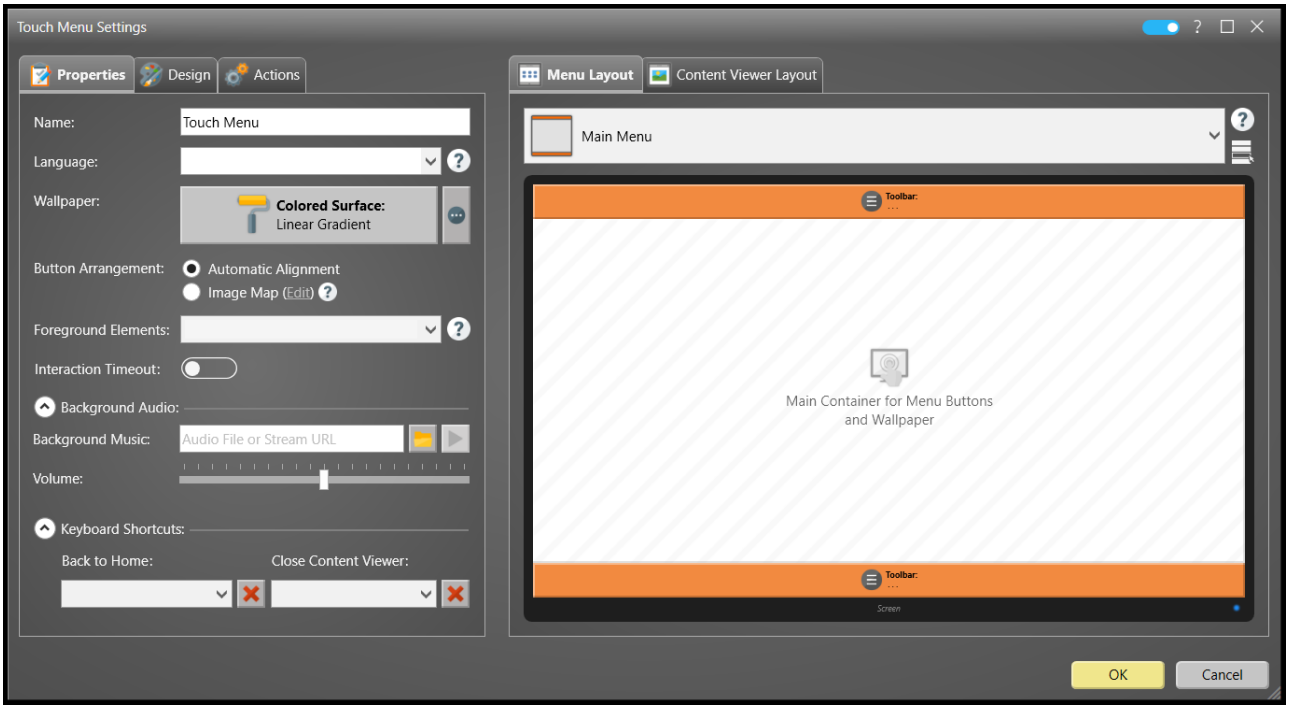
6.5.2.1 Touch Menu Settings



Dialog: Touch Menu Settings

The **language setting** defines the (master) language of the touch menu. This settings only needs to be configured if you want to create a multi-language touch menu 81.

The **wallpaper** defines the background for the area where the menu buttons are shown. You can select any media object type 86 here which allows to use not only images, but also videos, colors or even Web pages or PDF documents. For every menu level, the wallpaper media object can be overridden, if desired, by setting a different wallpaper media object in the settings dialog 75 of the respective menu button.

The child buttons for a touch menu can either be arranged automatically on the screen or completely custom by using an **Image Map** 77.

Similar to playlists 67, you can also define a **background music** for the touch menu. As with the wallpaper, you can override the background music for every menu level.

For a touch menu, an **Interaction Timeout** can be defined: This is the interval after which the system will return to the root menu level of the touch menu, if no more interaction by the user has occurred. This is very useful since if a user leaves the terminal without returning to the main menu. A subsequent user will then be able to start his navigation from root menu level and does not have to hit the "**Home**" button first.

In the tab "**Button Design**" you can select the visual theme for the menu buttons as well as several default settings for menu buttons such as color, font or font color & size. You can also define the

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button size in pixels. The button size also determines indirectly, how many buttons can be shown on the screen at once. If a menu level of your menu contains so many buttons that these do not fit on the screen at once, an automatic paging is activated which allows you to swipe through all the buttons of that menu level.

Finally, a touch menu has two layouts 82 assigned to it: The **"Menu Layout"** and the **"Content Viewer Layout"**.

The **"Menu Layout"** is used when the buttons of the menu 75 are shown (navigation). The main container of the layout holds the actual menu buttons. Apart from that, it can contain toolbar media objects 119 that provide functions like language switching or a **"Home"** / **"Back"** button.

The **"Content Viewer Layout"** is used whenever the actual content 79 is shown that has been assigned to a button. The main container of the **"Content Viewer Layout"** contains the content. Other containers in this layout may contain toolbar media objects 119 that provide functions for closing the content viewer or for navigating within the displayed content.

For integrating special functionality, **"Actions"** are supported as well. Please see section Actions 121 for more information. This feature is only available, if the expert mode 44 is enabled.

6.5.2.2 Menu Buttons

Menu Buttons represent the core elements of a touch menu 73.

Buttons can be arranged as hierarchy to create a multi-level navigation for the user. A button usually has an icon, a caption text and a color. Several other properties of a button can be configured as well such as font, font size and color. The visual design of the button itself is defined by the button theme 80 selected in the settings dialog of the touch menu 74. If neither, color, font, font size / color are defined for a button, the default values for these properties are used that are define in the settings of the touch menu.

The child buttons for a menu button can either be arranged automatically on the screen or completely custom by using an **Image Map** 77.

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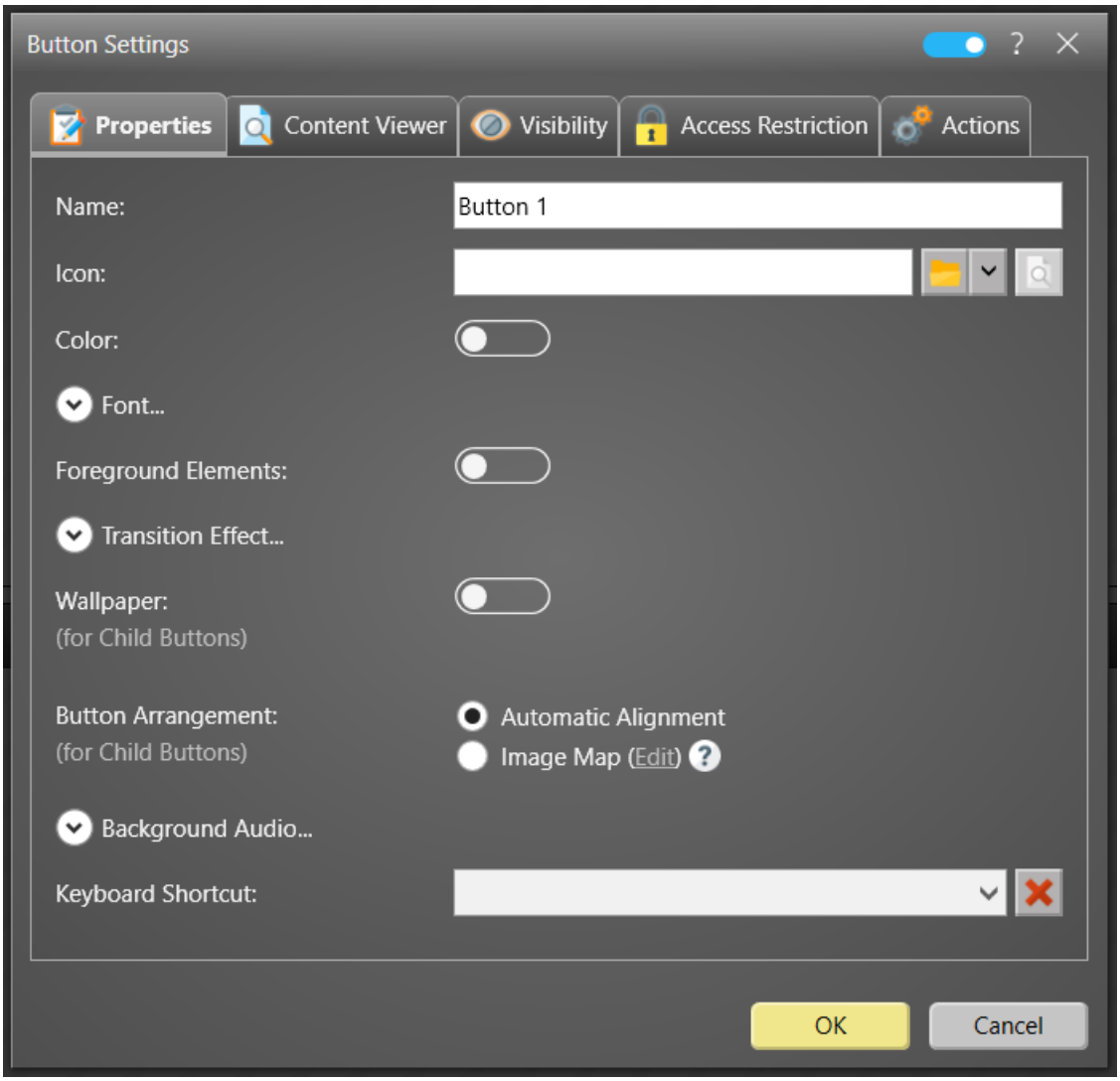

Dialog: Button Settings

Menu Button Visibility Settings

The menu button settings dialog also offers options to configure the "**Visibility**" of the menu button within the menu structure. A menu button can either be (always) visible, hidden (not shown in the menu), "**Only Visible within this Time Window**" or "**Only Visible on Certain Player(s)**".

The "**hidden**" status can be used to remove a menu button from a touch menu without deleting it (e.g., if you have prepared a menu button that needs to be activated very quickly or that serves as a template for other menu buttons by creating a copy of it on demand).

The "**Time-Window**"-based visibility lets you show/hide the menu button within the touch menu depending on the current date/time. There are three different modes for time-window-based visibility available: A **defined time-window** (from start date/time until end date/time), a **time-window with given daily start/end time** and a **pattern based on weekdays** (e.g. from Tuesday to Friday).

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For all time-window-based modes, you can additionally define an optional **weekday filter** to prevent that menu buttons are being shown on certain days of the week. It is also possible to define an "**Annual Repeat Pattern**".

When the "**Only Visible on Certain Player(s)**" mode is selected, the menu button will be only shown if the touch menu is running on one of the selected player(s). Alternatively, you can also invert the filter and select only those player(s) on which the given menu button shall NOT be shown.

Access Restriction

The "**Access Restriction**" of a menu button allows you to restrict the (interactive) access to that menu button by either requiring the user to enter a static password or by providing a list of accepted passwords/IDs that is stored in a plain text file. In combination with an RFID or bar code scanner, this feature can be used to allow tailored access to certain menu buttons for specific users only. For more details, please see section "Protected Content" 155. This feature is only available, if the expert mode 44 is enabled.

Paging Behavior

In the tab "**Content Viewer**" you can configure how the pages of that button (only if the button does not contain any sub buttons!) are going to be displayed. You can define a custom **Background Color** and choose **Enable Automatic Paging**. If **Enable Automatic Paging** is disabled (default), the user can interactively navigate the content pages of the menu button. On the other hand, if the automatic playback is active, the pages are automatically played in sequence, like in a normal playlist 67. If "**Repeat Count**" is set to "0", the content display automatically closes after all pages have been previously displayed. If a user intervenes while **Enable Automatic Paging** is active, it will instantly stop and the content display behave as if **Enable Automatic Paging** is disabled.

Actions

For integrating special functionality, "**Actions**" are supported as well. Please see section Actions 121 for more information. This feature is only available, if the expert mode 44 is enabled.

Keyboard Shortcuts

It is also possible to define a keyboard shortcut 158 for a button (requires expert mode 44 to be enabled).

6.5.2.3 Image Maps

The **Image Map** feature is an alternative representation of a menu level within a touch menu 73. Instead of buttons 75 that represent the sub menu items in the navigation, an image map shows a visual (e.g. a wallpaper image) that has touch-sensitive zones that the user can click on. A typical example for the use of an image map is a plan or a map of e.g. a theme park which shows different rides on which the user can click on to get further, detailed information.

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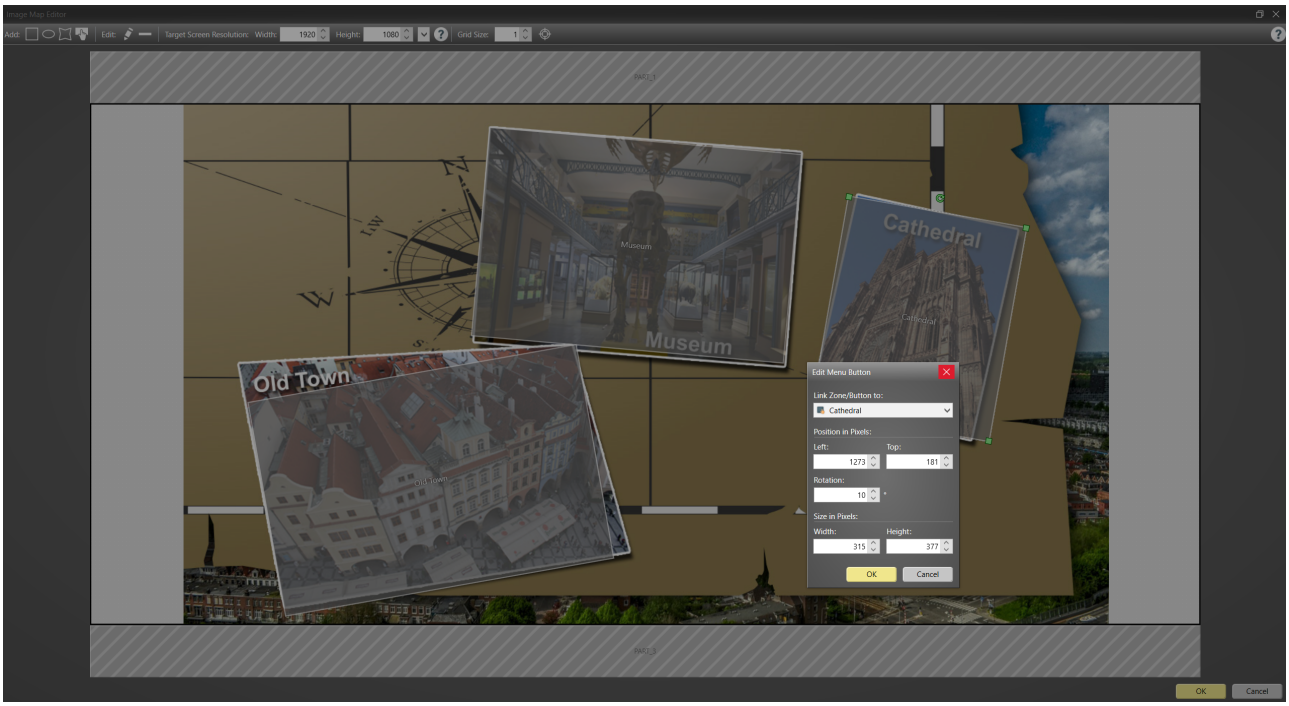

Image Map Editor

In order to create an image map, you must first define a background/wallpaper media object for the respective touch menu or the menu button. Although you can use any media object as a wallpaper, an image is typically used for image maps.

Important: Before you start creating the image map, you must define the **target resolution** of your screen in the **Image Map Editor** (e.g. 1920 x 1080 for full HD screens, landscape). If this differs from the actual resolution of the player, it may happen that touch-sensitive zones are not aligned in the previously defined positions on the wallpaper and navigating the menu by the user is therefore not possible.

An image map consists of touch-sensitive zones that trigger the same action when clicked as when clicking on a menu button (calling up a sub menu or displaying content). You must therefore link each zone that you create with one of the subordinate buttons of the touch menu or the menu button. Alternatively, an image map zone can also be used to trigger one or more actions 121. To do this, activate the Expert Mode 44 in the settings dialog of a zone and then select "**Execute Actions**".

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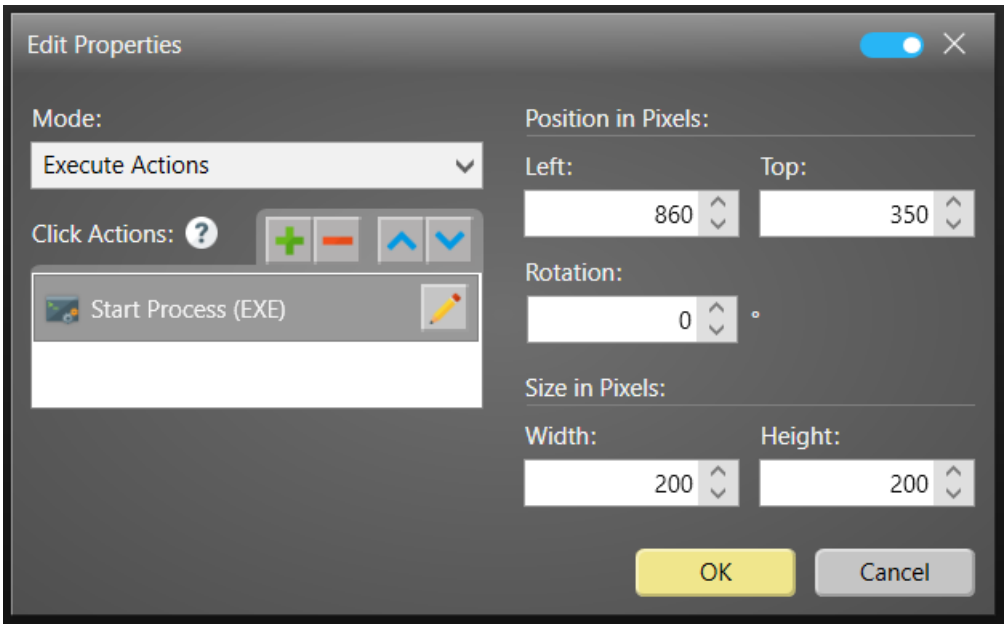

There are various shapes available that you can use to create a touch-sensitive zone:

- Rectangle
- Ellipse
- Freehand
- Button

All shapes can be moved, scaled or rotated as required. In the case of the "button" shape, the size is defined in the settings of the touch menu. The button looks exactly the same as in the case of automatically arranged buttons (without image map), but you can freely determine the position on the wallpaper.

6.5.2.4 Content Viewer

If the user clicks on a button 75 of a touch menu 73 that has no further sub buttons, the **content viewer** is displayed. The content viewer is the "frame" in which the actual content (media objects) is shown. The content of a menu button consists of at least one or multiple pages which makes it possible to e.g. include a slideshow with elements of different content types to a single menu button. Whether the pages are automatically rendered or need to be paged manually by the user depends on the content display settings made in the settings dialog of the respective menu button 75.

Since the content of a button can consist of multiple pages, the content viewer should present a toolbar that allows the user to navigate through the pages interactively. Another important element hosted in the toolbar 80 is the "**Close**" button which allows the user to close the content viewer and to return to the menu buttons of the touch menu.

The way the toolbar of the content viewer looks like and the functionality (toolbar buttons) that are provided is defined by the "Content Viewer Layout" 82 which is configured in the settings dialog of the touch menu 74.

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6.5.2.5 Toolbars

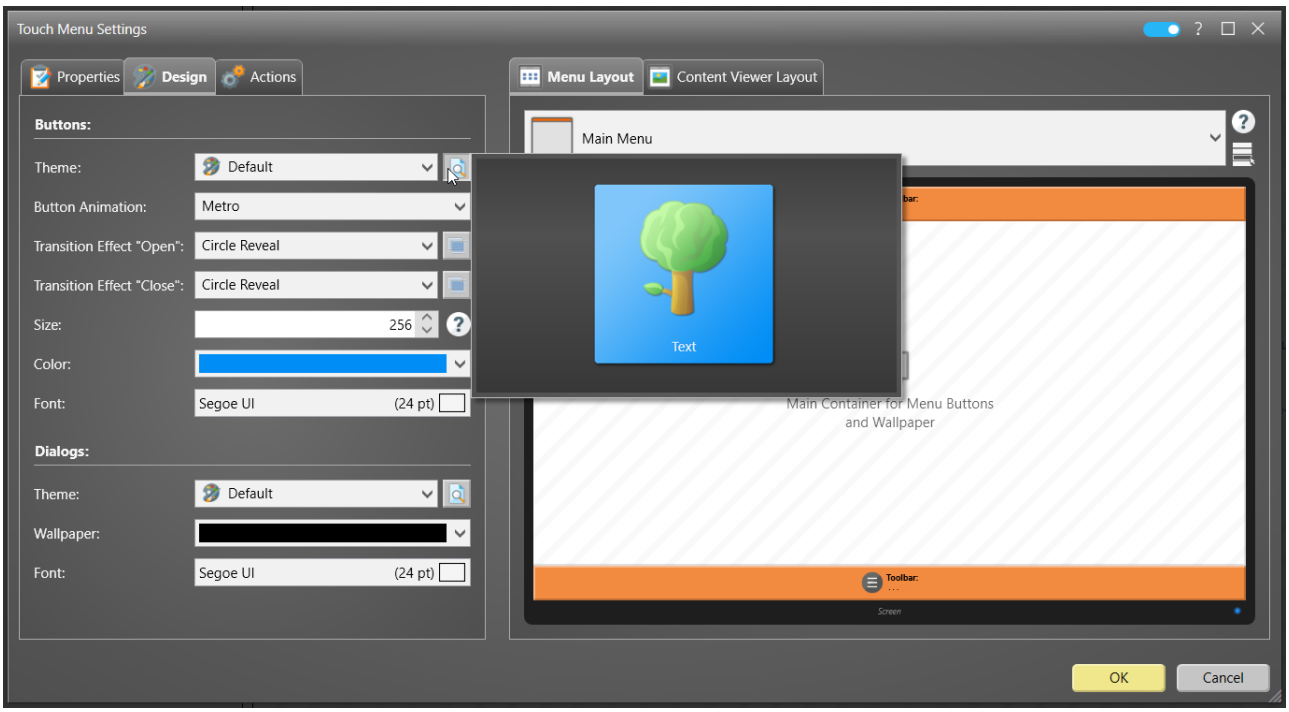
Since touch menus require some extra functionality apart from the menu buttons and the content, the **Toolbar media object** 119 is used to provide buttons and text elements that help the user to interact with the touch menu.

Typical functions that are provided on a toolbar are information about the currently displayed content or menu level (e.g. title text) or buttons that allow the user to navigate the content of the menu or to switch the language of the touch menu. But also other functions like toggling the onscreen keyboard 149 or printing/sharing 145 can be provided by buttons that are placed on a toolbar. For more information about the available functions that can be used, see the section "Actions" 121.

The toolbars in the Menu Layout 82 and Content Viewer Layout 82 can be customized to your needs. For more details on toolbars, please see the section about the Toolbar media object 119.

6.5.2.6 Button Themes

The way how buttons look like is defined by **button themes**. There are two different types of themes available: *button themes for menu buttons* and *toolbar button themes for toolbar buttons*.



The button theme for the menu buttons is selected in the settings dialog of the touch menu 74 while the toolbar button theme can be selected individually for every toolbar in the settings dialog of the respective toolbar media object 119.

FrontFace comes with a set of ready-to-use themes that should cover most design requirements. However, it is also possible to create custom button designs. For details on creating custom button themes, please contact mirabyte technical support 189.

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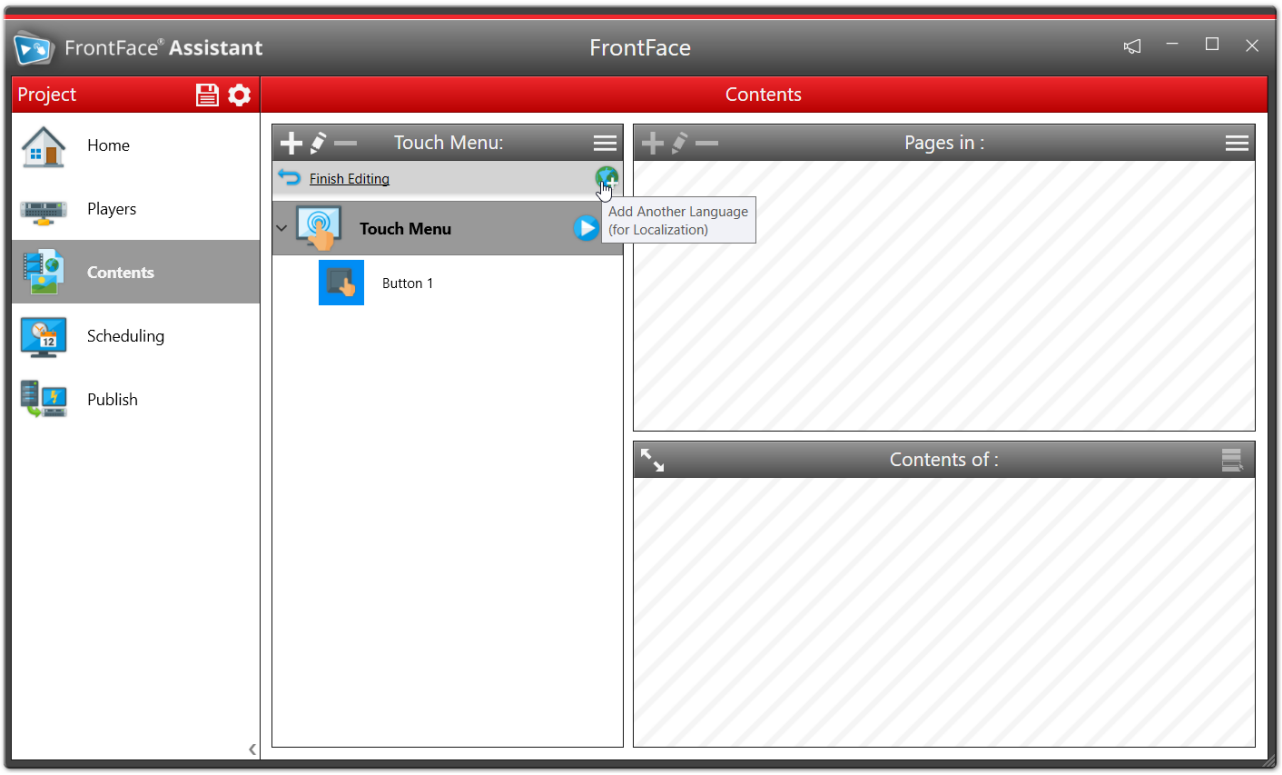
6.5.2.7 Multi-Language Menus

FrontFace also supports **multi-language touch menus**. You can select the (master) language of a touch menu in the settings dialog 74. By clicking on the "**Add Language**" icon ( ) when the touch menu is in edit mode, you can add additional languages. When creating a new language, you can choose if you want to create an empty touch menu or a copy of the master language touch menu that can then be used for direct translation.



Adding an additional language to a touch menu

It is important to understand that a language version of a touch menu is an entirely independent menu tree. Therefore, a language version can have totally different content and structure. This is e.g. helpful if you have mostly users that speak one language but also a few other users that speak a different language. Since translating the entire content to the second language would not be feasible from an economical perspective due to the small number of users, you can create a shorter version of the touch menu in the second language.

When the *Player App* is showing the touch menu, the user can switch between the available languages by clicking on the "**Change Language**" button in the toolbar. This menu automatically presents a list of available languages to the user.

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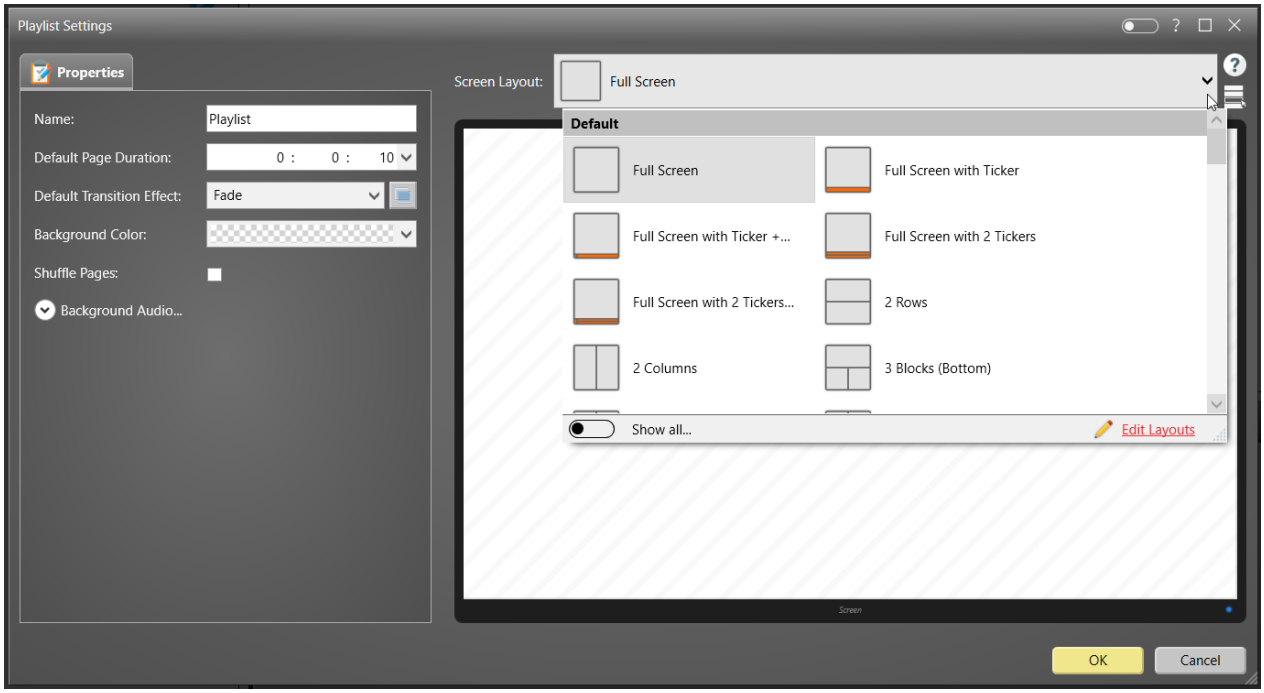
6.5.3 Layouts

The way how the actual content (images, videos, Web pages) is positioned on the screen and how the screen is partitioned is defined by so called **"Layouts"**. These templates exist in two different flavors:

⇨ Screen Layout (defined per playlist or touch menu):

- **Playlist:**
  On the one hand you can select a *screen layout* for every playlist. This template remains the same for the whole time the playlist is shown and defines static media objects such as a news ticker or a station logo (as seen on TV channels). One container in the screen layout, which is referred to as the **"Main Container"**, does not host a media object but is used for displaying the actual pages of the playlist. So the screen layout serves as a "frame" for the pages within the playlist.



- **Touch Menu:**
  For touch menus, two *screen layouts* have to be selected: The *"Menu Layout"* and the *"Content Viewer Layout"*. The *"Menu Layout"* is used when the hierarchical button menu is shown and the *"Content Viewer Layout"* is used to display the actual content of a button.

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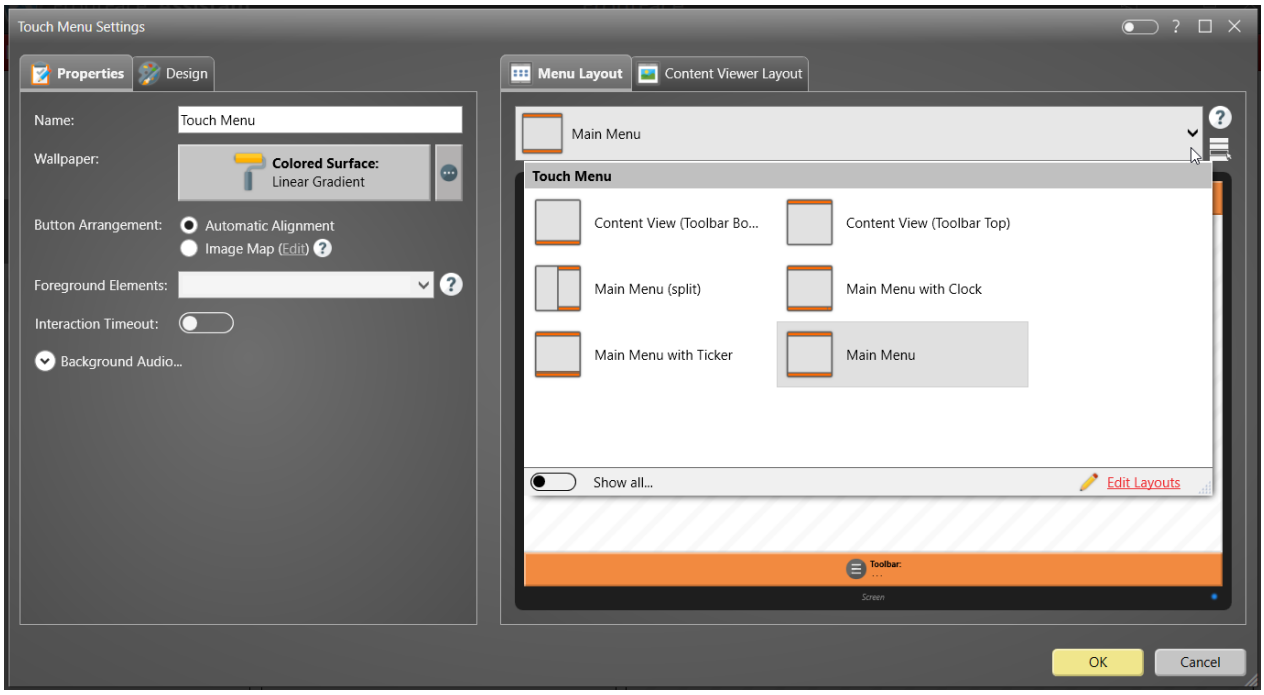
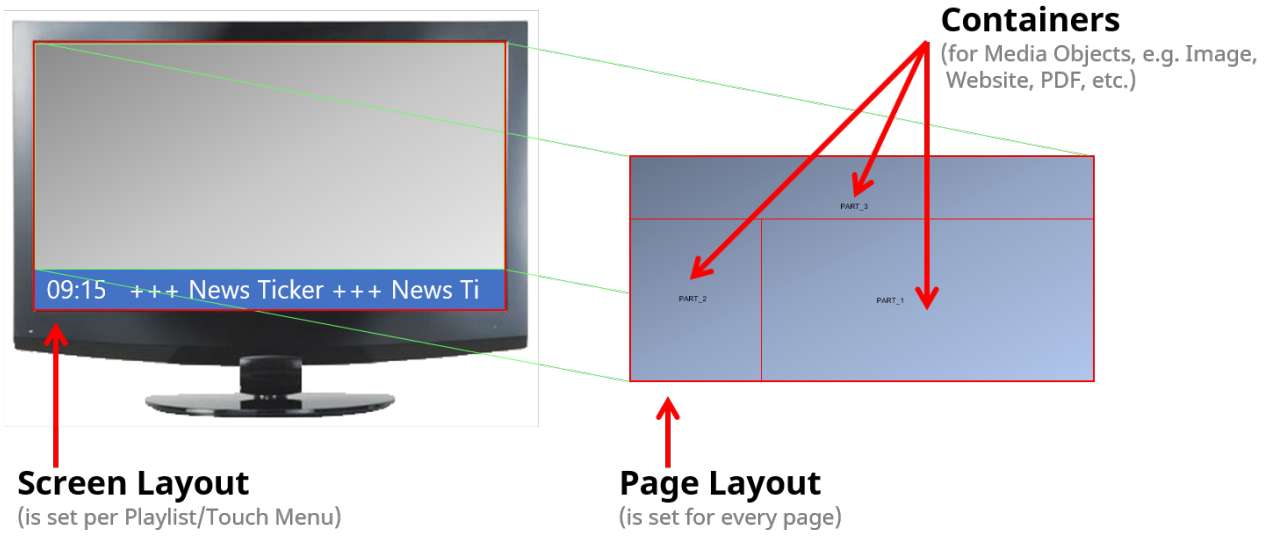


⇨ Page Layout (defined per page):

On the other hand you have to assign a *page layout* to every page of a playlist. A page layout basically defines how the screen is partitioned and allows you to display more than one media object on a single page. The basic page layout ("**Fullscreen**") contains just one container for a single content which is then displayed in full-screen mode. You can choose from the set of predefined page layouts that come with *FrontFace*. Specifically the **"Overlay Layouts"** (see Overlay Layouts 143) offer interesting design options. Additionally, you can also define your own, custom layouts (see section Custom Layout Creation 84). A page layout always consists of at least one or multiple containers that can then be "filled" with **media objects** 86 (="content").

The following diagram visually shows how screen and page layouts work together:



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Furthermore, it is also possible to embed another playlist in a container of a page layout. This can be used to make certain parts of a page static while others contain dynamic content (see Embedding Playlists in other Playlists 148).

Please also see the section about Overlay Layouts 143 for more information.

6.5.3.1 Custom Layouts

Apart from the built-in layouts that shipped with *FrontFace*, you can also create your own custom layouts from scratch or modify the existing layouts to suit your individual needs.

In the drop down menu for page or screen layouts, you can click on "**Edit Layouts**" to open the **layout editor**.

In the layout editor you can select an existing layout to start with or create an empty one from scratch.

You have to define the desired screen resolution for a layout (1920x1080 is the default resolution). A layout may also be used with different screen resolutions or orientations than the desired one but at least for the layout editor the desired screen resolution is used to define the size of the "canvas" on which you can arrange the containers.

The size and position of a **container** can be set using different properties:

- **Left Margin**
- **Top Margin**
- **Right Margin**
- **Bottom Margin**
- **Height/Width**

All of these properties can either be given as **absolute values (in pixel)** or as **relative values (in %)**. Relative values are based on the area of the screen where the layout actually fills in. Some of the properties cannot be used in combination: E.g. it is not possible to define left and right margin in combination with the width of a container. At least one of these properties needs to be left undefined. The values of the properties and the units (px/%) can be set in the container properties dialog or by dragging/resizing the container.

Containers are arranged in a specific order. Containers may overlap or even entirely cover each other. This is helpful if you want to create content with media objects that support transparency (such as text or PNG images). The container order is shown in the list next to the canvas of the layout editor. The order can be changed by using the arrow buttons in the toolbar of the layout editor.

A layout can be flagged as either "**Screen Layout**", "**Screen Layout (for Menus)**", "**Page Layout**" or simply as "**Layout**". If the latter is selected, the layout can be used both as screen and as page layout.

At least one container has to be selected as "**Main Container**". In case of screen layouts, this is the container that actually holds the sequence of playlist pages. If the layout is used for a touch menu, the

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main container either holds the menu buttons that the user can navigate (*"Menu Layout"*) or the actual content pages (*"Content Viewer Layout"*). In case of page layouts, the main container has no meaning and is treated like any other container.

Containers can be empty or pre-filled with a media object. Empty containers can later on be filled with media objects by the user when e.g. creating a playlist page. Containers with pre-filled media objects can be changed by the user but not cleared or filled with a different type of media object than the pre-filled one.

Important: You should only add predefined media objects to a container if you plan to reuse the layout e.g. for multiple playlists or touch menus. If you only create an individual layout for a single playlist or a touch menu, you should always leave the containers in the layout editor EMPTY. When you select the layout in the properties dialog of the playlist or the touch menu you can then fill the containers with the desired media objects!

If you create a custom layout, this layout is saved within the project and is only available inside the project.

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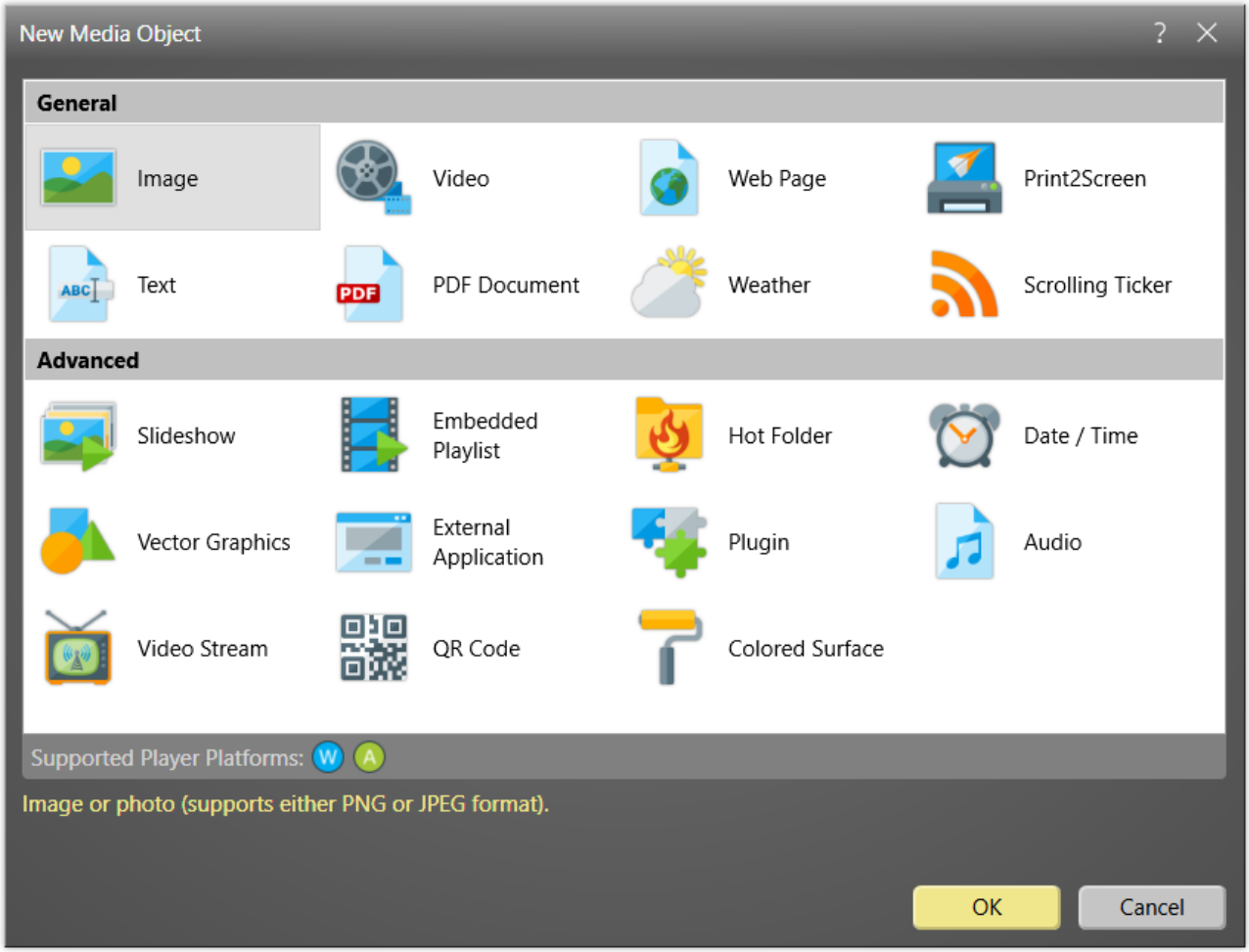
6.5.4 Media Objects

Media Objects represent the actual content that is displayed on the screen inside playlist pages (e.g. images 90, videos 91 or text 100).

You can see whether a media object is supported by the desired target platform (e.g. Windows or Android) in the **Media Object Selection Dialog** using the symbols W and A below the selection:



Media Object Selection Dialog

Every container of a screen or a page layout may contain a single media object. Depending on the type of media object that you select, there are different settings available that need to be configured.

Settings that all media objects have in common:

- **Stretching**
  The container that holds the media object has a certain size and aspect ratio on the screen. The selected stretching method defines how the media object is scaled and aligned in order to fit into the container rectangle. The following stretching methods are available:

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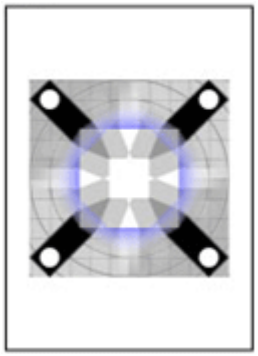
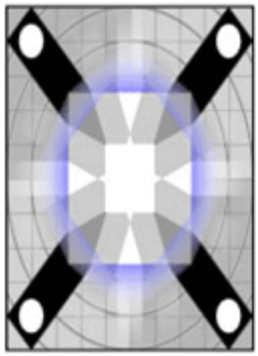


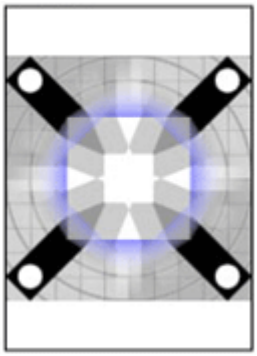
None

No scaling or fitting is applied. If the media object is larger than the container view port, it will be cropped.



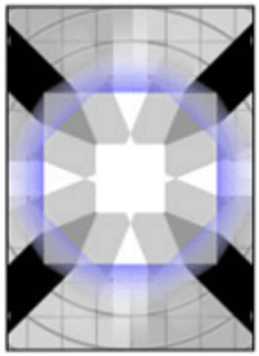
Fill

The media object is fitted into the container view port without taking care about the aspect ratio of the media object. As a result the media object may look stretched.



Uniform

The media object is either scaled up or down to fully fit into the container view port while maintaining the aspect ratio of the media object.



Uniform to Fill

Similar to "Uniform" but in this case it is made sure that the entire container view port is filled by the media object without leaving empty areas. As a result, the media object may be either horizontally or vertically cropped.

- **Style**
  Media objects are inserted in a layout 82 in predefined areas, which are called "containers". Various design settings can be applied to the media object itself or to its container (background color, padding, border and shadow/shine). The "Apply to container" check box can be used to specify that the selected settings are not to be applied to the media object itself, but to the surrounding container. For example, in the case of a media object of type "Image", which is to be provided with a shadow, you can specify whether the image itself should cast the shadow or the frame surrounding the image (incl. inner border padding, if applicable).

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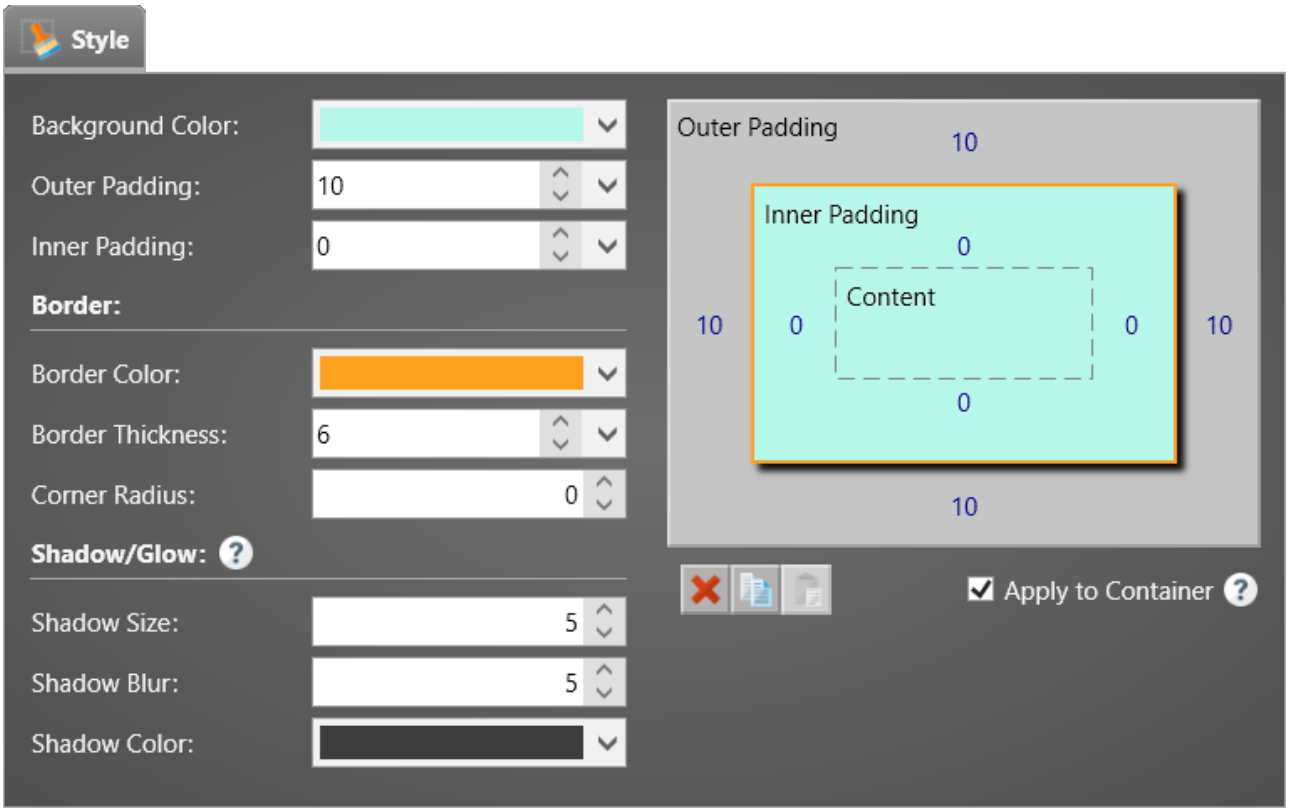

- **Background Color**
  By default, the background color of a media object is transparent. It is possible to specify a user-defined color or even a gradient as background. For the "Text" media object, setting the background color is usually required (e.g. for black text on a white background).
- **Padding**
  Two margin distances can be defined: Inner and outer padding. The outer padding defines the distance in pixels between the edge of the container and the border of the media object. The inner padding is the distance in pixels between the media object and its surrounding border. If the values is set to "0", the media object can claim the whole space of the container. It is also possible to define the spacing for all sides (left, top, right and bottom) equally or for each side separately. Just click on the drop-down menu of the padding input control to set the values for each side separately.
- **Border**
  The border puts a frame around the media object and has a color or a gradient and a line thickness. Optionally rounded corners can also be defined.
- **Shadow/Glow**
  Provided that at least the background color and an out padding that provides sufficient space are defined, a drop shadow can also be applied to give the impression that the media object is "hovering" above the background. If the shadow size is set to "0" and shadow blur is set to a value greater than "0", it is also possible to create a "glow" effect. Please note that the excessive use of the Shadow/Glow feature on players with low graphics performance can lead to performance degradation!

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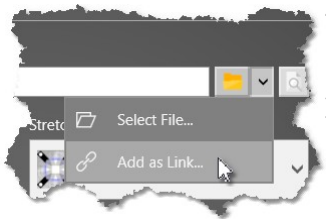
File Management:

By default, when you select a file in a media object settings dialog (e.g. an image file, a PDF or a video file) the file is physically copied into the project. Media object files are stored in the projects's Media Library 120. When publishing 130, the file is copied automatically to the player(s).

Apart from this method of adding content to a project, you can, alternatively add content files as a "**symbolic link**". In this case, the file is not added physically to project. This however, requires that the file is also available on the player under the same path/file name. A typical use case, where a symbolic link instead of a physical copy of a content file makes sense is files that are centrally stored on a file server and which are updated frequently. By integrating such as file as symbolic link using the UNC network path to the file, allows updating the file at any time without having to (re)publish the project. As a downside, the file is accessed every time it needs to be displayed by the player and therefore causes constant network traffic. Another option to add even multiple files in a similar way is the Hot Folder 135 media object.



To add a file as symbolic link, the expert mode 44 needs to be enabled first. In expert mode, the button to select a file is displayed as split button where you can select from a drop down menu if you want to select a physical file or "**Add as Link...**".

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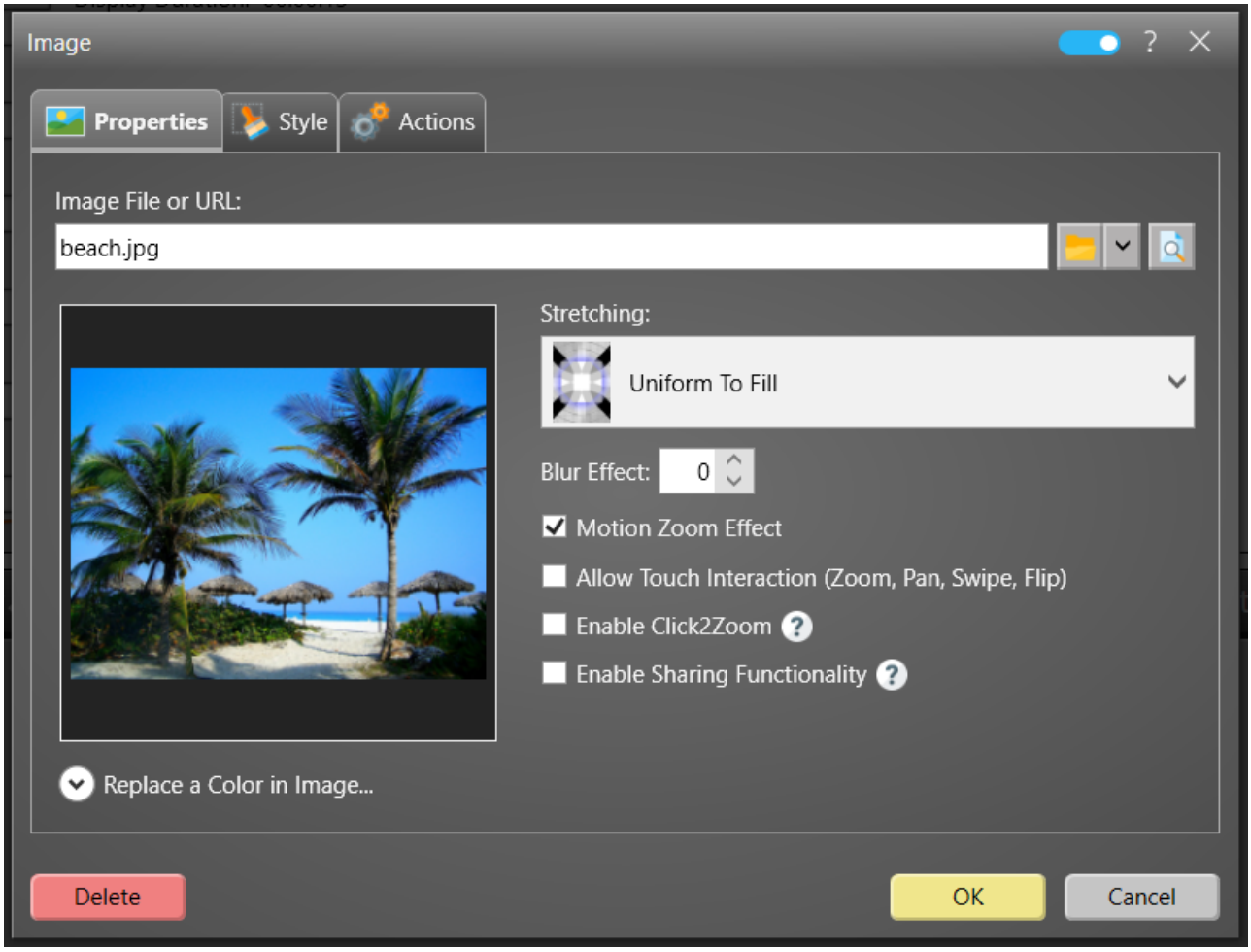
6.5.4.1 Image

FrontFace supports any **"Image"** or picture in PNG or JPEG format. PNG graphics may also use transparency.



Settings Dialog: Image

You can optionally enable the **Motion Zoom Effect** for images which makes the image zoom and pan continuously on the screen to add a nice motion effect. This way even static photos can look like camera pans.

It is also possible to enable a **Blur Effect** (0..100%) to make the image look blurry. This option is intended to be used when the image is set as background image and other media objects (e.g. Text) are placed on top of the image.

It is also possible to select a color from the image to be replaced with another, custom color at runtime. This is helpful if you are using images as artwork elements (such as frames or arches) that contains areas that are filled with the same color that need to be matched with other elements on a page in regards to colors. To easily select the source color that is supposed to be replaced, you can

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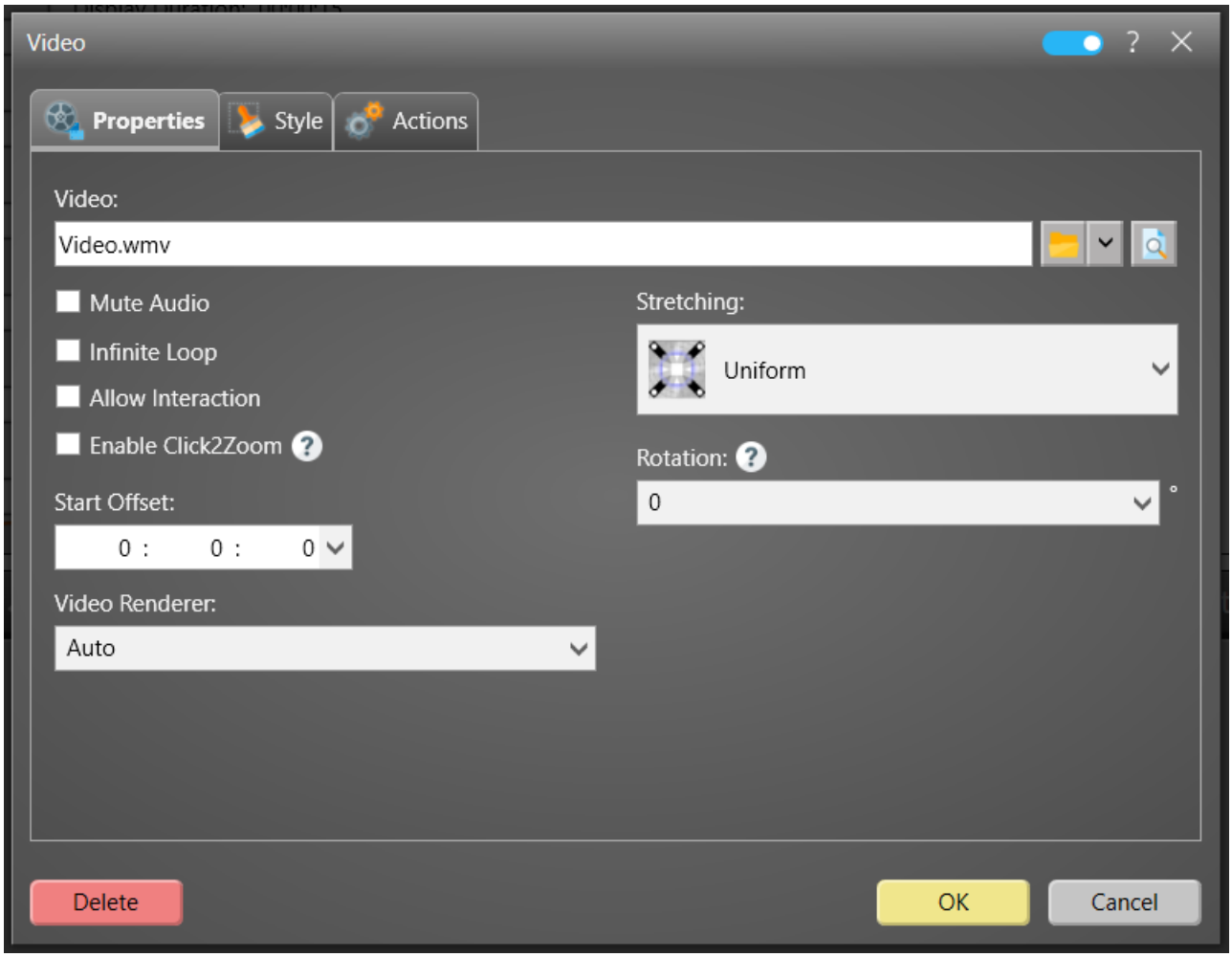
click on the thumbnail preview of the image in the image settings dialog which will select the color of the pixel under the mouse pointer.

Optionally you can also enable **touch interactions** (zoom/pan) for the image.

6.5.4.2 Video

All common **"Video"** formats are supported (**MP4**, **WMV**, **MOV**, **AVI**, etc.). It is recommend to install an appropriate codec pack such as **LAV Filters** 165 on the systems where the *FrontFace* software is used.



Settings Dialog: Video

A video, by default, has a natural length (see section Determination of the Duration of a Playlist Page 71 for details). By selecting the **"Infinite Loop"** option, the video is played in an endless loop and loses the natural length property.

You can mute the audio track of the video (if any) by selecting the **"Mute Audio"** option.

In case of a failure during playback, it is possible to automatically try to recover if the option **"Auto Recover on Failure"** is selected.

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An optional "**Start Offset**" can be set if you want the video not to start right from the beginning but from another point of time.

If required, the video can also be rotated by using the "**Rotation**" option. This is useful e.g., if the video was filed in portrait mode using a smart phone and the actual orientation is only stored as meta data in the video file. As a result the video would normally appear rotated. By applying a rotation, you can compensate this.

By activating the "**Allow Interaction**" option, a user can pause, continue, rewind or seek within the video using a touch screen. When touching the video while it is running, the video is paused and the controls for interacting with the video appear on the screen. When using a video in a touch menu button 75 and the "**Content Auto Play**" option is not enabled while the "**Allow Interaction**" option of the video is checked, the video will not start automatically, but the user will have to click on the playback control to start the video.

The "**Video Renderer**" option allows you to control how the video is played. If "**Auto**" is selected, the best playback method that is available on the player will be selected. In case of "**DirectShow**", the installed video codecs (e.g. *LAVFilters*) are being used. When choosing "**Windows Media Foundation**", the integrated video sub system of Windows is used that is also used by *Windows Media Player*. We only recommend this option if you experience any issues with video playback since performance and compatibility are not that good as with the video codecs such as *LAVFilters*.

6.5.4.3 Audio

All common **"Audio"** formats are supported (**MP3**, **WAV**, **WMA**, etc.). An audio file can be played interactively which allows the user to pause, play, rewind or seek within the file or it can be used in an unattended mode where the user does not interact with the media object.

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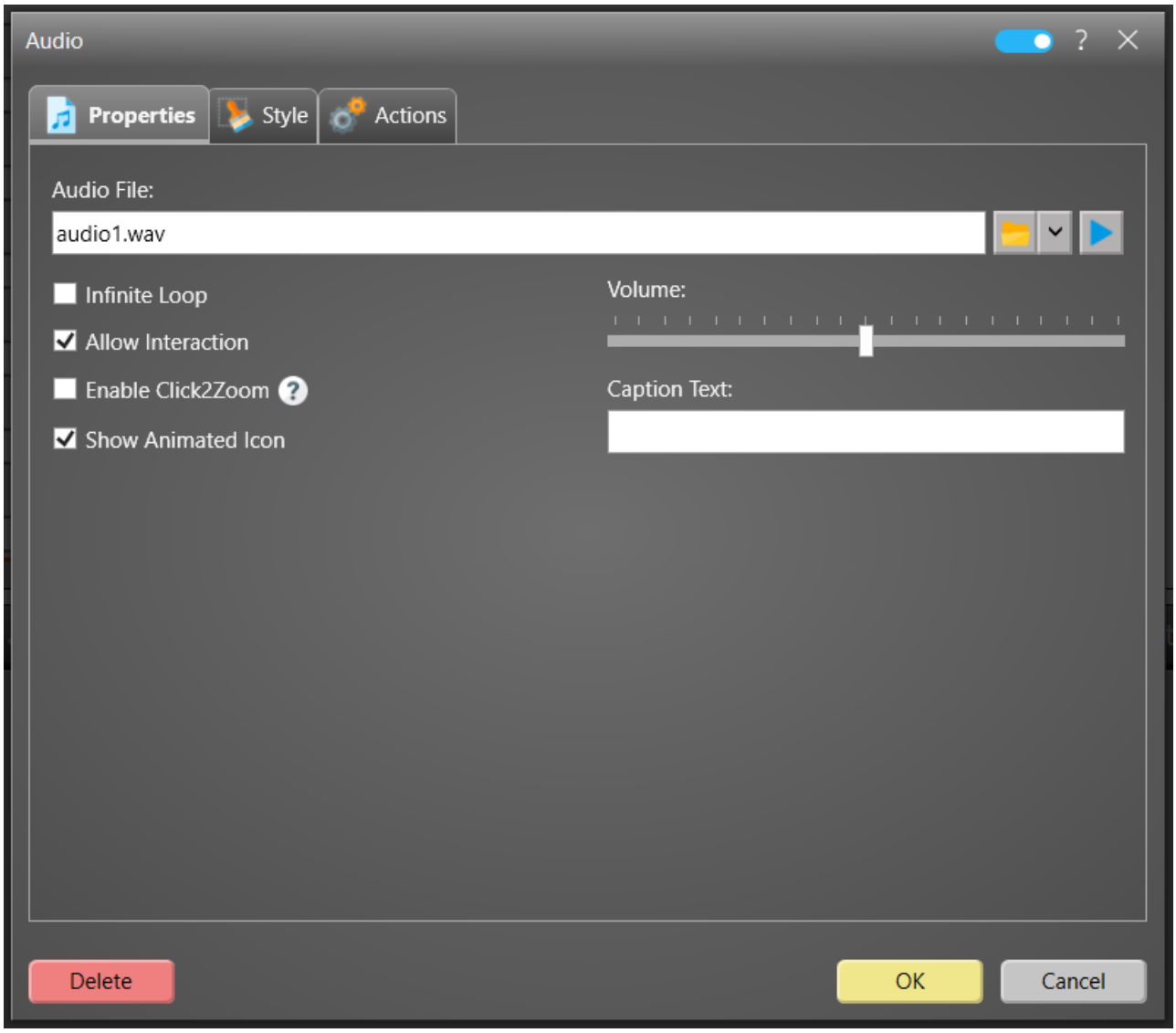

Settings Dialog: Audio

An audio file, by default, has a natural length (see section Determination of the Duration of a Playlist Page 71 for details). By selecting the "**Infinite Loop**" option, the audio file is played in an endless loop and loses the natural length property.

You can also set the "**Volume**" of the audio file on a percentage scale.

By selecting the "**Show Icon**" option, the media object will display an icon that visualizes the audio file to indicate to the user that this is an audio playback (especially for use within Touch Menus!). In addition to that, you can also enter a custom text that is displayed (e.g. the title of the audio track that is playing). The font family, size and color can be adjusted, too.

Another option to play audio files is to use the "Background Music" 147 setting which is available for playlists, touch menus and pages.

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6.5.4.4 Web Page

FrontFace supports the integration of HTML5/CSS3-based "**Web Pages**". You can choose between three different browser/rendering engines to display Web pages:

- **Auto**
- **Chromium**
- **Chromium (Overlay)**
- **Internet Explorer**

The "**Chromium**" engine uses a Chromium 64/32 bit based browser engine and fully integrates with other media objects; this also includes support for transparency and overlays. The Chromium engine requires a slightly more powerful player system due to the complete integration into the *FrontFace* rendering pipeline. The "**Chromium (Overlay)**" engine in contrast uses an overlay to render the Web pages like the normal Chromium browser. This gives a better performance but the downside is that this engine does not integrate with other *FrontFace* media objects in page layouts and does not support page transition effects.

The "**Internet Explorer**" engine uses the version of the Internet Explorer that is currently installed on the player system (usually Internet Explorer 11). It is only recommended to be used for legacy Web pages.

There is also an option "**Auto**" available that will select the best-suited browser engine depending on the current use of the Web Page media object. If the media object is shown within a normal playlist 67, the browser engine "**Chromium**" is used. If the media object is shown within a touch menu 73 the "**Chromium (Overlay)**" engine is used.

For an overview of the supported features of the Chromium browser engine used by *FrontFace*, please see https://html5te.st/46ec2f648cf5d00d.

The **Web Page** media object supports two different modes: By default, you can enter a **URL** of a web page that is supposed to be shown. Alternatively, when "**Expert Mode**" 44 is enabled, you can switch to "**HTML Widget**" mode, where you can directly enter HTML code. This is intended for HTML widgets (HTML snippets) that you want to integrate in your pages. Please note that always the code of a complete HTML document must be provided!

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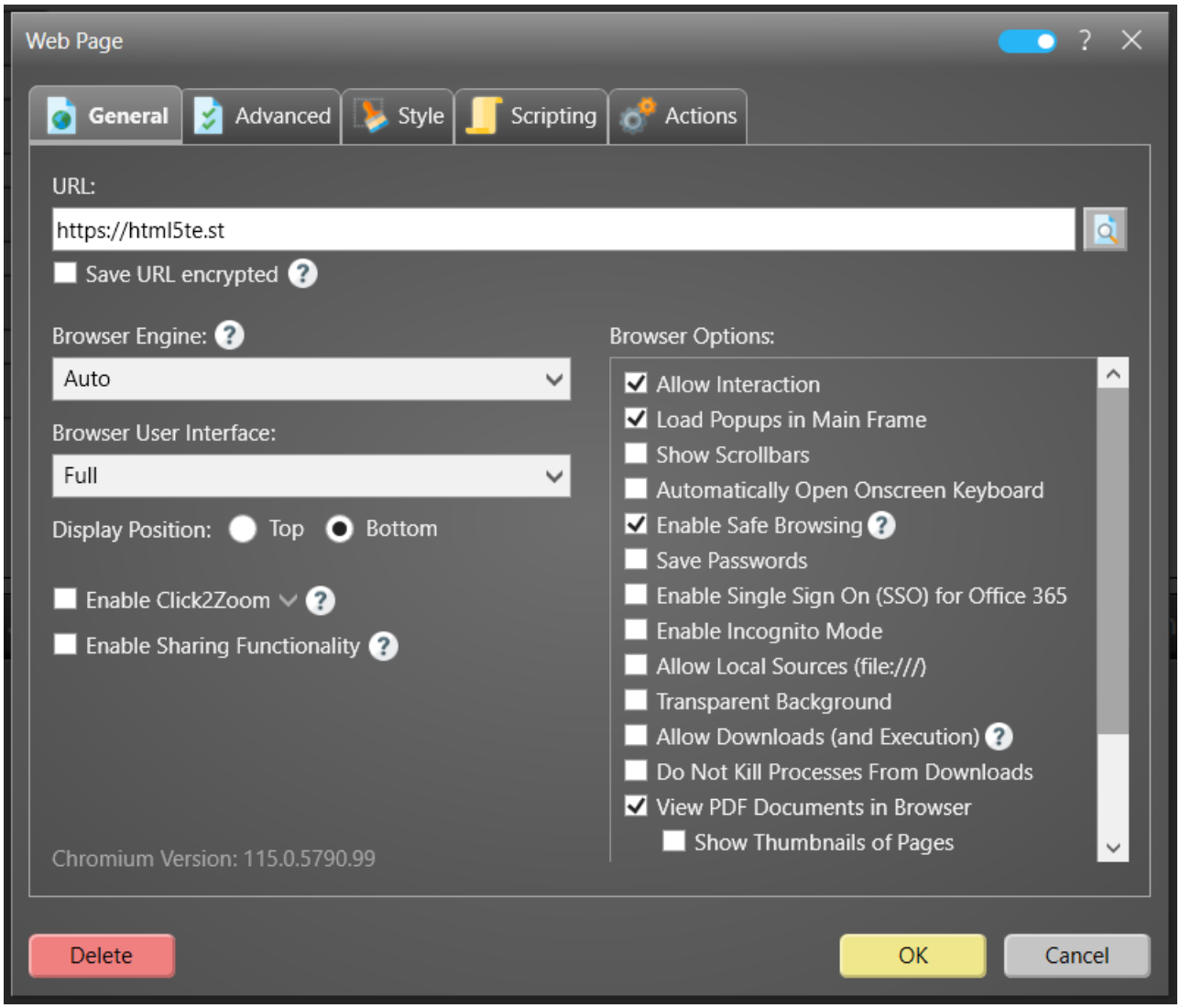

Settings Dialog: Web Page

URL

Specify the URL/web address that is to be displayed. The "**Save URL encrypted**" option (only available in expert mode 44) can be used to specify that the stored page URL is stored encrypted in the project and transferred encrypted to the player. This setting is recommended if you include so-called sharing URLs. These are URLs that contain an access token in the address that allows access to the page that would otherwise only be available with a valid login. Sharing URLs are typically used to integrate Office 365, Power BI, Google Docs or other web services.

Interaction

Normally, you cannot interact with a Web page that is shown on the screen. If the check box "**Allow Interaction**" is selected, you can use a touchscreen, mouse or keyboard to interact with the Web page. Please make sure that you also configure the screen 58 of your player to support interaction (= touchscreen)!

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Automatic Reloading

If you display a Web page permanently on the screen and want to perform a reload/refresh of the page, you can define a **reload interval**.

Zooming and Scaling

To adjust the Web page content for large screens or to match with other media objects on the screen, a **zoom factor** can be applied.

Automatic Scrolling

Web pages that are to large for the view port on the screen can be made to scroll automatically (vertically). You can define a **scroll speed** (the higher the value, the slower the scrolling speed, so "1" is the fastest speed!), a **step distance** (number of pixels to scroll on each scrolling event triggered by the defined scroll speed) and a **pause** between the change of the scrolling direction. On some web pages (e.g. using frameworks such as Bootstrap 5) it may be required to reduce the scroll speed and to increase the step distance in order to make automatic scrolling work correctly.

Authentication

Authentication for Web pages is supported as well, but by default only *Basic Authentication*. *Forms-based authentication* methods can be used as well, but do require some JavaScript programming (see "Web Page Scripting" 152 for details!). Furthermore, the authentication feature is only available for the Chromium browser engine, not for the Internet Explorer browser engine. In case of the Internet Explorer, you can add the user name and the password the URL using the following syntax: `http://username:password@example.com/`
Alternatively, also *client certificate authentication* is supported. This requires to install the client certificate that is used to authenticate on the player PC. The fingerprint of the certificate has to be provided in order to allow the browser to select the certificate upon establishing a SSL/TLS connection with the server.

The Chromium browser engine also supports **IWA (Integrated Windows Authentication)** using Negotiate and NTLM challenges. In the player settings 61 you can provide a whitelist of servers for the integrated authentication.

An optional Single Sign On (SSO) 168 feature is also available for Office 365. If this option is enabled, an automatic login to Office 365 websites (e.g. SharePoint Online) takes place, provided a Single Sign On based on Azure AD is set up.

Download of Files, Displaying PDF Files and Security Features

Normally, downloads of files are blocked by *FrontFace* if the option **"Enable Safe Browsing"** is selected (default). Besides blocking downloads and potentially dangerous files (e.g. EXE, ZIP, RAR, MSI, etc.), the safe browsing mode also blocks all file upload functions and other security-critical browser functions. If desired, displaying PDF files in the browser can be activated (option **"View PDF Documents in Browser"**). If, on the other hand, the download of files such as documents is to be allowed, this can be

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activated via the "**Allow Downloads (and Execution)**" option. In this case, the file will be launched after the download with the application that is registered on the system for this file type. This poses a potential security risk because the application that is then executed is beyond the control of *FrontFace*.

Video & Audio Playback

The Chromium browser engine of *FrontFace* supports the playback of video/audio files and streams using the following codecs: AV1, FLAC, MP3, Opus, Theora, Vorbis, VP8, VP9, WAV, WebM.

Notice: For patent and licensing reasons, videos with the following codecs **cannot** be played: H.264, AAC.
However, this **only** affects video playback in *FrontFace*'s Chromium browser! When using the normal media object Video 91, H.264-encoded videos can also be played, provided that an appropriate codec 165 is installed.

Transparency for Web pages

FrontFace does also support transparent Web pages (Web pages that have a transparent background color), but only with Chromium engine. If combined with "Overlay" page layouts 143, you can create really interesting visual effects. Therefore, you have to set the background color of your HTML page to transparent/nothing and the check box "**Transparent Background**" needs to be selected in the list of browser options. Here is an example how a HTML page can be made transparent using the following CSS rule:

Code Example:

```
BODY {

   background-color: transparent;

}
```

Cookies, Caching, and Browser Instances

Each web page media object creates a completely isolated instance of the Chromium browser engine. While this is relatively resource-intensive on the one hand, it also allows a clean separation of content and a particularly high level of security. Accordingly, cookies and cached files of a web page media object are by default (see below) not available to other web page media objects. The "**Clear Cache & Cookies**" option allows you to specify whether cache and cookies should be purged after a web page media object is terminated, or whether they should be preserved. By default, the caches & cookies of all Chromium instances are also cleared when the FrontFace Player App is started. If you do not want this, you need to disable the "**Clear Chromium Browser Cache Folder on Startup**" option in the advanced player settings 61.

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Notice: In the "**Advanced**" tab you will find, among other things, the "**User Data Persistence ID**" option. This is a random string that uniquely identifies a Chromium browser instance. Within an instance, settings, user data, cookies, cache, logins, etc. are isolated. Multiple web page media objects may not be active at the same time which have the same "user data persistence ID" set. Otherwise, an error will occur. Basically, web page media objects should only have the same ID if it is intended that they should "share" settings, cache and cookies.

Apart from the individual settings that you define for every Web page that you integrate into *FrontFace*, there are also some global Browser-related settings in the list of player settings 61.

6.5.4.5 Print2Screen

"Print2Screen" is a unique feature of *FrontFace* that allows you to integrate content from any Windows application that supports printing (such as Word, Excel, PowerPoint, etc.). *FrontFace* installs a virtual printer that serves as link between the application and the *FrontFace Assistant*.

For more details, please see the section Print2Screen 134.

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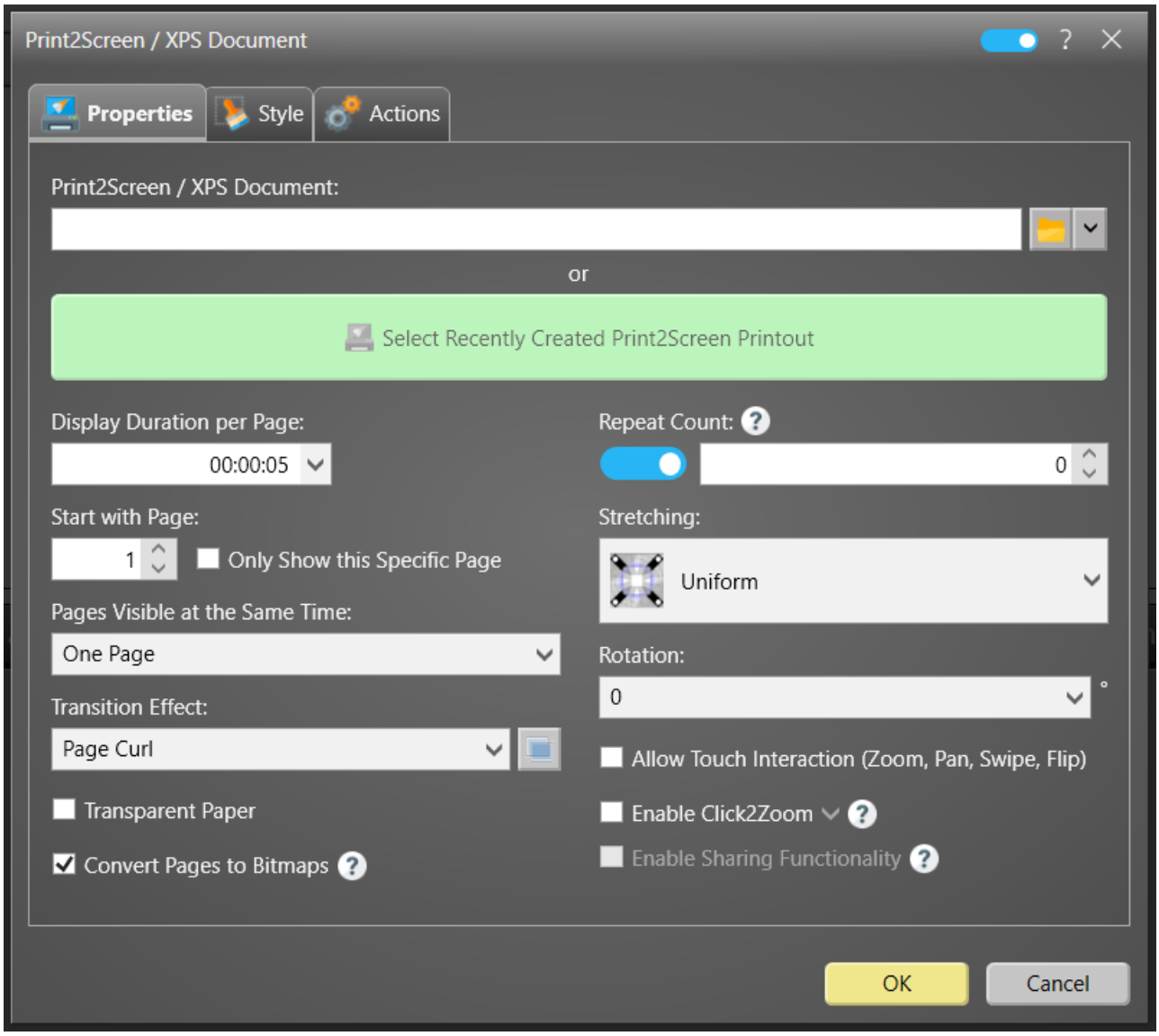

Settings Dialog: Print2Screen

Some of the options that you can set for *Print2Screen* media objects (such as page timing and the transition effect for turning pages) are equivalent with the options you can define for PDF documents 101.

You can use the **"Pages Visible at the Same Time"** setting to specify whether more than one page of the document should be displayed. This allows 2-3 pages to be displayed either next to each other or on top of each other.

If Expert Mode 44 is activated, you can also specify a start index (**"Start with Page"**) that determines which page of the document should be displayed first. If the **"Show this Page Only"** option is activated at the same time, there is no automatic "paging" for multi-page documents.

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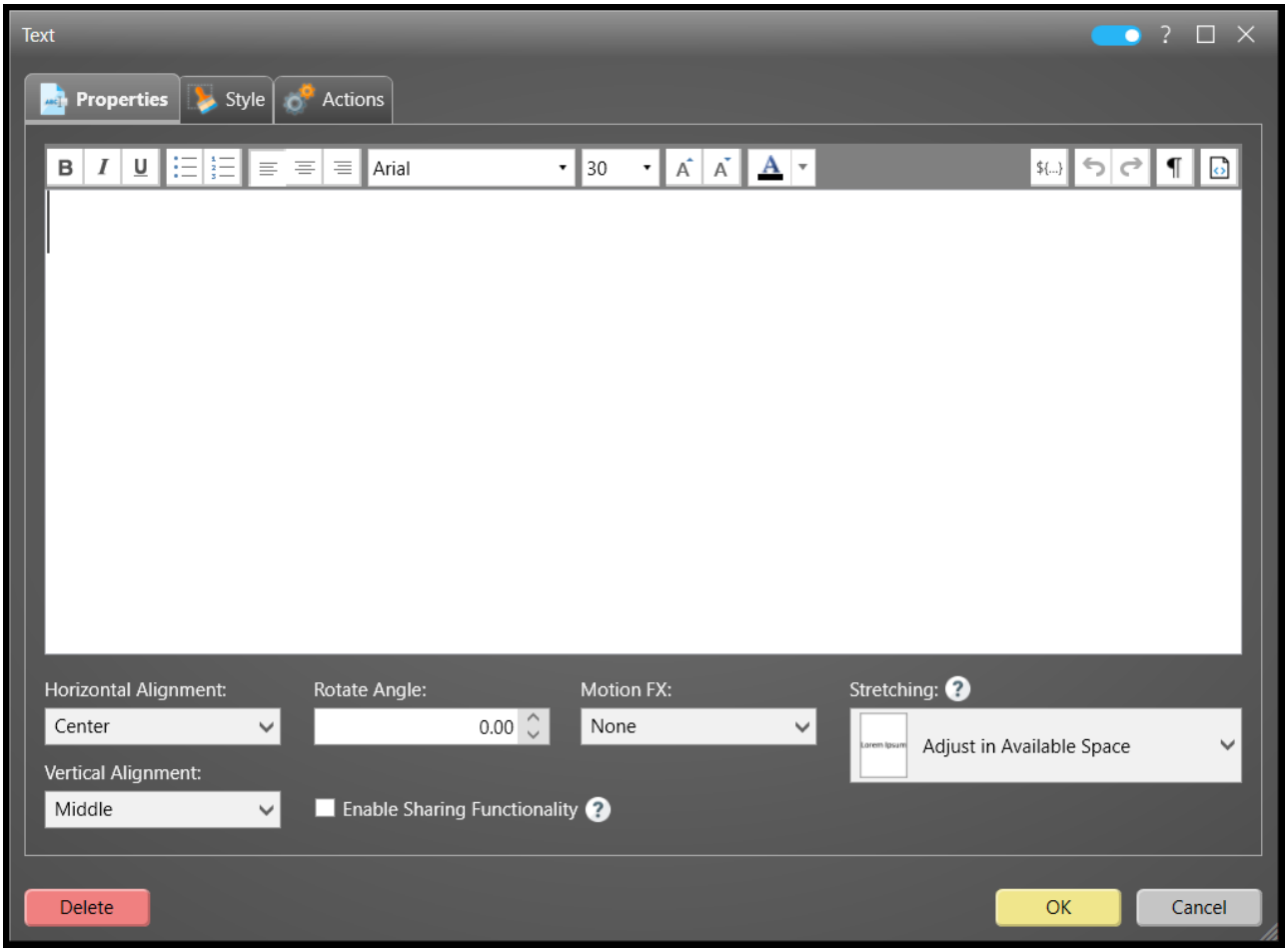
6.5.4.6 Text

You can add formatted text elements to your pages using the **"Text"** media object. Internally, the text is stored in HTML format. You can switch between a WYSIWYG ("What you see is what you get") and a HTML source view when editing text elements in the *FrontFace Assistant*.



Settings Dialog: Text

The "**Stretching**" option has a special meaning for text media objects: If "**Automatic Word Wrap**" is selected, the set font size is applied 1:1. Therefore, make sure that you adjust the font size of your text so that it is easily visible on the screen.

If any other stretching option is selected, the set font size will only have a relative effect within that text element. Since no automatic word wrap is applied, you may need to enter line breaks manually if you want to wrap lines within the text media object.

Text media object also support the **"Text FX"** animation effects. These are animation effects that are applied to the text. Some of the effects (marked with "∞") run infinitely (such as blinking text) while others are only applied when the text is shown on the screen.

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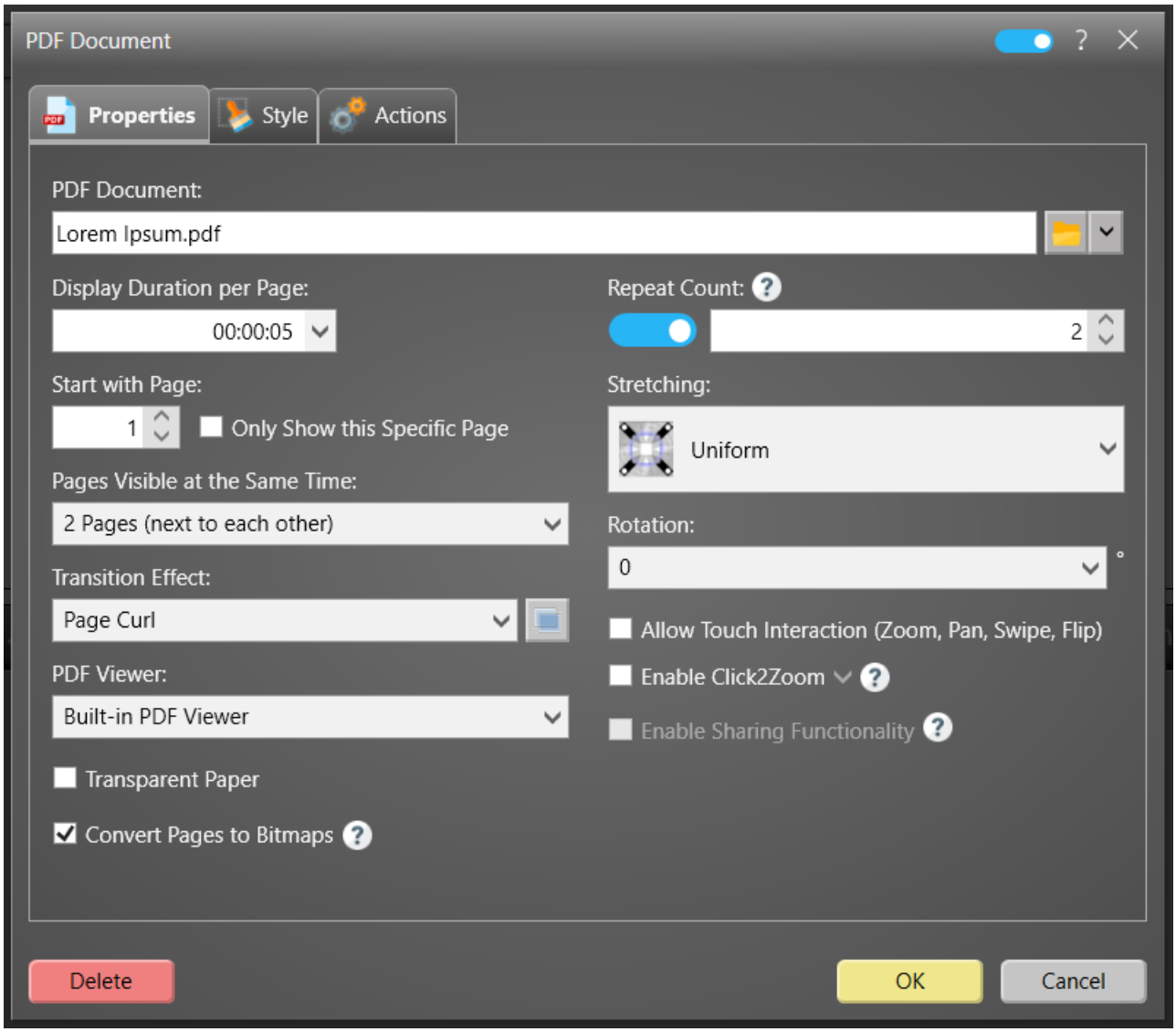
Placeholders 139 can be conveniently added by clicking the **"Insert Placeholder..."** button. The required syntax for placeholders is generated automatically when using this button.

6.5.4.7 PDF Document

"PDF Documents" can be added into pages like any other content.



Settings Dialog: PDF Document

In case a PDF document has more than one page, the pages are shown one after another. This also adds a "natural length" 71 to PDF media objects (total duration = number of pages x display duration per page). By settings the **"Repeat Count"** option to "Play Infinitely", you can make a PDF document loose its natural length.

A dedicated **"Transition Effect"** for turning the pages of a PDF document can also be specified as well as the **"Display Duration per Page"**.

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You can use the **"Pages Visible at the Same Time"** setting to specify whether more than one page of the document should be displayed. This allows 2-3 pages to be displayed either next to each other or on top of each other.

If Expert Mode 44 is activated, you can also specify a start index (**"Start with Page"**) that determines which page of the document should be displayed first. If the **"Show this Page Only"** option is activated at the same time, there is no automatic "paging" for multi-page documents.

It is also possible to apply a **"Rotation"** to rotate the document if required.

By default the option **"Convert Pages to Bitmaps"** is enabled which pre-renders all pages of a PDF document into bitmaps that are then displayed instead of the actual, real PDF pages. This increases performance at runtime. If you experience any quality issues, you can try to disable this option.

6.5.4.8 Slideshow

Sometimes you do not only want to add just single images but an entire set of images. Instead of adding multiple pages into a playlist, each with a single image on it, you can just add one page with a **"Slideshow"** media object.

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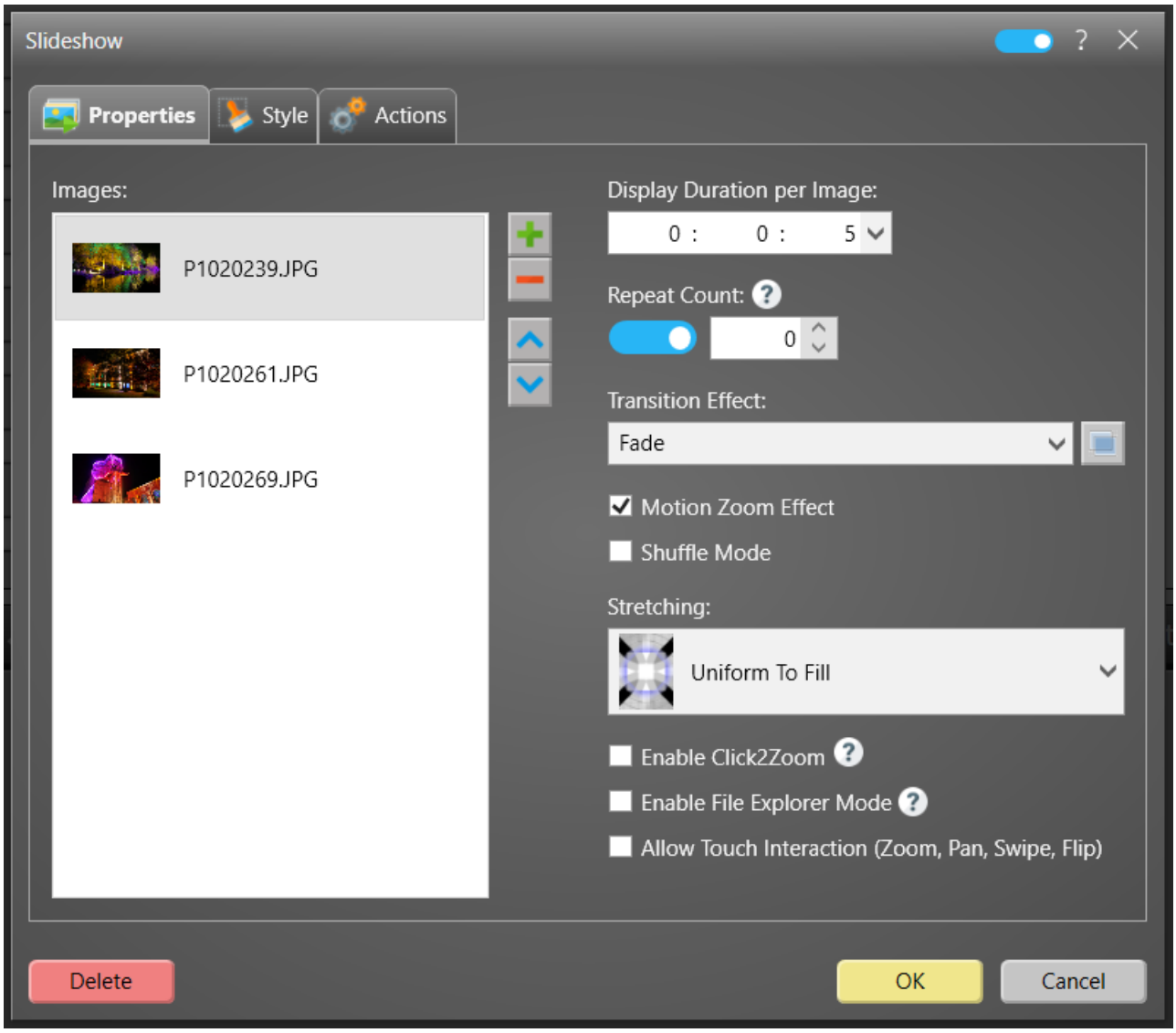

Settings Dialog: Slideshow

Apart from selecting the images that a displayed, you can also define their display order and some additional settings like the "**Transition Effect**" or if you would like to use "**Motion Zoom**". Since you can define a display duration of an image in the slideshow, the slide show media object has a natural length unless the "**Repeat Count**" is set to "Play Infinitely".

Instead of playing the images in the given order, you can also enable the "**Shuffle Mode**". This will make the images show up randomly.

When the optional **File Explorer Mode** is enabled, the images are not played automatically. Instead, thumbnails are shown which can be selected interactively by the user for full screen viewing. To customize the caption, assign a file name that contains two square brackets and text to be displayed in between, e.g. `"P123456 [This text will be displayed].jpg"`.

The slideshow also supports optional **touch interactions** (zoom/pan/swipe).

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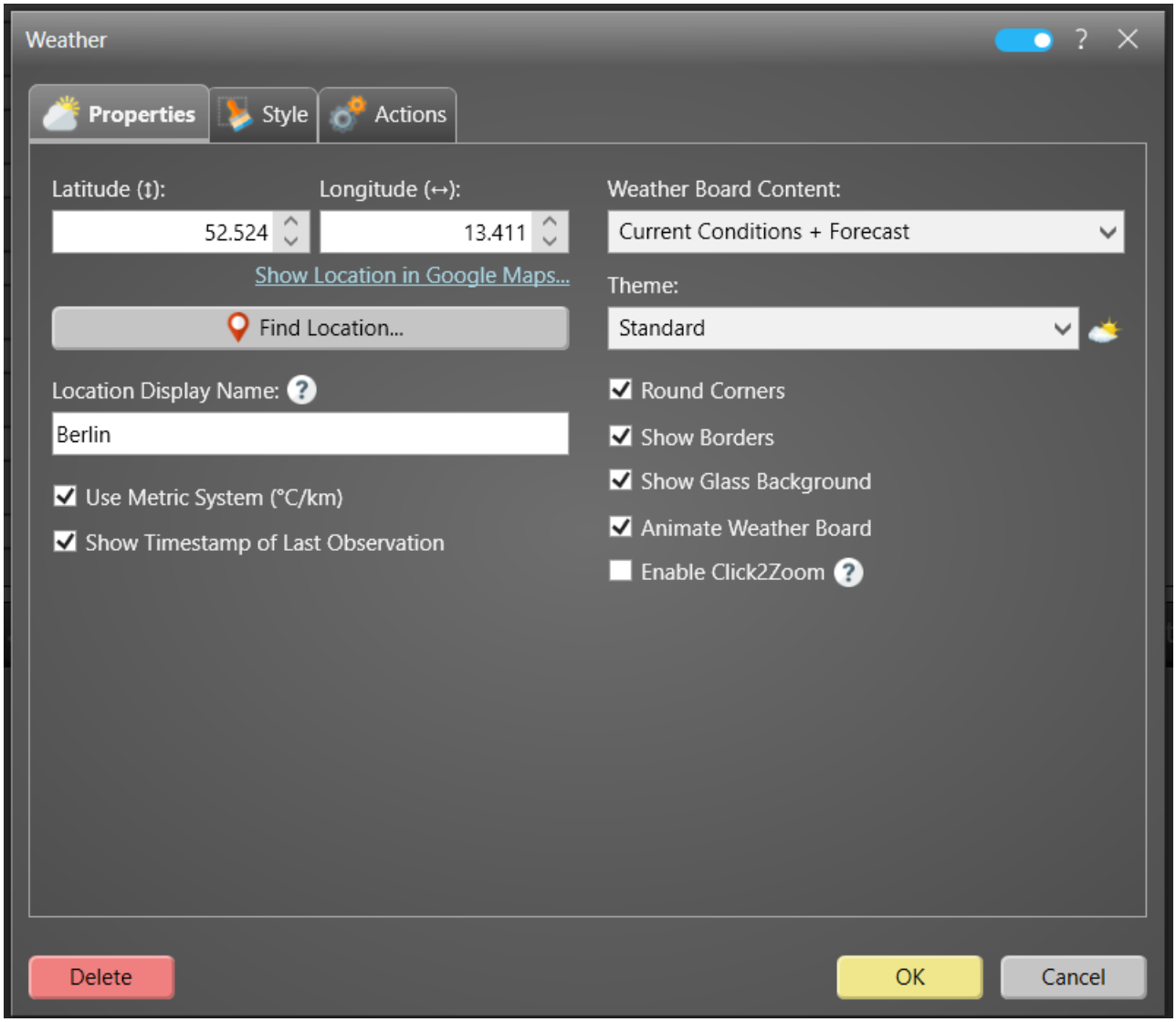
6.5.4.9 Weather

With *FrontFace* you can display the current **"Weather"** condition plus a 3-day forecast for any location on earth! The location is set by geographic coordinates. Either enter latitude and longitude of your location manually or use the "**Find Location...**" button to determine the desired location.



Settings Dialog: Weather

You can also enter a "**Display Name**" of the location that is shown on the screen. Instead of the location name, you could also enter a neutral text such as *"Weather Today:"*.

The weather data is updated by the *Player App* automatically approximately every 4 hours. You optionally show a time stamp of the weather data on screen. However, this is not the date/time when the data was fetched from the server but the date/time of the observation and/or forecast.

If you block any traffic to the Internet, you have to create a rule in your firewall to allow HTTPS traffic (port 443) to the host **`api.mirabyte.com`**!

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Apart from various options, you can select the type of weather content you want to show and the visual theme.

The weather widget is localized automatically, depending on the active language of the player PC. You can use the Setting **"Default Language"** in the Advanced Player Settings 61 to change the language on a player PC in case you do not want to change the system language. The following localizations for the weather widget are currently available:

- English (Fallback)
- German
- French
- Spanish
- Italian
- Czech

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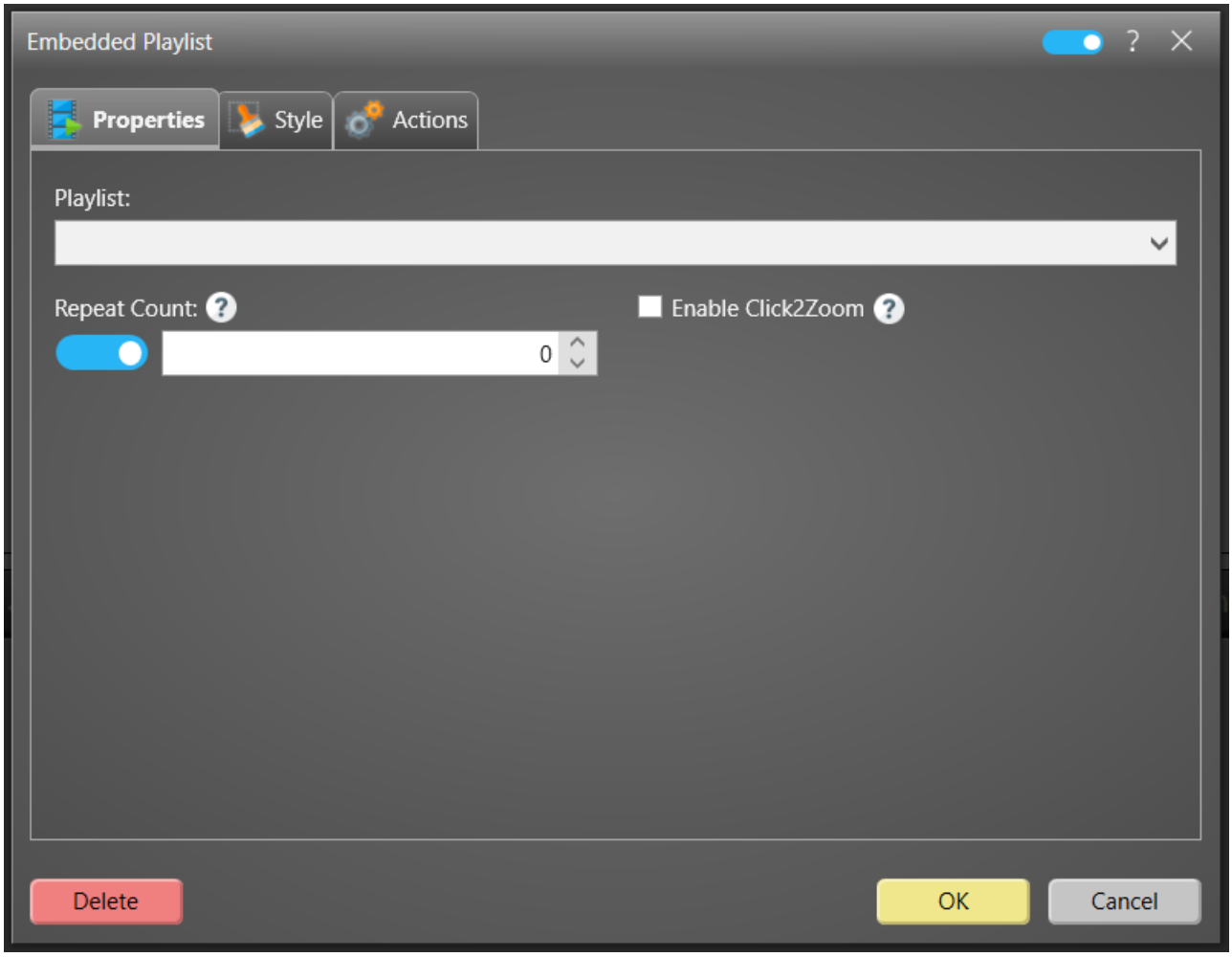
6.5.4.10 Embedded Playlist

A very powerful feature of *FrontFace* is the ability to integrate playlists of your project into other playlists as media objects (so called **"Embedded Playlist"**).



Settings Dialog: Embedded Playlist

Please note that it is only possible to integrate playlists that do not contain **"Embedded Playlist"** media objects by themselves!

For more information, please see the section Embedded Playlists into other Playlists 148.

6.5.4.11 Hot Folder

Normally, you add content elements such as images, PDF documents or videos into playlist pages using the appropriate media object type. In case of content that needs to be updated frequently, this can be a lot of manual work since every time the *FrontFace Assistant* needs to be started in order to update the media objects. Finally, you always have to publish your project to reflect the changes on the players.

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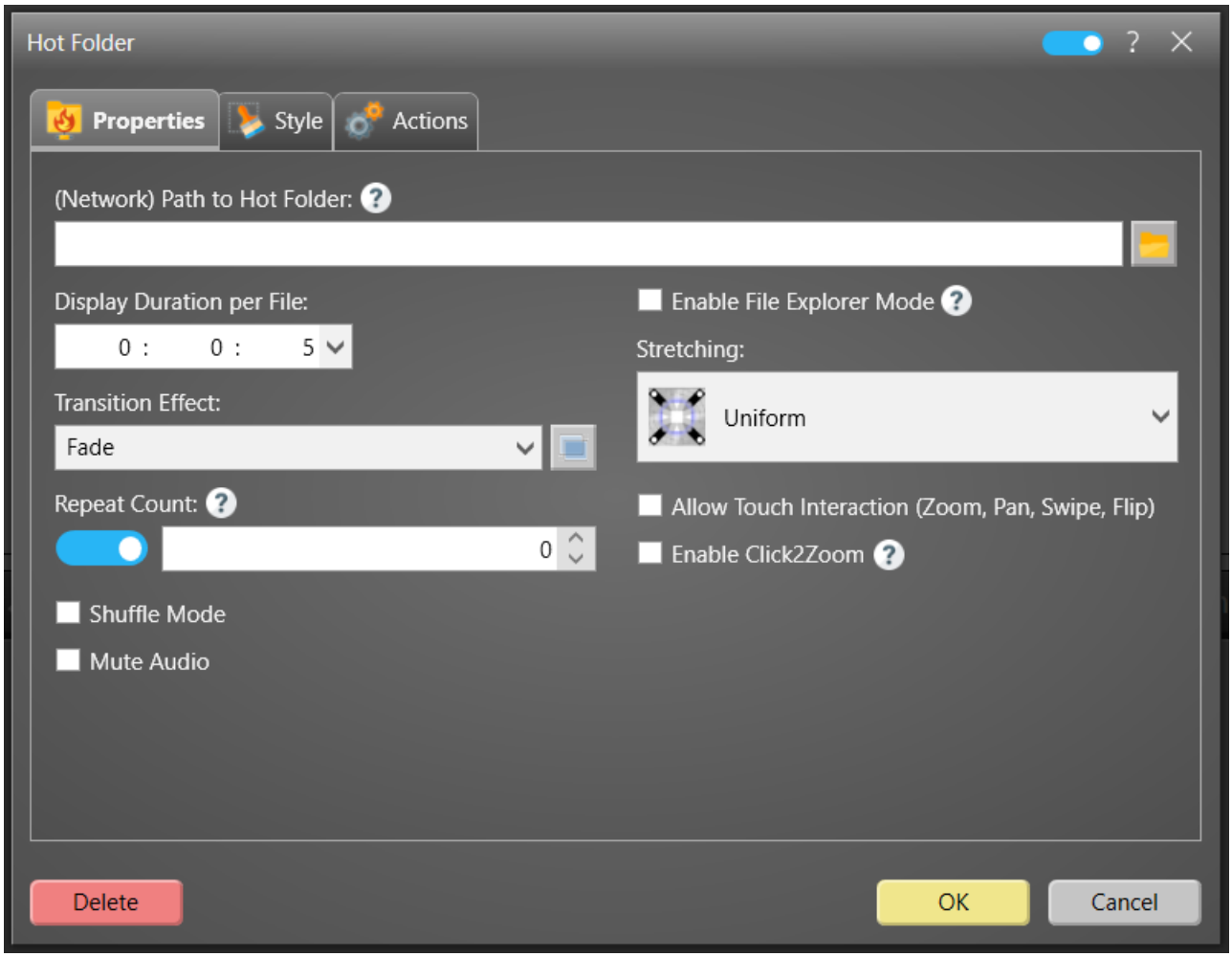

Settings Dialog: Hot Folder

An alternative to this is offered by the **"Hot Folder"** media object which allows you to integrate the files of a shared network folder as "live content" into your pages. To update content, you just need to update/replace/add or delete files in the hot folder. There is no need to publish the project with the *FrontFace Assistant* since the content is fetched instantly by the *FrontFace Player App* when the **"Hot Folder"** media object is being shown on the screen.

The **"Hot Folder"** can alternatively be used interactively in the so-called **"File Explorer Mode"**. In this mode, subfolders can optionally be included for user navigation.

For more details, please see the section Hot Folder 135.

Tip: If you only want to add a single file as media object instead of an entire folder, please also have a look at **"Symbolic Links"** in the section about file management 86.

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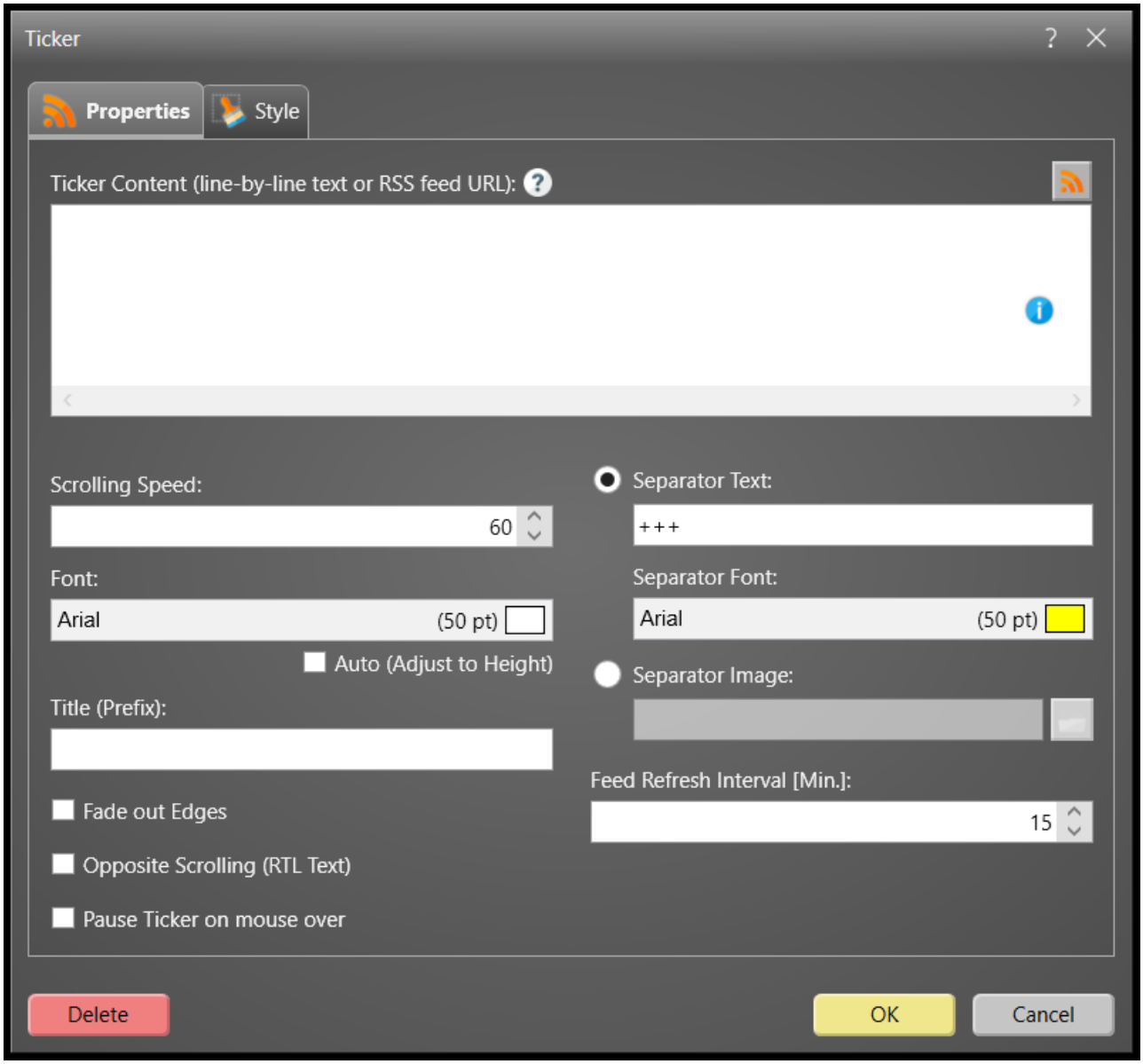
6.5.4.12 Scrolling Ticker

To display text messages or headlines on a scrolling ticker tape, you can use **"Scrolling Ticker"** media object.



Settings Dialog: Scrolling Ticker

To add a permanently visible ticker to a playlist 67, that e.g. is shown at the bottom of the screen, an appropriate screen layout 82 must be selected that contains a ticker media object.

To select a screen layout with a ticker, select your playlist in the **"Contents"** section and click on the pencil icon at the top to access the **"Playlist Settings"** 67 dialog. Here you select a layout with a ticker as **"Screen Layout"** (for example *"Full Screen with Ticker"* or *"Full Screen with Ticker + Clock"*). After you have selected the layout, you can configure the ticker by clicking on the appropriate container.

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It is possible to either enter the headlines, **line-by-line** or enter the path/URL of an **RSS** or a **plain text file** either on a Web server (via HTTP) or on a file server (UNC file path).

In case your provide an RSS or plain text file as source, you can also define the **"Feed Refresh Interval"** in minutes. After the specified time has elapsed, the feed will be fetched again. In the meantime, a cached version will be used by the *Player App*.

The appearance of the ticker can be adjusted to your needs in regards to scrolling speed, colors, font, etc. You can also specific a prefix text that is shown statically on the ticker bar in front of the scrolling text.

For languages like Hebrew or Arabic, you can change the scrolling direction of the ticker.

To use a ticker in a Touch Menu 73, a corresponding **menu layout** (for example, *"Main Menu with Ticker"* or *"Main Menu with Ticker + Clock"*) must be selected in the **"Touch Menu Settings"** 74 dialog, as described above.

6.5.4.13 Date / Time

You can integrate the current date and/or time into your pages using the **"Date / Time"** media object.

This media object actually can not only display the current date or time as digital or analogue clock, it can also display a countdown timer or an egg timer.

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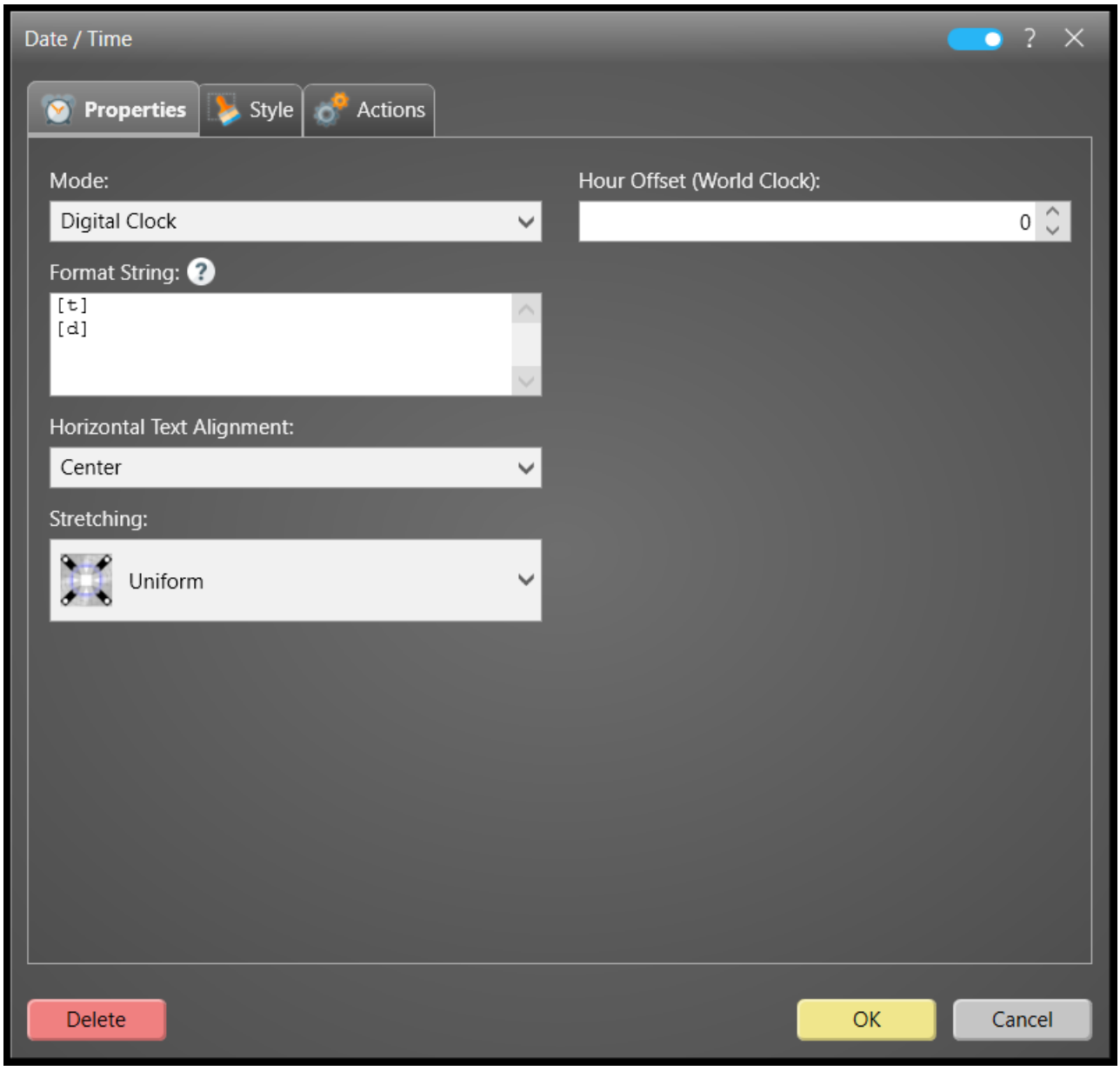

Settings Dialog: Date / Time

A countdown timer has a fixed point of time in the future to which is counts down, whereas the egg timer has a certain time span set which it counts down to "zero". The egg timer always starts again all over when the page with the **"Date / Time"** media object appears on the screen.

For maximum flexibility, the date/time format in case of the digital clock and the countdown / egg timer can be entered as so called "format string". This is a special syntax that lets you specify how the date/time data is displayed on the screen.

You can use pre-defined standard date/time formats as well as custom format strings.

In addition to that, you can also format the text using a HTML-like mini markup language. The supported tags are:

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```
<b>Bold</b>

<u>Underline</u>

<i>Italics</i>
```

and the `<span>...</span>` tag with the following attributes: `FontWeight`, `FontSize`, `FontStretch`, `FontStyle`, `FontFamily`, `Background`, `Foreground`

The most common standard date/time format strings are "`[t]`" for time and "`[d]`" for date. For countdown and egg timer, the default time span format is "`[g]`". More information on standard and custom format strings can be found here:

- Date/Time (Standard Formats, Custom Formats)
- Time Span (Standard Formats, Custom Formats)

In contrast to custom format strings, standard format strings always have to be written in brackets ("`[..]`")!

Apart from the digital clock, this media object can also show an analogue clock with animated clock fingers. You can either use the minimalistic, built-in clock face or any PNG image as a custom clock face (image should be quadratic).

In order to simulate a world clock, you can define a custom offset based on your current time zone. This way, you can e.g. create world clocks in your playlists that show the time of different cities in case you are operating an international company with offices in different time zones around the world.

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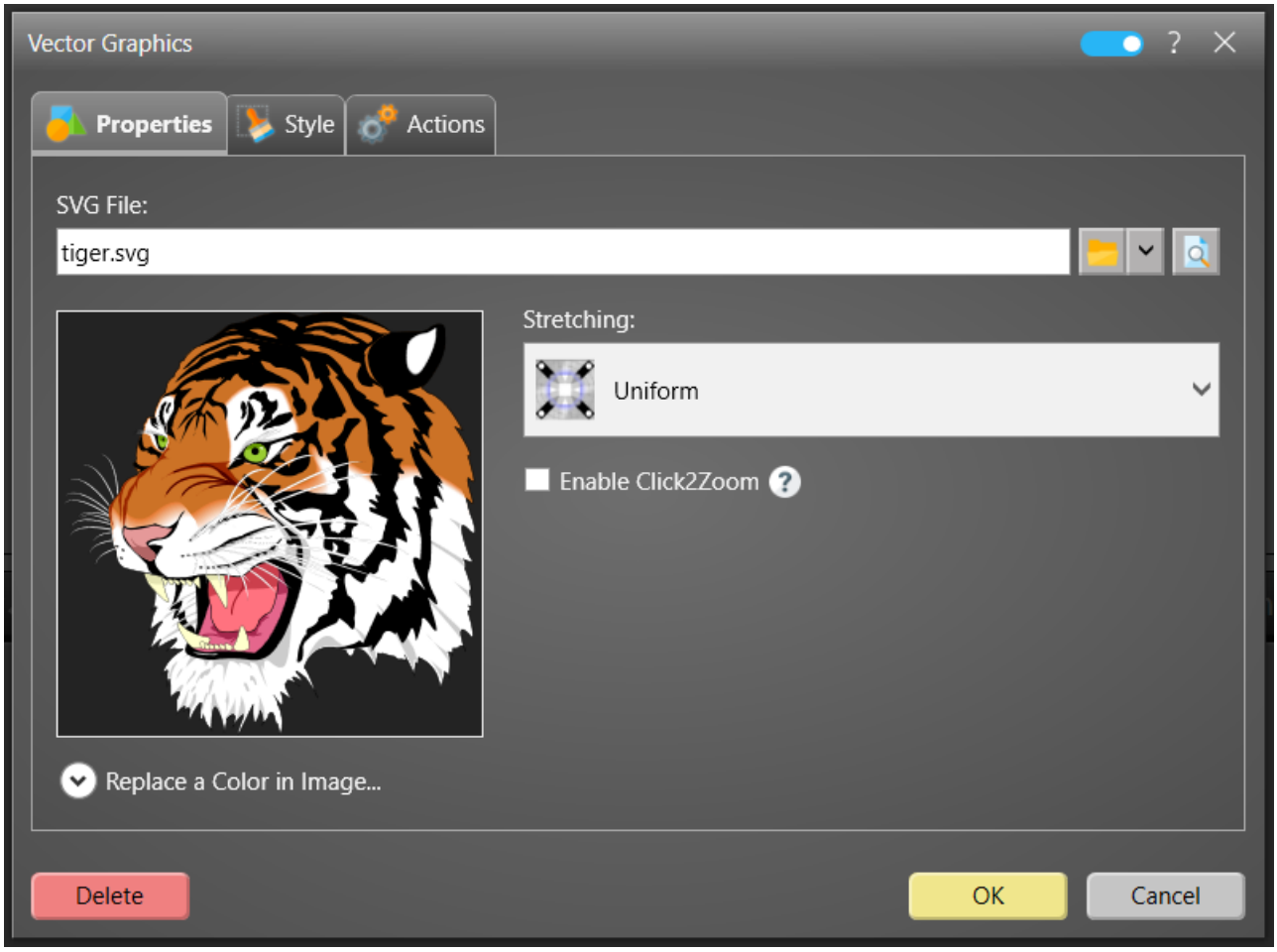
6.5.4.14 Vector Graphics

FrontFace can not only display bitmap images (such as PNG or JPEG) but also **"Vector Graphics"** by supporting the **SVG (Scalable Vector Graphics)** format.



Settings Dialog: Vector Graphics

You can select any SVG file and, as with bitmap images, optionally replace a given color in the graphics with another user-defined color. This is perfect for adding design elements (such as frames, boxes or arches) to your playlist page without having to create individual SVG files only for slight color changes.

Please note that due to the complexity of the SVG file format, not all features (such as advanced transparency or rendering effects) are fully supported by *FrontFace*.

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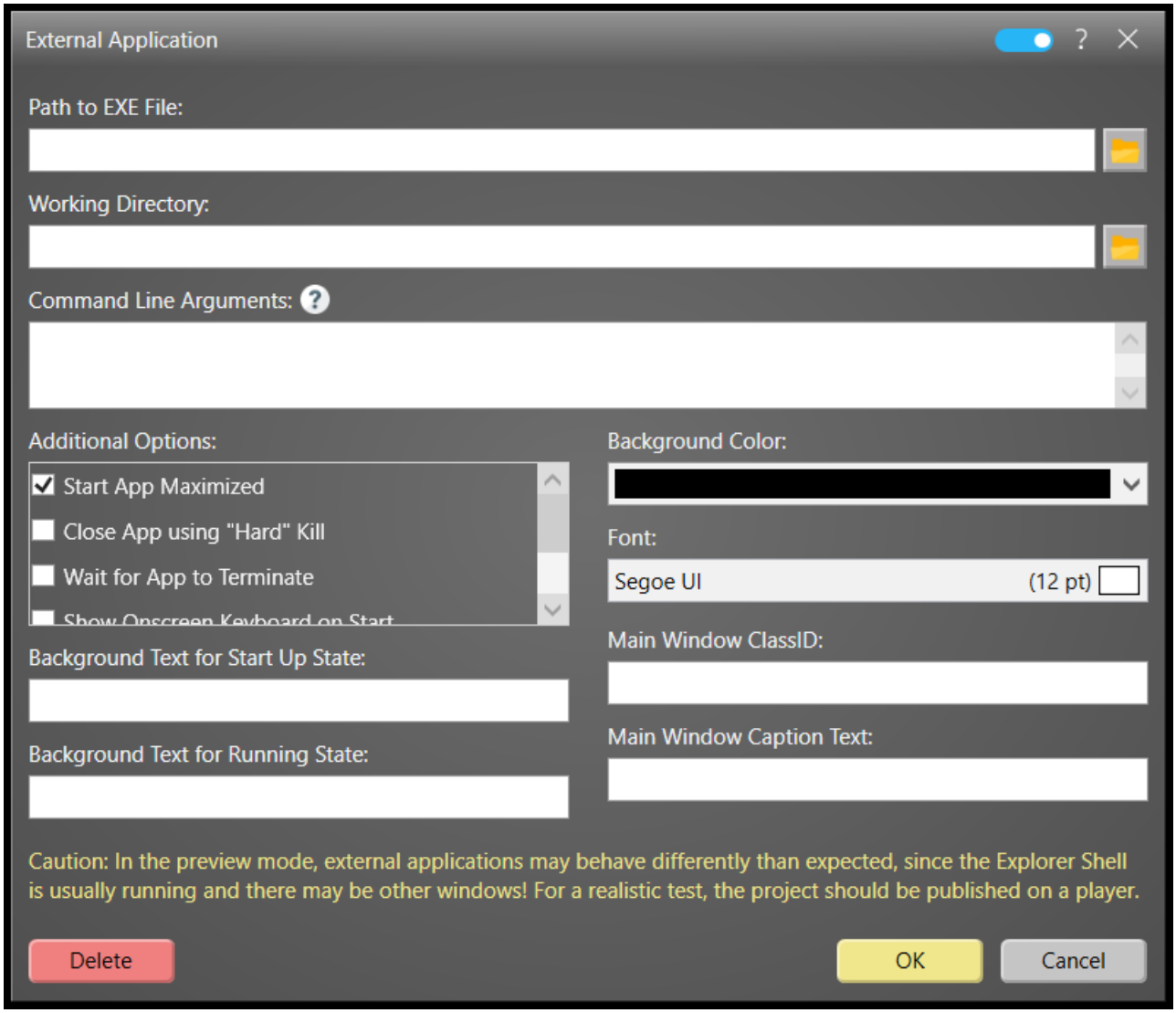
6.5.4.15 External Application

FrontFace can also be used to start and close external Windows applications (EXE) within your playlist. This allows you to integrate special applications that would otherwise not allow you the integration in a digital signage application. E.g., if you have a special BI report viewer or want to display *Excel* spreadsheets, you can use the **"External Application"** media object to seamlessly integrate these applications into your playlist.



Settings Dialog: External Application

You have to provide the path to the EXE file you want to execute and an optional working directory (the EXE file of course must be present on the player PC!). In addition to that, you can specify a custom command line with arguments that are passed to the executed file. You may use the following placeholders to pass the display rectangle for the application within the playlist page: `%LEFT%`, `%TOP%`, `%RIGHT%`, `%BOTTOM%`. Some applications like e.g. *VLC video player*, can use this information to position their window at the desired location. The `%STATICDIR%` placeholder contains the path to the

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`"\Static\"` folder within the `"\Media\"` folder of your project. This can be used if you want to ship special files to the player during the publishing process.

Additionally, you can specify if the window of the application is supposed to be started maximized and if you want to wait for the application to terminate (this is useful if the application is used interactively and the user closes it manually). If you should experience any issue with closing the application automatically when the playlist page ends, please select the **"Close App using "Hard" Kill"** for a more reliable method to close the application.

If your application needs some time to load, you can define a **"Background Text for Start Up State"** that is shown on the screen while your application loads. An additional text for the running state can also be provided.

The option **"Adjust Work Area (Desktop)"** allows to shrink the area on the screen in which the application window can be shown when it is maximized, to the actual bounds of the media object in the current layout. Please note that this only works if there is only one single **"External Application"** media object on the screen at a time. This option only takes effect if the content is run in player mode or in full screen preview mode.

For examples on how to integrate external applications like *Excel* or *VLC*, please see section Integrating External Applications 150.

Notice: Please note that only Windows desktop applications are supported (normal EXE files). Other types of Windows Apps, which are often referred to as "Metro Apps", "Windows Store Apps" or "Modern Apps" (installed from the Microsoft Store) are not supported due to technical restrictions.

6.5.4.16 Plugin

FrontFace comes with a lot of built-in media object types that are ready-to-use. However, due to the vast set of possible applications, *FrontFace*, by design, cannot cover all and everything. But due to the built-in **plugin** 141 interface, you can easily add additional functionality, such as displaying appointments from externals calendars or integrating live TV channels. In addition to that, you can not only use the available plugins but you can use the free **Plugin SDK (Software Development Kit)** 141 to create your own, custom plugins.

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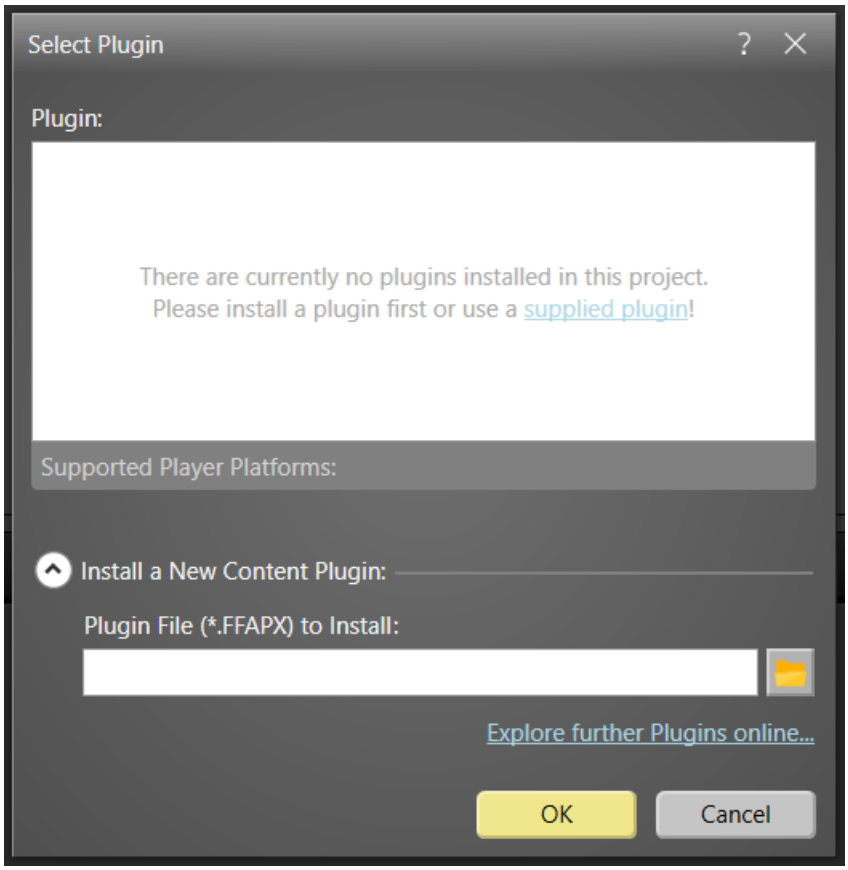

Settings Dialog: Plugin

To install a plugin, either select the **"Plugin"** media object or click on **"Manage Plugins..."** in the Project Menu 39.

A plugin is provided as **`.FFAPX`** file. After you have installed a plugin, you can select it from the list of available content plugins. Similar to other media objects, every content plugin has a settings dialog where you can configure the plugin. Most plugins come with a separate PDF manual that explains the configuration and use of the plugin in detail. In the settings dialog of the plugin, there is a hyperlink that lets you open the manual within the *FrontFace Assistant*.

Plugins (both free ones and buy content) are available on the mirabyte homepage in the download section.

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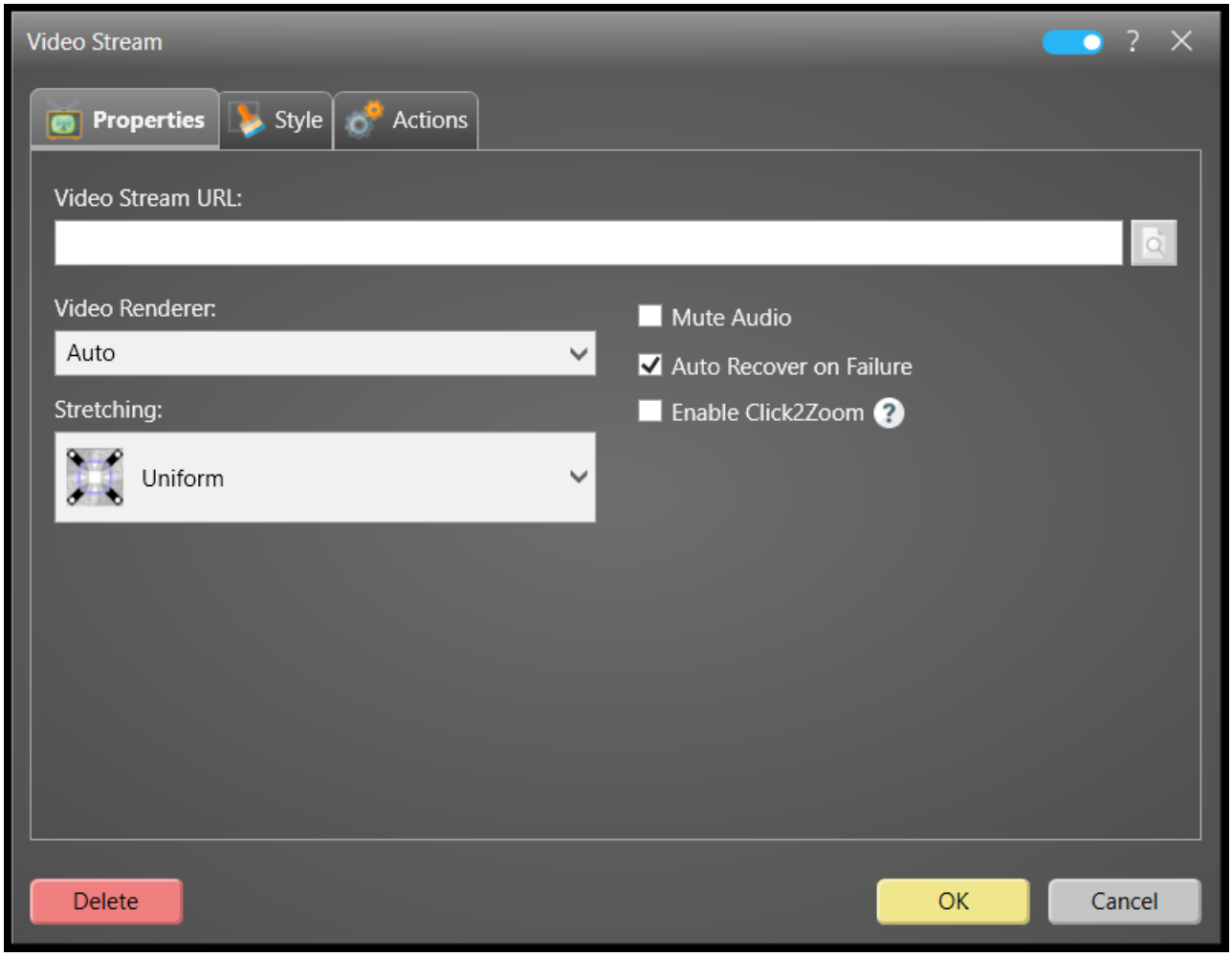
6.5.4.17 Video Stream

Apart from videos 91 where the video file is physically published to the player, *FrontFace* also supports live **"Video Streams"**.



Settings Dialog: Video Stream

You just need to provide the URL of the video stream. As with normal videos, you can select the video renderer, either **DirectShow** (recommended, but requires LAVfilters 15 to be installed) or **Windows Media Foundation**. If your video stream works with *Windows Media Player*, you can select **"Windows Media Foundation"**. Generally it is recommended to use **DirectShow** in combination with *LAVfilters* for maximum compatibility and best performance.

We generally recommend the **RTSP (real-time streaming protocol)** when integrating video streams into *FrontFace*. This protocol is broadly supported by most IP cameras and streaming servers.

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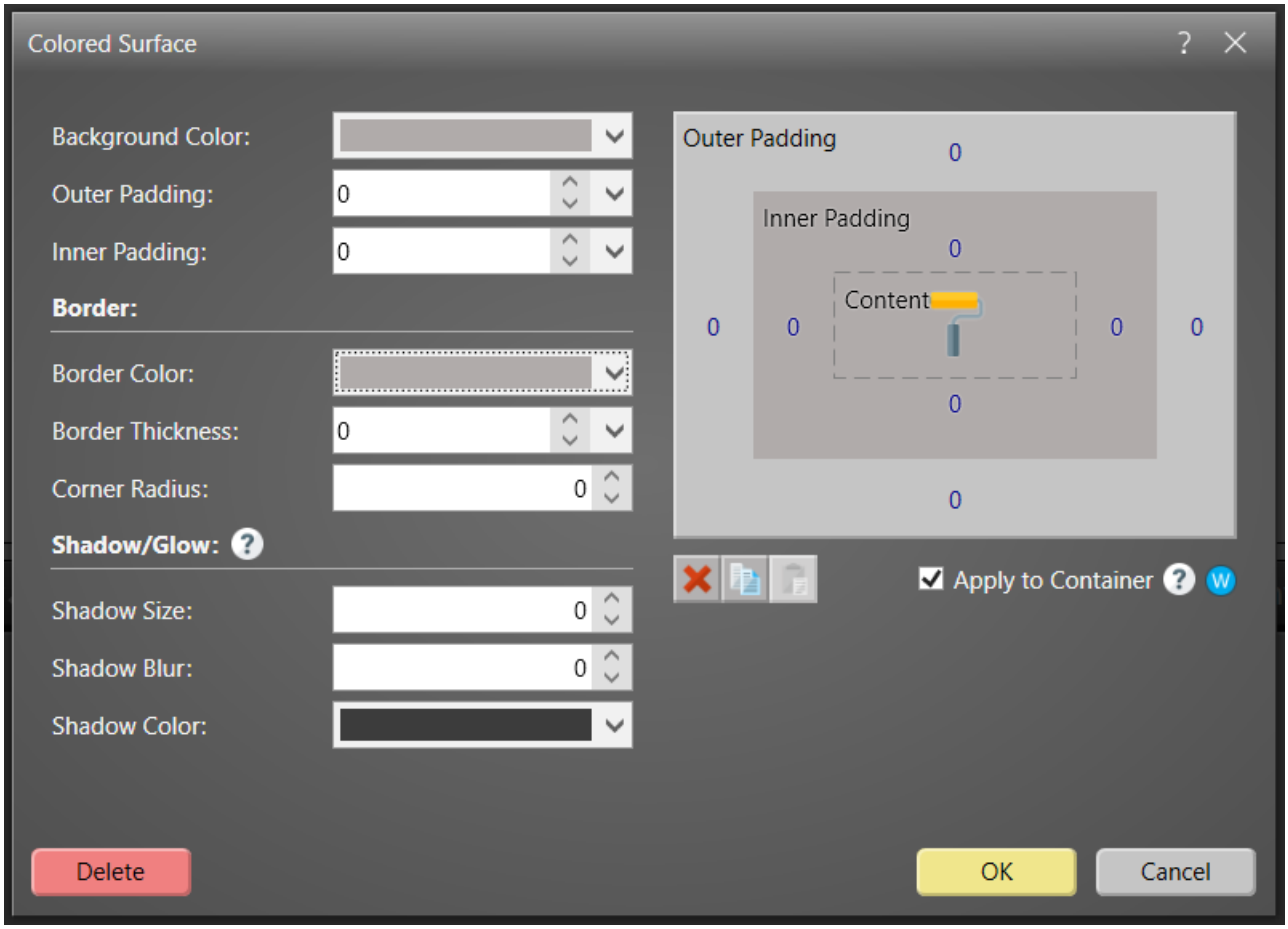
Notice: To integrate **YouTube live streams**, you must proceed as described in the section "Integrating YouTube Videos" 151. The media object "**Video Streams**", however, does NOT support YouTube live streams!

6.5.4.18 Colored Surface

The **"Colored Surface"** lets you add a colored background to a container. You can select a simple, solid color or a gradient color brush (linear or radial).



Settings Dialog: Colored Surface

In addition to that, you can also define a **border color** and **border thickness** as well as a **corner radius** (for rounded corners) and a **padding**.

This media object is perfect for background containers (e.g. in Overlay Layouts 143). As always, the defined colors or gradients may also contain transparency information (alpha channel) which gives you even more design options.

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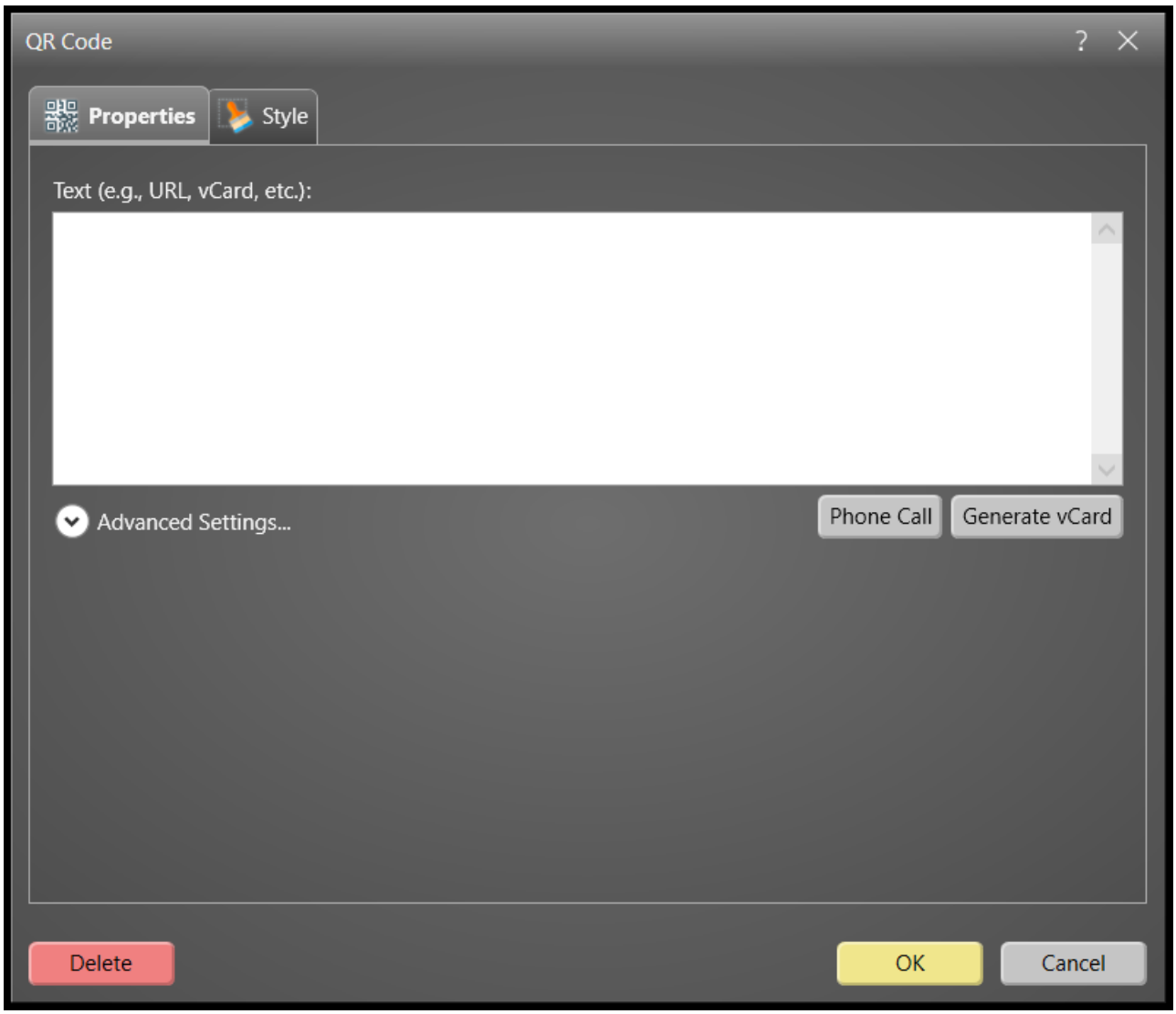
6.5.4.19 QR Code

A **"QR Code"** (Quick Response Code) is a 2D bar code that can be scanned with a smart phone camera in order to obtain the data that is encoded. It is possible to encode simple text, URLs, phone number and even entire contact records (vCard).



Settings Dialog: QR Code

To create a QR code that triggers a Web link, simply enter the desired URL ("http://...") into the text field of the settings dialog for the QR code media object. For phone numbers that can trigger a call or for encoding vCards, please use the wizards that are available in the settings dialog.

You can also specify the foreground color of the 2D bar code as well as the background color. It is recommended to select colors with good contrast (e.g. black & white) for a trouble-free scanning experience on the screen.

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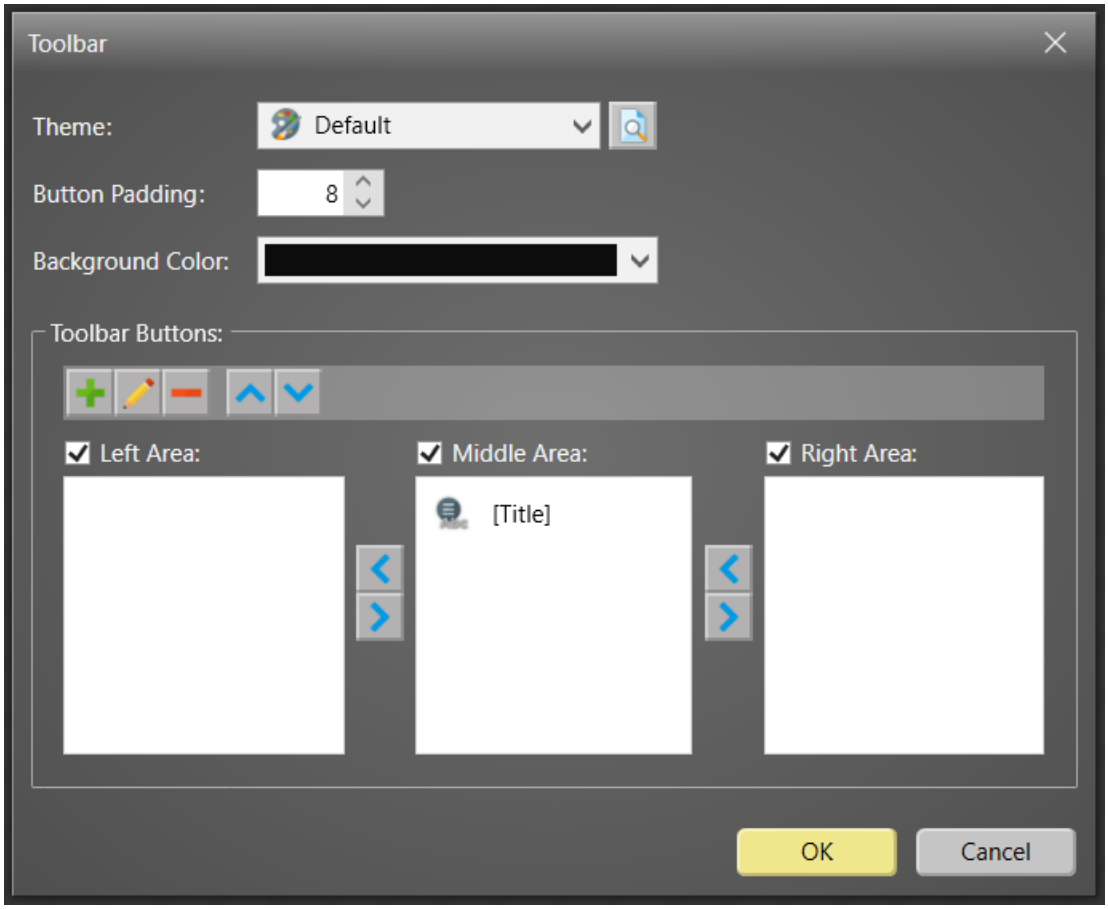
The advanced options that are available are intended for experienced users only. In most cases, there is no need to change those. Please see the QR code specification for details on the advanced features.

6.5.4.20 Toolbar

A **"Toolbar"** media object can hold multiple text or button elements which are grouped in three different areas (left, center, right). The elements appear in the same order as they appear in the lists of the Toolbar media object settings dialog. You can use the arrow buttons to move the buttons between the three areas or to move them up/down within an area. Elements that are assigned to the left area will appear aligned to the left, elements in the center area appear centered horizontally and elements in the right section are aligned to the right.



Settings Dialog: Toolbar

- **Text Elements:**
  Text elements may contain placeholders and/or static text. A typical use case for a text element is displaying the title of the currently viewed touch menu button. The text may contain the following placeholders:

Placeholder	Description
`${F_CONTENT_TITLE}`	Content Title (taken from the button that hold the page with the current content)

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Placeholder	Description
`${F_MENU_TITLE}`	Menu Button Title (the current menu level)
`${F_PAGE_TITLE}`	Title of the Current Page
`${F_CONTENT_PAGE_INDEX}`	Index of Current Page
`${F_CONTENT_PAGES_TOTAL}`	Total Pages
`${"Page F_CONTENT_PAGE_INDEX of F_CONTENT_PAGES_TOTAL"}`	This is a "contextual" placeholder. If the displayed content has only one single page, it will not be displayed.

- **Toolbar Buttons:**
  Buttons can execute so called "Actions" that are executed when the button is clicked. Buttons can be either visible, disabled or hidden if the assigned action(s) is unavailable in the current context. A typical action e.g. is the "**Close Content Viewer**" action that closed the currently shown content in a touch menu. In most cases this action is assigned to a button with an "[X]" as caption or icon. For more information about the available functions that can be used, see the section "Actions" 121.

- **Spacer Elements:**
  A third element that can be used on toolbar is the "Spacer": This is just a small white space that can be added to visually group button or text elements in the toolbar. You can set width of the spacer element in pixels to determine how much real estate it occupies on the screen.

For information on where to use the Toolbar media object, please see the Toolbar section 80 of the Touch Menus 73 section.

6.5.5 Media Library

The **Media Library** centrally manages the media (images, videos, PDF files, XPS files, vector graphics and audio files) of your project. You can open the media library by clicking " **Media Library...**" in the " **Settings Menu**" or when you add or select the content file in a settings dialog of a media object.

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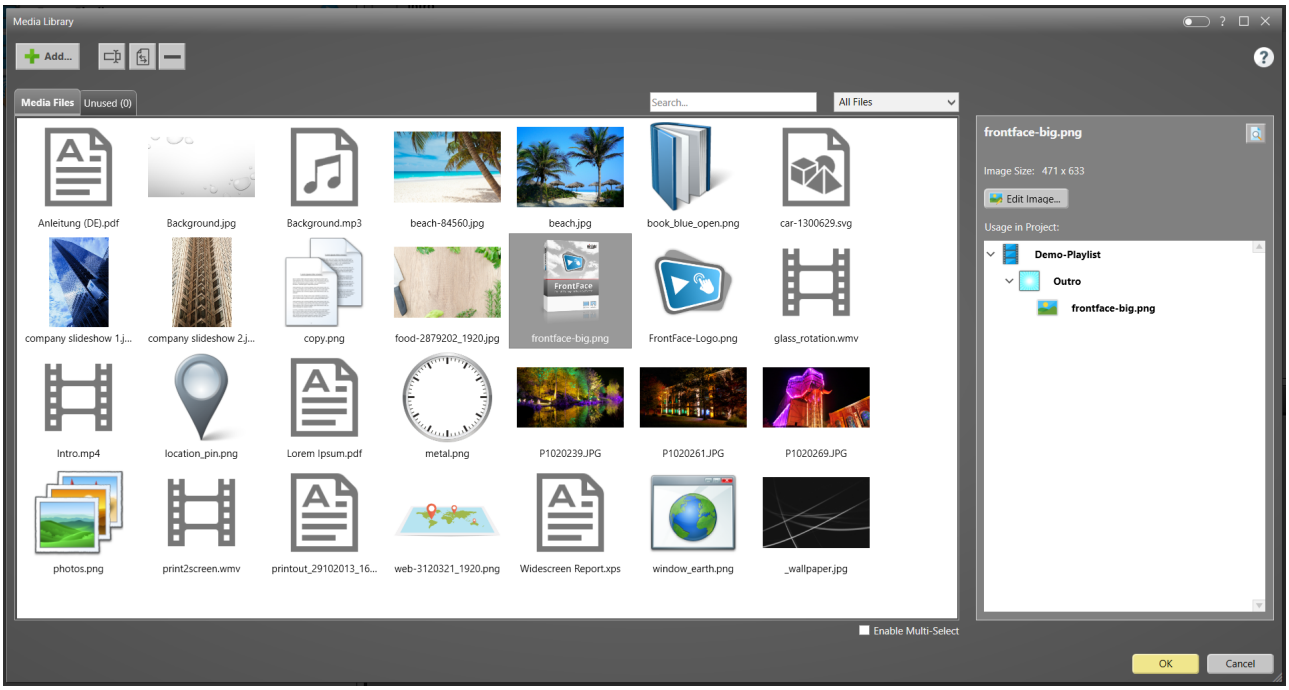

Media Library

When you select a file, further detailed information is displayed on the right pane and if/where this file is used in your project. Image files can be edited with the built-in image editor. You can rename or replace a file at any time. The file will then be automatically updated at all used places in your project.

In the "**Media Files**" tab, all files are displayed that are currently used in a playlist or in a touch menu of your project. Deleting a file which is actively used in the project is therefore not possible. To do this, first open the settings dialog of the corresponding media object in your playlist or touch menu and delete it there, first. Afterwards, the file is listed in the "**Not used**" tab. Here all files are listed that are currently not (anymore) used in your project. You can either delete them permanently or keep them for later use.

In certain situations, you can also select more than one single file. However, the "**Multiple selection active**" option must be selected for this.

If you activate the "Expert Mode" 44, you can also access the "Static" media directory 156 of your project.

6.5.6 Actions

Actions represent a concept in *FrontFace* that allows you to gain more flexibility and to easily integrate third party systems into your touch menus or digital signage playlists. Actions are an advanced concept and are not intended for normal use cases but for advanced or very special integration scenarios where the regular functionality of *FrontFace* may not be sufficient.

In order to use Actions, you have to enable the "Expert Mode" 44 in the *FrontFace Assistant* for your project.

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Actions can be assigned to certain events that occur during the runtime of the *FrontFace Player App*. These are the event types that are available for playlists, touch menus, touch menu buttons, pages and toolbar buttons:

- **Start:**
  The start actions are executed (once) when a playlist or a touch menu (button) is started.
- **Begin:**
  The begin actions are executed when a playlist, a touch menu, a touch menu button or a page is displayed. In case of a playlist or a touch menu button that loops through its pages, the begin actions are executed every time the playlist starts from the beginning.
- **End:**
  The end actions are executed when a playlist, a touch menu, a touch menu button or a page has displayed its last page. In case of a playlist or a touch menu button that loops through its pages, the end actions are executed every time the playlist has reached the last page.
- **Stop:**
  The stop actions are executed (once) a playlist or a touch menu (button) has ended.
- **Click:**
  The click actions are executed when a media object or a toolbar button is clicked or tapped by the user.

There are different types of actions available that can be assigned to these events:

- *Integration:*
  - **Start Process (EXE)**
    Lets you start a Windows application (EXE or CMD) with an optional command line. This can be used for integration scenarios, e.g., if you have a command line-driven application to turn on/off a light in a room, you can use this action to automatically control the light when e.g. a certain playlist page is shown.
  - **HTTP Web Request**
    Lets you perform a HTTP GET or POST request to call a Web service. Optional parameter can also be supplied. This action is also intended for integration scenarios.

- *Content Sharing (see Printing and Sharing 145):*
  - **Send Content by Email**
    Allows sending the currently shown media object(s) where content sharing is enabled by e-mail. You need to specify an SMTP server that sends the e-mails. The user is promoted to enter the email address.
  - **Send Content to Printer**
    Print the currently shown media object(s) where content sharing is enabled on the systems default printer.
  - **Send Content to App**
    Lets you run a custom application (EXE) and pass the currently shown media object(s) where content sharing is enabled as command line arguments for custom integration scenarios.

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- *Menu Navigation:*
  - **Show Home**
    Return to the home page of a touch menu.
  - **Navigate Back**
    Navigates to the parent menu level in a touch menu.
  - **Show Language Selection**
    Show the language selection page to the user.

- *Content Viewer Control:*
  - **Close Content Viewer**
    Close the content viewer of a touch menu.
  - **Click2Zoom**
    Click2Zoom 144 is available for the *Click Action* of a media object 86. When this action is assigned, the user can click or tap on a media object in order to make it appear in full screen mode.

- *Playlist Control:*
  - **Show Next Page**
    Turn over to the next page in a multi-page touch menu button while the content viewer is shown.
  - **Show Previous Page**
    Turn over to the previous page in a multi-page touch menu button while the content viewer is shown.

- *On-Screen Keyboard (OSK):*
  - **Toggle On-Screen Keyboard**
    Shows or hides the integrated on-screen keyboard.
  - **Show On-Screen Keyboard**
    Shows the integrated on-screen keyboard.
  - **Hide On-Screen Keyboard**
    Hides the integrated on-screen keyboard.

- *Audio:*
  - **Increase Volume**
    Increases the volume of the main audio playback device.
  - **Decrease Volume**
    Increases the volume of the main audio playback device.
  - **Mute/Unmute Audio**
    Mutes or unmutes the main audio playback device.
  - **Play Audio File**
    Plays an audio file (only WAV format is supported!).

- *General:*
  - **Debug Output**
    Lets you display a text message on the screen for debugging and testing purposes.
  - **Terminate FrontFace**
    This action allows exiting the *FrontFace Player App* and returning to Windows. This action can be

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used when users should be allowed to exit *FrontFace* (e.g. to work with normal applications on the PC).

If you assign more than one action to an event, you can define the order in which the actions are executed. Most actions require a configuration or parametrization. If you click on the "pen" button next to the action in the list box of an event, you can open up a dialog where the action can be configured.

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6.5.7 Content Preview

Once you have created playlists 67 or touch menus 73, you can use the built-in **preview** function to see how your content will look like when it is run in the *FrontFace Player App*.

You can either run a preview of an entire playlist or touch menu (which also includes timing and transition effects) or of a single playlist page / touch menu button. If you click on the preview button ("▶"), the settings dialog of the preview appears. Here you can set the screen resolution and orientation that you want to simulate and if you want to run a full screen preview or a windowed preview.

In order to simulate an entire player where also scheduling an event sources are active, you can use the Player Preview 64 in the Players 47 section.

The **"Advanced Options"** allow you to specify the *Windows screen index* on which the preview is supposed to be run (perfect for multi-screen systems) and if you want to allow interaction or not. It is also possible to select a player from your project from which to take the player-specific settings for the preview session. If no player is selected, the default player settings will be used.

For simulating date/time-related features in the preview such as the visibility of certain playlist pages 69, you can also define a point of time which the *Player App* will then use as "current" time.

You can also define values for placeholders 139 to preview your content with test placeholders applied.

If you **double-click** the preview button ("▶", either for a playlist or a page), the settings dialog of the preview will not appear but the options from it will still be applied. So once you have configured your preview, you can just double-click on the preview button to run the preview function with the previously configured settings to save some extra clicks.

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6.6 Scheduling

Apart from defining your infrastructure (players in the menu section "**Players**") and your content (playlists and touch menus in the menu section "**Contents**"), you also have to define where and when to play which content.

In the "**Scheduling**" menu section you can either define "Timers" for time-based scheduling 126 and "Event Sources" for event-based scheduling 129.

Scheduling is always defined per screen. By default, the "**Advanced Scheduling**" is disabled which only gives you the option to assign a playlist or touch menu to a screen. The selected content will then run all the time on that screen. In this mode, you can also use the **"Publish Shortcuts"** 129 feature. If you prefer a more sophisticated controlling of that is being shown on the screen, you have to enable the "**Advanced Scheduling**". That way, you can define more complex timers and also event sources.

In addition to that, for playlist pages 69 and menu buttons 75, there is also a option available to schedule the visibility of individual pages 69.

6.6.1 Timer-based Scheduling

Schedule Timers (or just **"Timers"**) define when to show which playlist or touch menu on a screen. A timer is always tied to a specific screen of a player and assigns a playlist or a touch menu to it. There are different types of timers which can be used for different repeat-patterns:

- **One-Time Timer** (for a single day)
- **Daily Timer**
- **Weekly Timer**
- **Monthly Timer**
- **Yearly Timer**

The available settings of a timer depend on the type of timer.

It is important to understand that timers always work on a per day basis: First of all, a timer always has a **Validity Period**. This is a time span defined by a start and an end date during which the timer is (potentially) active. The **Time Window Within the Day** defines when the timer actually triggers a playlist during each day of the **Validity Period**. For a **One-Time** timer, the start and the end date are always the same. For a **Daily Timer**, the **Interval** setting defines on which days within the **Validity Period** the timer strikes. If this is set to "1" it will be applied for every day of the **Validity Period**.

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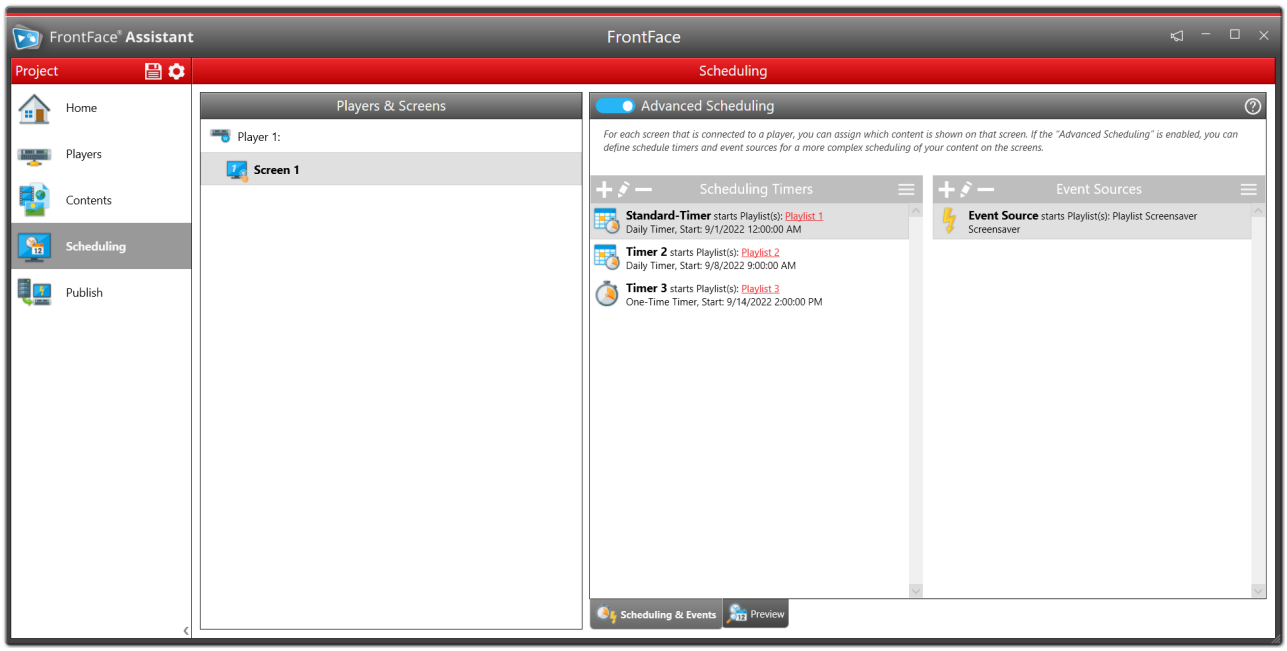
Notice: Please note that the concept of timers used in *FrontFace* does not allow to define one single timer that span multiple days if there is also a start and an end time: e.g.if it should start on 15-05-2019 10:00:00 and should end on 20-05-2019 16:30:00. To configure such as setup, you need three timers that all start the same playlist:
A "**One-Time**" timer for the fraction of the first day (15-05-2019 10:00:00 - 23:59:59), then a "**Daily Timer**" for the 4 full days (16-05-2019 - 19-05-2019) within the date range and one more "**One-Time**" timer for the fraction of the last day (20-05-2019 00:00:00 - 16:30:00).

Since timers are managed as list in the *FrontFace Assistant*, it can be difficult to determine which timer is active at a certain point of time and therefore which content will be shown. At the bottom of the "**Scheduling**" section, there is a "**Preview**" tab that shows a visualization of all timers in a calendar-style way. This way, you can easily check which playlist or touch menu is playing at a given date/time.



Overview of Scheduling Timers and Event Sources

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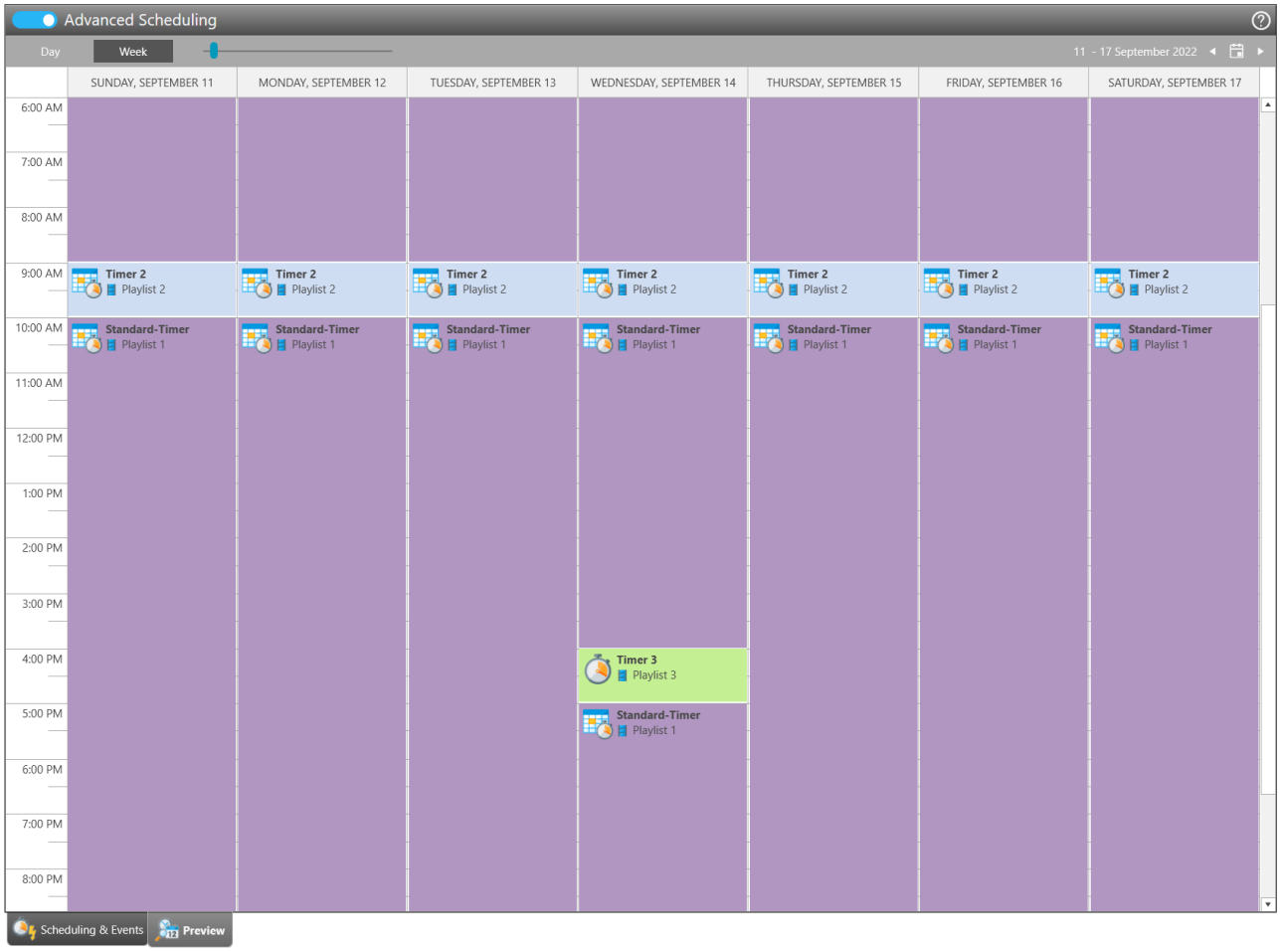

Preview of Scheduling Timers

When creating multiple timers, there is also a potential risk of conflicts: This means that two or more timers are valid at the same point of time and the *Player App* will not be able to determine which timer is actually the one that shall be used. Therefore, all timers have "**Priority**" property which you can change. It is an integer number (can also be negative!) and the timer with the highest priority is the one that is chosen by the *Player App* in case of a conflict. Unresolved conflicts are highlighted in red color in the "**Preview**" tab and will prevent that a player can be published.

A timer can be either set to "**Enabled**" or "**Disabled**". If a timer is disabled, it behaves as if it would not exist at all. This setting can be helpful if you want to define different scenarios with timers and do not want to delete/recreate them every time you make changes.

For all timers you can specify placeholders. Please see section Placeholders 139 for more details on this.

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6.6.2 Event-based Scheduling

Apart from timers, there is also another mechanism available in *FrontFace* to control which content is supposed to be shown on the screens: **Event-based Scheduling**. Instead of timers, so called **Event Sources** are defined by using **Event Source Plugins** 141. An event source generates events (e.g. triggered by an external system, a sensor, ...) which then trigger a playlist or a touch menu to be shown on the screen.

Timer- and event-based scheduling work together while events always have a higher priority compared to timers. Also, when an event is fired, the currently shown playlist (started by a timer) is paused and then the playlist triggered by the event is shown. Once the playlist ends, the timer-controlled playlist will continue at the point where it was paused before. This way, playlists started by an event can be used to show pop up information (e.g. a call up system) without ultimately terminating the currently playing content.

The options available in the settings dialog of an *Event Source Plugin* depend on the actual plugin. It is also possible to assign more than one playlist to an *Event Source Plugin*. However, this only has an effect if the actual plugin does support this. If not, always the first playlist that is assigned to the event source will be triggered in case an event is raised.

Event Source Plugins 141 are available for download on the mirabyte homepage. The *Screensaver Event Source Plugin* 138 is shipped together with *FrontFace*. It allows to create a screensaver by starting a defined playlist when there is no interaction with player for a certain period of time.

6.6.3 Publish Shortcuts (Windows Desktop)

If "**Advanced Scheduling**" is disabled, you can create **Desktop shortcuts** for publishing your content. This is helpful, if you have two or more playlists in your project and look for an easy way to switch between these playlists on the player. Normally, one would open up the *FrontFace Assistant*, load the project, select the playlist in the "**Scheduling**" section and then publish.

These steps can easily be automated: Simply click on the "**Create Publish Shortcut**" button next to the drop down menu for the playlist selection. This creates a shortcut on the Windows Desktop. When you double-click on that shortcut, the *Assistant* is loaded in the background and the playlist is published directly to the player. By creating two or more shortcuts for different playlists, you can use these to easily switch between the playlists on the player. Furthermore, if your playlists contain placeholders 139, these are queried during the publishing process.

Notice: You can use the "**Publish Shortcut**" feature in combination with placeholders 139 to set up a **simple welcome board system** to welcome visitors at your site. Instead of using a calendar/appointment driven approach as described here 12, this setup allows you to welcome visitors ad-hoc by double-clicking on a Desktop shortcut.

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6.7 Publishing

Once you have defined your infrastructure, created your content and defined when to play which content, you finally need to execute the publishing process which deploys the content onto the player(s). The *FrontFace Assistant* automatically compiles the required files and informs you about the progress and the result of the publishing process.

Navigate to the **"Publish"** menu section and click on the **"⇨ Publish!"** button. During the publishing process, all players that are configured in the current project will be updated. In case you only want to update a specific player or a specific player group, simply select the desired player from the drop-down list.

In the **"Players"** menu section of the *FrontFace Assistant*, you can also select for every individual player if you want to it to be skipped during the publishing process (see the settings dialog of the player). In this case, the player will only be updated when you select it explicitly from the drop-down list of the **"Publish"** section.

By default the option **"Use Intelligent Publishing"** is activated. This means that only those files are copied to the *Publishing Target(s)* of the player(s), which are new or which have changed since the last time the publishing process was run. This prevents that files have to be copied unnecessarily (e.g. large video files) if only small changes have been made to the project. When you deactivate this option, all files will be freshly copied to the *Publishing Target*.

FrontFace supports various publishing methods 50 which can be set individually for every player. You can choose the best method for you based on your infrastructure and your individual requirements.

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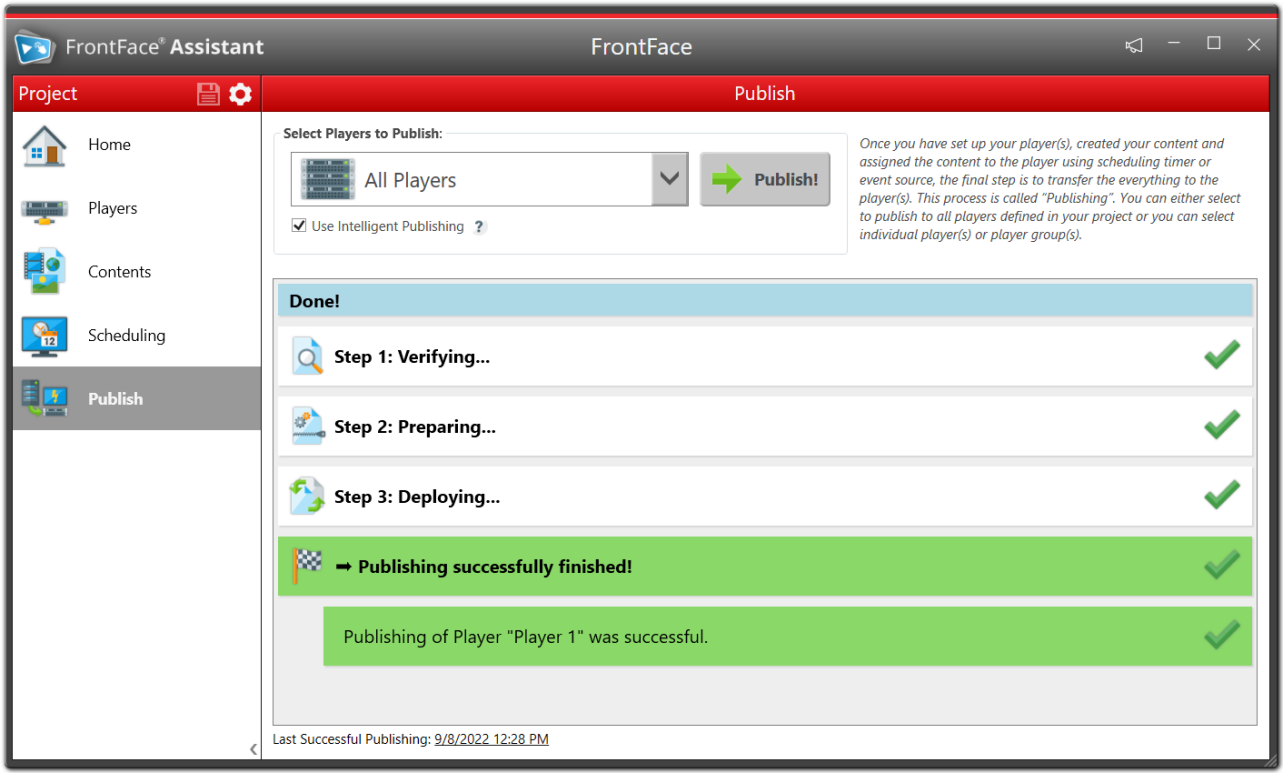

Output of the publishing log after publishing

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VII Features

7 Features

7.1 News Ticker, Clock & Weather

A scrolling news ticker tape, a clock and a weather status/forecast chart are popular components of digital signage applications. *FrontFace* has all these components built-in, ready-to-use!

⇨ Scrolling News Ticker Tape:

The "Scrolling Ticker" 108 media object can display either custom text entered directly in the *Assistant* or from a plain text file or RSS file that is stored either on a local file server or a Web server. Properties like colors, font style and scrolling speed can be adjusted individually.

⇨ Date/Time Clock:

The "Date / Time" 109 media object can show date & time as a digital or analogue clock or it can be configured as countdown clock or as an egg-timer. There are various options that you can use to configure the clock to your individual needs. In case of the analog clock mode, you can also select a custom clock face. Any PNG file can be used here.

⇨ Weather:

The built-in "Weather" 104 media object can display the current weather conditions and a 3-day-forecast for any location in the world. The location is set using geographic coordinates (latitude/longitude). An integrated location look-up helps you to find your location by entering the name. If your PC supports location-based services (e.g. built-in GPS module), you can also set the location coordinates automatically. The location name that is displayed can be adjusted freely and not necessarily has to be the name of the actual location. Furthermore, you can choose from different visual styles and different layouts and you can also configure other visual aspects such as colors, font style, etc.

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7.2 Print2Screen

Print2Screen is one of the unique features of *FrontFace* that allows you to easily integrate existing content in your playlists and touch menus or to keep using your favorite applications for content creation. Print2Screen uses the Windows printing system to seamlessly integrate with other applications. Any Windows application that supports printing can be used with Print2Screen; this includes popular applications such as **Word**, **Excel** and **PowerPoint** or even totally individual, custom vertical applications.

When installing the *FrontFace Assistant* on a PC, the Print2Screen printer driver is installed as well by default. In order to integrate content with Print2Screen into your project, simply open the project in the *FrontFace Assistant* and then open or create the content in the specific application (e.g. a slideshow in *PowerPoint*). Click on **"Print"** and select the **"FrontFace Print2Screen"** printer from the list of available printers on your system. Once the printout has been created, the *FrontFace Assistant* will notify you with a dialog popping up. You can choose to either use the latest printout as new content or to replace an existing Print2Screen content within your project.

If you want to use the printout as new content, head over to a page where you want to integrate the content and click on a container to select the **"Print2Screen"** media object. Then, click on the green button **"Select Recently Created Print2Screen Printout"**. In case of multi-page content you can also select a transition effect and the duration for each page of the document.

For even more design options, it is possible to select the option **"Transparent Paper"** which will replace the background color for your printout (usually white) with transparent so you can use it on overlay layouts 143 and composition the content with other content like images or videos.

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7.3 Hot Folder

Usually, when you integrate content files such as images, PDFs or videos into your project, a copy of the particular file is made which is stored in the project folder and which is physically published to the player PC. In order to update/replace such a content, you have to open the project in the *FrontFace Assistant* and go to the specific media object in order to replace/update it. After that, the project needs to be published again in order to reflect the changes on the player.

With **Hot Folder**, you can integrate "live" content into your playlists and touch menus. Simply create a shared network folder that is accessible for the players and then create a Hot Folder media object within your playlist or touch menu. You have to provide the UNC path to the shared network folder and also need to specify how long each file that is found in this folder is supposed to be shown on the screen.

Notice: Any file and and any folder in a hot folder with a file name starting with an underscore ("_") will be ignored. This is useful if you want to store files in a hot folder but want to temporarily hide them from being displayed.

If you only want to add a single file as media object instead of an entire folder, please also have a look at "**Symbolic Links**" in the section about file management 86.

Notice: You have to make sure that the player(s) can access the hot folder under the specified path in order to be able to display the content! Access must be granted to the Windows user account under which the player app is running.

When you publish your project, the actual files in the hot folder are not copied to the player(s). Instead, the player(s) will access the hot folder every time the hot folder media object appears on the screen. Any supported file found in that folder at this point of time will be shown in a sequence. The order is determined by the file names of the files in the folder (alpha-numeric sorting). If you have activated the "**File Explorer Mode**" (see below), the files found are displayed as buttons and can be selected and displayed interactively.

In order to "update" the content on the screen, there is no need to open/edit and publish the project in the *FrontFace Assistant*. Instead, you can just add, overwrite or remove files in the Hot Folder. This process can also be used for automatic content updates where external systems autonomously produce updated content files and copy these directly into the hot folder.

The following file types are supported by Hot Folder:

File Type	Extensions
Documents	`PDF, XPS`
Images	`PNG, JPG, SVG`

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File Type	Extensions
HTML	`HTM, HTML`
Videos	`MP4, MWV, ...`

The playback behavior of a Hot Folder media object in the context of a playlist depends mainly on the number of files in the Hot Folder and the **"Repeat Count"** property. The following matrix gives an overview:

	0 Files (empty)	1 File	> 1 Files
Repeat Count = Play Infinitely	The empty playlist page is displayed for the page duration. Nothing is displayed (black).	The playlist page is displayed for the page duration. The file from the hot folder will be displayed meanwhile.	The playlist page is displayed for the page duration. It will display the files from the Hot Folder until the playlist page has run out.
Repeat Count = 0	The empty playlist page is skipped (black for short).	The file from the Hot Folder is displayed (file duration of the Hot Folder media object), and then the page flips over to the next page.	The files from the Hot Folder are displayed in sequence (each with the file duration from the Hot Folder media object) and then the page flips over to the next page.
Repeat Count >= 1 (n)	The empty playlist page is displayed for the duration n * file duration of the Hot Folder media object.	The file from the Hot Folder is displayed (reloaded) n times, each time for the file duration set in the Hot Folder media object.	The files from the Hot Folder are displayed n times in succession (each with the file duration from the Hot Folder media object) and then the page flips over to the next page.

File Explorer Mode (interactive)

The **Hot Folder** can alternatively be used interactively by activating the so-called **"File Explorer Mode"**. If enabled, the files contained in the hot folder are not automatically displayed in sequence, but as small thumbnails/icons which the user can then interactively select for full-screen display. The layout to be used for the full screen display can be selected as well as the visual design of the thumbnails/icons.

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Customize file and folder names and icons: By default, the file/folder names of the files from the hot folder are used as labels. To customize the caption, assign a file or folder name that contains two square brackets and text to be displayed in between, e.g. **"P123456 [This text will be displayed].jpg"**.

To assign a custom icon add a file named **"_icon.png"** into folder of which you want to change the folder icon. For files, add a PNG file with the same file name as file of which you want to change the icon and append add the prefix **"_icon."** and the suffix **".png"**, e.g. **"_icon.myfile.pdf.png"** if the filen ame of the file where you want to change the icon is **"myfile.pdf"**.

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7.4 Screensaver

Specifically for interactive systems such as kiosk terminals, it may be desired to show something different on the screen (like ads or a call for action) if the system is currently not being used interactively. This feature is well-known from traditional PC systems as so called "screensaver". On Windows player PCs, it is still possible to use the Windows screensaver system for this purpose in combination with *FrontFace* but this has several down sides: First of all, you have to make sure that *FrontFace* does not disable the Windows screensaver which is the case by default (see Player Settings 61). Finally, you need a dedicated Windows screensaver application which is a standalone application and which does not integrated with *FrontFace*.

⇨ Screen Saver Event Source Plugin:

In order to overcome these limitations, *FrontFace* has its own, built-in screensaver functionality. The *FrontFace* screensaver is implemented as Event Source Plugin 129. You can configure a period of time with no interaction and select a playlist that is to be shown after the period has elapsed and no interaction (touch, mouse, keyboard) has happened. As soon as there is interaction again (e.g. the user touches the screen), the playlist will be stopped and the system returns to the previously shown content.

In order to use the screensaver, you have to install the Screensaver Plugin 141 that comes with *FrontFace*. The plugin can be found in the folder **`"C:\Program Files\mirabyte\FrontFace\Plugins\Screensaver.ffapx"`**. Once you installed the plugin, you can create an event source in the "**Scheduling**" menu section that uses this plugin.

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7.5 Placeholders

Normally, any text (such as in the *Text* 100 media object or paths and URLs set for other media objects) is entered statically in the *FrontFace Assistant* and then published to the *Player App*. However, there can be certain situations, where one would like to use placeholders that get filled dynamically with text on certain occasions.

FrontFace supports the use of placeholders for this purpose. Placeholders can either be filled/replaced during the publishing process or when a playlist is started by a timer or an event source. Placeholders are entered using the following syntax:

```
${placeholder name}
```

In the text editor of the *Text* 100 media object, there is a button that lets you enter placeholders using this syntax or you can select from a list of previously defined placeholders in your project.

Alternative places where placeholders can be applied are the paths and URLs media objects, such as images, videos, Web pages, etc. or the text field of the *Scrolling Ticker* 108 media object. This feature can also be used in combination with static files 156 or when you include files as symbolic links 89.

In order to use placeholders, you have to first insert the placeholders in media objects within your playlists.

In the next step, you have to assign the values to the placeholders. To do so, go to the **"Scheduling"** menu section of the *Assistant* and enable the **"Advanced Scheduling"**. You can use Timers 126 or Event Sources 129 to assign values to your placeholders:

⇨ Placeholders set by Timers:

A timer starts a playlist at a given point of time. Every timer type (daily, weekly, etc.) has a tab **"Placeholders"** in its settings dialog. Here you can select the placeholders that you have used within your playlists and either enter a text value directly or select **"Ask for Text on Publishing"**. In that case, the text value will be queried during the publishing process. This can be used e.g. for "manual" or "ad-doc" visitor welcome boards 12 where the name of the visitor is entered manually and then shown at the moment, when the welcome screen is switched.

⇨ Placeholders set by Event Sources:

Event Sources can set placeholders within playlists as well when an event is fired. It depends on the type of event source plugin that you are using how placeholders are filled. Either the event source plugin defines the names of the placeholders that you can use (e.g. the **"Calendar Plugin"**) or you can configure the placeholders in the settings dialog of the event source plugin. Event-based placeholders can be used for calendar-driven visitor welcome boards 12 where not only date & time but also the name of the visitor are taken from an external calendar, such as an *Exchange Server*.

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Information: Placeholders are applied either during the publishing process or by timers/event sources at runtime. Therefore when showing a playlist or touch menu in preview mode, placeholders are not applied (unless you are doing a "Player Preview" 64 where timers and event sources are also active!). To test placeholders when running the normal "Content Preview" 125, you can define custom placeholder values for testing purposes in the settings dialog of the content preview 125!

Built-in Placeholders:

In addition to the user-defined placeholders, there is also a set of built-in placeholders that are automatically filled at runtime. You can use these placeholders to provide contextual information in your playlists, pages or media objects. The built-in placeholders are:

Placeholder	Description
`${F_PLAYERID}`	ID of the current player
`${F_PLAYERNAME}`	Name of the current player (as defined in "Players")
`${F_SCREENID}`	ID of the current screen
`${F_SCREENINDEX}`	Index of the current screen
`${F_CURRENT_DATE}`	The current date in the local short format, e.g. 02/28/2020

You can use the built-in placeholders to e.g. create a single playlist that is used on all players of a project but where a certain media object (e.g. a Web page) is parametrized by the name of the player on which the Web page is actually shown. Therefore, the `${F_PLAYERNAME}` placeholder is used within the URL of the Web page media object (e.g. `"https://in-the-internet.com/?id=${F_PLAYERNAME}"`). Alternatively, you can define your own placeholder and then assign it a value specific to the player in the scheduling 126.

For the use in Toolbar 119 media objects, there are also predefined placeholders available.

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7.6 Plugins

FrontFace already covers a very broad range of possible use cases and application scenarios. However, due to the manifold field of applications for digital signage and kiosk software, there are still uses cases where the functionalities and features of *FrontFace* may not be sufficient. In order to address this aspect, *FrontFace* comes with a plugin interface that allows extending the application with custom functionality.

Plugins for specific uses cases are available for download on the FrontFace Product Website. In addition to that, a **free Plugin SDK (Software Development Kit)** is available that can be used to create custom plugins with programming languages like C# or VB.NET.

There are two types of plugins:

Content Plugins
Content Plugins are displayed on the screen within a playlist and can be integrated into page or screen layouts like normal media objects. The *Calendar Plugin* for example can access external calendar data sources like an *Exchange Server* and display appointments or room occupancy plans on the screen.

Event Source Plugins
Event Source Plugins are used to integrate external systems or devices that trigger the start of a playlist. The *Calendar Trigger Plugin* for example queries an external calendar data source like an *Exchange Server* and triggers the start of a playlist if an appointment in the calendar becomes due. This can be used e.g. for personalized welcome boards.

Service Plugins
Service Plugins provide a background service or general function and are installed per player. The *Analytics Plugin*, which can be used to track the usage of an interactive terminal or the actually played content of a player, is an example of a service plugin.

Plugins are provided as a file with the file extension **`.FFAPX`**. You can download these plugin files from the *FrontFace* Website.

In order to install a plugin, you first have to open or create a project in the *FrontFace Assistant*. Plugins are always installed per project. So if you download and install a plugin in one project, it is only available in that project. To use the same plugin in another project, you have to install it in that other project as well.

⇨ Installing Content Plugins:

Go to a playlist page an click on an empty container in order to select a media object for that container. Select "**Plugin**" and click "**OK**" in order to make the dialog appear that shows the list of currently installed content plugins of your project. Click on "**Install Additional Content Plugin**" and select the **`.FFAPX`** file of the plugin you want to install. Once the plugin has been installed, it appears

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in the list of available content plugins. Then, select the plugin from the list. The plugin itself behaves like any other media object. Therefore you can open up a settings dialog for configuring the plugin instance. The settings that are available depend on the plugin that you have installed. Please refer to the manual that comes with the plugin for further details.

⇨ Installing Event Source Plugins:

Head over to the "**Scheduling**" section in the main menu of the *FrontFace Assistant* and make sure that you have enabled the "**Advanced Scheduling**". Click the "**+**" button above the list of event sources to add a new event source. The dialog shows a list of all currently installed Event Source Plugins. Click on "**Install Additional Event Source Plugin**" and select the **.FFAPX** file of the plugin you want to install. Once the plugin has been installed, it appears in the list of available event source plugins. Then, select the plugin from the list. After that, the settings dialog of the plugin appears where you can configure the plugin (e.g. set the address and the credentials of a remote system that generates the events you want to subscribe to).

⇨ Installing Service Plugins:

In *FrontFace Assistant*, select the "**Players**" section and click the "**+**" icon in the "**Services**" list to install a service plugin. Already installed service plugins appear in the "**Services**" list. Click on the pencil icon or double-click to open the settings dialog of the respective service plugin. Service plugins can also be deactivated in their settings dialog if required.

Managing and Updating Plugins: In Project Menu 39 there is a "**Manage Plugins...**" menu item. Here, you can get an overview of all currently installed content and event source plugins of your project. It is also possible to install both content and event source plugins in this dialog as well. In order to install an updated version of a plugin in your project, simply select the **.FFAPX** file of the new version and install it the same way as new plugins. The *FrontFace Assistant* will detect the old version of the plugin and replace it with the new one. You do not have to update your playlists or event sources since these get updated automatically! You can also uninstall plugins that have already been installed if necessary: To do this, right-click on the corresponding plugin in the list of installed plugins.

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7.7 Overlay Layouts

Page Layouts 82 and Screen Layouts 82 partition the available screen into areas called **"Containers"**. These containers can be filled with media objects such as images, videos, PDFs, Web pages, etc.

Containers may also overlap and can be stacked in a defined order. This way you can create tiered or layered screen content. Since a container is always transparent, the filled-in media objects can either cover each over or, if their background color is set to transparent or the opacity of the media object is not set to 100%, a covered media object can be revealed.

The layouts that are shipped with *FrontFace* contain a section with **"Overlay Layouts"**. These are predefined layouts where containers overlap each other. The overlay layouts can be used to accomplish certain design tasks, e.g. :

- **Placing a "TV station logo" in a corner of the screen:** By assigning a PNG logo with transparent background, the logo appears over the actual content that is shown in the background container.
- **Creating a semi-transparent or transparent scrolling ticker:** By assigning a ticker and setting its background color to either fully-transparent or semi-transparent, the text of the ticker will scroll over the actual content that is shown in the background container.
- **Showing content inside a frame with a background/wallpaper:** The background container is filled with a background artwork ("wallpaper"), e.g. a picture (e.g. created from an empty *PowerPoint* slide!) or a video with a background animation. The foreground container is filled with the actual media object, e.g. another picture, a Web page or a text media object. Especially when using a text media object, you can set its background color to transparent. That way, the text appears on top of the background/wallpaper image.

Since it is possible that containers may overlap each other it can happen that you are not able to click a container in the *Assistant* using the mouse in order to add or edit a Media Object to it. For this purpose, there is the [=] button that displays a (flat) list of all containers in the current layout. The list items can be clicked in the same way as the actual containers in the schematic view of the *FrontFace Assistant* in order to edit the Media Object of that container.

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7.8 Click2Zoom

Click2Zoom is a very helpful feature for applications such as interactive blackboards where rather small media objects are presented which a user might want to view at a larger scale for better readability. By enabling *Click2Zoom* for a media object, the user can click or tap on it in order to make it appear in full screen mode. Using a "**Close**" button, the user can return to the previous content. Paging for multi-page media objects such as PDF or Print2Screen documents is also supported in full screen mode.

The *Click2Zoom* feature can easily be enable for most media objects, simply by ticking the "**Enable Click2Zoom**" check box. Alternatively, you can manually add a "**Click2Zoom**" action to the list of "**Click**" actions of the media object. This way, you can also customize the layout that is used for the full screen mode (e.g., if you want to apply a different toolbar).

Optionally, you can also specify a "**cover image**" for a Click2Zoom-enabled media object. The actual media object will then be replaced by the cover image in the page's layout on the screen. If the cover image is clicked, the original media object will be shown in full screen mode. This feature is useful, e.g. if you want to resemble a digital blackboard where the media objects represent the paper notes on the board but are actually not perfectly suited for such as setup (e.g. a Web page).

Furthermore, a "**Display Duration**" (in seconds) can also be specified, after which the full screen mode is automatically terminated. This setting can prevent a content displayed with Click2Zoom in full screen from being permanently displayed on the screen by mistake.

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7.9 Printing and Sharing

Any media object that is shown in a touch menu also optionally supports printing or sharing (e.g. by email).

In order to use this feature, any media object that is supposed to be either printed or shared need to be enabled for content sharing. In the settings dialog of each media object 86, the content sharing option can be enabled (only available if Expert Mode 44 is enabled!).

In addition to that, the toolbar 80 of the Content Viewer Layout 82 of the touch menu 73 requires a toolbar button to allow the user to print or share the displayed content. By default the included content viewer layouts contain a "**Print**" button that becomes visible if a media object is displayed where content sharing is enabled. A "**Send Content to Printer**" action is executed when the toolbar button clicked. Instead, you can also assign a "**Send Content by Email**" or "**Send Content to App**" to a toolbar button if you want to allow a different type of content sharing.

The "**Send Content to Printer Action**" prints the media object on the system's default printer. You can use the Windows settings to define the default printer.

The "**Send Content by Email**" action sends the media object as file attachment by email to an email address that the user needs to enter. A SMTP server and mailbox credentials need to be provided for this action.

The "**Send Content to App**" lets you execute a custom application (EXE) and pass the file name(s) of the media object(s) as command line arguments for custom integration scenarios.

For more information, please see the section about Actions 121.

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7.10 Image Maps

The **Image Map** feature is an alternative representation of a menu level within a touch menu 73. Instead of buttons 75 that represent the sub menu items in the navigation, an image map shows a visual (e.g. a wallpaper image) that has touch-sensitive zones that the user can click on. A typical example for the use of an image map is a plan or a map of e.g. a theme park which shows different rides on which the user can click on to get further, detailed information.

For more details on using this feature, please see section Touch Menus > Image Maps 77.

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7.11 Background Music

It is possible to assign a **background music** to your playlists, playlist pages or touch menus. Supported formats are MP3, WAV and audio streams (MP3, M3U, ASX, etc.). Please see the sections about playlists 67, playlist pages 69 and touch menus 74 for details.

Another option to integrate is audio is the **"Play Audio File"** action 121 that can be executed when a playlist is started/stopped or when a page is shown.

Finally, there is also an "Audio" media object 92 available that lets you integrate audio files into pages.

These two options for playing audio files can also be used for buttons in a touch menu that play audio when a user clicks on it. But each method behaves differently depending on whether the button in the touch menu contains content (pages) or not:

- If you want to add a button to a touch menu that does nothing else than playing an audio file, when the user clicks on it, you have to use the **"Play Audio File"** action 121 on the *"Start Action"* of that button. In this case the audio file is only played once (when the button is clicked) and not looped.

- If you also want to show content while the audio is playing, you should use the background music option of the button and add the desired content as page(s) to the button. As long as the content is shown, the background music will be played. In this case it is also looped automatically.

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7.12 Embedding Playlists in other Playlists

It is possible to embed a playlist as media object in a page of another playlist. This gives you several interesting options that you can consider if you are creating your content:

⇨ More Complex Layouts:

By default, a playlist can have a screen layout that remains the same during the entire display time of the playlist and each page has a page layout that defines how the individual page is being partitioned.

For even more complex layouts, it is possible to embed an existing playlist as media object into another playlist. Please note that some restrictions apply here: The embedded playlist may not contain other embedded playlists and no reference to the embedding playlist. This restricts the level of embedding to one. We have defined this restriction to prevent circular references and to increase the display performance.

⇨ Linking Playlists:

In order to link two playlists, simply create a third one with two pages that embed the playlists you want to link in full screen pages. Now, when running the newly created playlist, you will first see the first playlist, followed by the second before the first starts again. Of course you can use this technique to also link more than just two playlists.

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7.13 Onscreen Keyboard

FrontFace includes a **virtual keyboard component** (onscreen keyboard) that can be used to enter text on player systems where no physical keyboard is present but a touch screen.

The onscreen keyboard (OSK) component is installed by default but needs to be enabled explicitly for each player. In the advanced player settings 61, check the setting to enable the OSK on the player to do so.

If you are running the preview 125 of a Touch Menu 73 or Playlist 67, there is an option to start the OSK service as well during the preview session.

By default, the predefined Content Viewer Layouts 74 that are available for Touch Menus 73 include a toolbar 80 with a button that allows toggling the onscreen keyboard. The onscreen keyboard can be used to enter text within the *FrontFace Player App* (e.g. a password for a protected page or menu button or a from within a Web page) or in combination with external applications that are started by *FrontFace* using the External Application 113 media object.

The OSK uses by default the layout or the current language/locale of the system. It is possible to make modifications to the onscreen keyboard component. For details, please contact mirabyte technical support 189.

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7.14 Integrating External Applications

Using the "External Application" media object, you can also integrate external Windows applications (EXE files) into your playlists and touch menus. This section describes how you can use the *External Application* media object to integrate *VLC* and *Excel*.

⇨ Integrating VLC Video Player as External Application:

You can use *VLC by VideoLAN* to embed video content as overlay into your playlist pages. This may be desired if you want to display certain video content that is otherwise not be compatible with the video/streaming features supported by *FrontFace* directly (e.g. special types of Web Cams, etc.). Due to a bug in VLC command line processing, you have to install version 2.0.8. Otherwise, the placement of the window (unless you want to use full screen mode anyway) will not work as expected. You can download this version of VLC here: http://www.vlc.de/vlc_archiv.php

Please specify the path to the **"VLC.exe"** file as path to the EXE file in the settings dialog of the **"External Application"** media object. As command line, please enter the following:

```
-X -I dummy --dummy-quiet --width=%WIDTH% --height=%HEIGHT% --video-x=%X% ↵
-video-y=%Y% --no-video-deco --no-embedded-video --video-on-top ↵
--no-videotitle-show "%STATIC%\videofilename.mp4"
```

Replace `"videofilename.mp4"` with the name or the URL of your video file. The file itself needs to be copied into the `"\Media\Static\"` folder of your project. When the playlist page with your media object is shown, it will launch VLC in a border-less mode and place the video at the same position on the playlist page, where the "External Application" media object is located. It is also possible to run multiple instances on one playlist page to show multiple videos on the same playlist page using this technique.

⇨ Integrating Excel as External Application:

In order to display *Excel* files, you have to enter the path to **"Excel.exe"** as path of the EXE file in the settings dialog of the **"External Application"** media object. As command line arguments, enter the path to your Excel file in quotation marks and add the command line switch `/e` to prevent the Excel splash screen from appearing while Excel loads, as well as `/r` to make Excel load the file read-only:

```
/e /r "c:\path\to\your\excel file.xlsx"
```

For a full list of all Excel command line switches, please see: https://support.office.com/enus/article/Command-line-switches-for-Excel-321cf55a-ace4-40b3-9082-53bd4bc10725
Furthermore, you should prepare the player PC by starting *Excel* for the first time manually and set the ribbon user interface to "auto-hide". When Excel is then started automatically by *FrontFace*, only the actual spreadsheet (content) appears and not the full ribbon user interface and the window title bar.

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7.15 Integrating YouTube Videos

Since *FrontFace* has an integrated Web browser that also supports HTML5, it is possible to also integrate *YouTube* videos into your playlist. Simply create a new "Web Page" 94 media object.

Visit the *YouTube* Website (https://www.youtube.com) and pick a video you would like to embed. You have to identify the video ID of that video and you have to write down the length of that video. The video ID is part of the URL (which is shown in your browser's address bar). The length of the video is shown on the *YouTube* page itself.

Example:

Let's assume you would like to embed the YouTube video from this page:

```
https://www.youtube.com/watch?v=C4ilc5y3aLQ
```

In this case the video ID is **C4ilc5y3aLQ**.

Now, add a new page to your playlist in the *FrontFace Assistant* and add a new "Website" media object to that page. Enter the following string as URL:

```
https://www.youtube.com/embed/VIDEOID?autoplay=1&controls=0&showinfo=0
```

Make sure that you replace **VIDEOID** with the video ID you have just identified. So the full URL you have to enter is:

```
https://www.youtube.com/embed/C4ilc5y3aLQ?autoplay=1&controls=0&showinfo=0
```

Finally you have to set the duration of the playlist page with the *YouTube* video to the length of that video. Since the *YouTube* video is streamed from the Web, *FrontFace* can otherwise not detect when the video has ended.

Notice: If you want to embed a **YouTube live stream** instead of a normal YouTube video, you will receive a message that your browser does not support playback if you proceed as described above! The reason is that the Chromium browser integrated in *FrontFace* is not allowed to use certain video codes for licensing reasons. In this case, please also select "**Internet Explorer**" as the browser engine in the settings dialog of the Website media object to allow playback of a YouTube live stream.

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7.16 Web Page Scripting

There are certain situations where displaying Web pages, even on a non-interactive system, still requires some kind of interaction. Typical examples are “cookie banners” that almost every page displays where the user has to give consent. Displaying such pages on a digital signage screen is problematic since the cookie banner covers a part of the actual page or even the entire page, which makes is useless on the large screen. So, there is the requirement to “click those banners away” which is simply not possible on non-interactive systems.

Another example is Web pages that require a login, and which do not support standardized login methods such as *Basic Authentication*. In these cases, the user has to fill in user name and password into text boxes on the page and clicks a submit button.

FrontFace can display Web pages as part of a playlist or a touch menu and allows to automate these interactive processes to a certain extent. In order to support the use cases stated above, it is possible to execute a custom JavaScript after the Web page has fully loaded to automate actions such as clicking on a cookie banner or filling and submitting a login form.

Notice: Due to the complex nature of this subject, the use of this feature requires basic *JavaScript* programming skills and an understanding of the anatomy of *HTML* pages (*DOM – Document Object Model*). If you are not familiar with these terms, we recommend seeking the support of an expert in these Web technologies to help you.

In the settings dialog of a **Web Page media object** 94, you have to enable the **“Expert Mode”** 44 in order to access the “**Scripting**” tab. Here you can enter a JavaScript that is executed once the page has fully loaded.

A few very simple JavaScript templates are already included, one for clicking cookie banners and one for forms-based authentication.

You will always have to customize these templates in order to work with the Web page you want to display. The most important part of the customization is to determine the CSS selectors of the elements of the DOM tree that you want to manipulate (such as links, buttons, text boxes, etc.).

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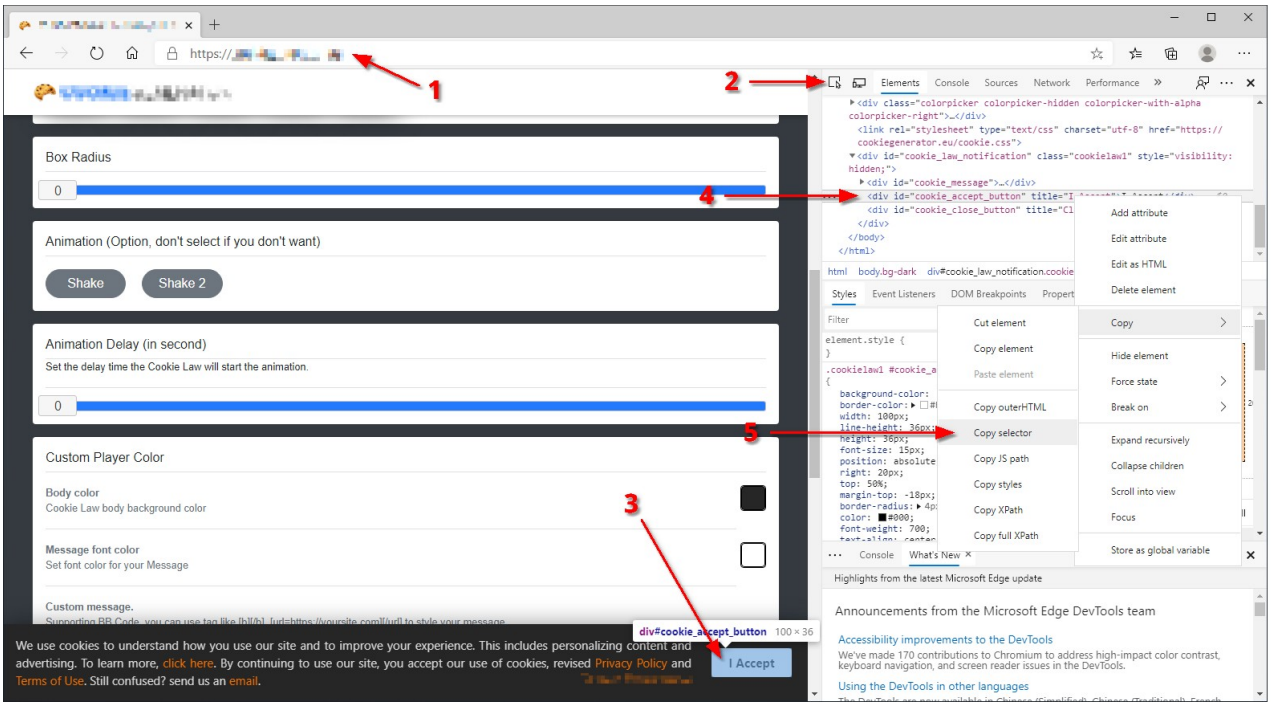
We recommend the following procedure:



1. In the settings dialog of the Web Page media object, enter the URL of your Web page and select the desired JavaScript template from the "**Scripting**" tab.
2. Open the *Microsoft Edge* browser (the Chrome-based version!) and enter the URL of the page here as well (1). Once the page has loaded fully, press **F12** to open the developer tools.
3. Click on the "**Select an element on the page to inspect it**" button (2) and click on the element in the page (3) you want to identify. Make sure that the correct element in the DOM tree on the right side (4) is selected then.
4. Right-click on that element in the DOM tree (4) and select from the context menu "**Copy**" > "**Copy selector**" (5).
5. Head back to the settings dialog of the Web Page media object in the *FrontFace Assistant* and replace the selector expression of the element in the script with the code from the clipboard. Instead of the placeholder selector in the script, such as `"#button"` simply paste-in the new selector. For example, this may look like this: `"#id-top > div.id-SiteBEEPWrap > div > div.id-CookieConsent > div > span"`

Once all selectors have been set correctly in the JavaScript code, you can choose if you want the JavaScript to be executed only on the very first page loading or also on consecutive loading events. Some pages may reload themselves e.g. to redirect to a login form etc. In such a case you have to make sure that you JavaScript code also gets executed on consecutive page loads. By checking if a DOM element that you want to manipulate is actually available on the currently loaded Web page, you can even handle multi-page login procedures that some Websites use.

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Notice: Since no error messages are shown at runtime in the *FrontFace Player App* or preview, it is relatively hard to debug the JavaScript. We recommend using the JavaScript console of the F12 developer tools of the *Edge* browser to test the JavaScript first.

Using Login and Password in a JavaScript:

Due to security considerations, it is not recommended to enter passwords as plain text in the JavaScript code. Instead, you can use the placeholders `${F_WEB_LOGIN}` and `${F_WEB_PASSWORD}` in your JavaScript code. At runtime, these placeholders are replaced by the values you have entered in the "**Basic Authentication**" section of the settings dialog of the Web Page media object. The password is stored AES-encrypted so that you get at least some basic security.

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7.17 Protected Content

Paylist pages 69, pages 79 within a touch menu button as well as touch menu buttons 75 can be protected by restricting access to them. If the **access restriction** is enabled, the content is not shown as normal but the user is prompted to authenticate first.

Two different modes are supported for protecting content:

⇨ Static Password:

You can simply enter a password that the user will have to enter (using a physical keyboard or the onscreen keyboard) in order to view the content. The password is stored in an encrypted way, but please keep in mind that this no high security solution.

⇨ List of Passwords or IDs from File:

You can also provide the full path to a plain text file (e.g. using a UNC path pointing to a network share) that contains a list (line-by-line) of passwords or IDs that are supposed to be accepted. In contrast to the static password method, no text box is shown to the user for entering a password. Even though keyboard input is still expected. The reason for this behavior is that the ID or password is not supposed to be entered manually, but by using a keyboard emulation device such as a bar code scanner or an RFID reader. These devices read the ID from the bar code or tag and emulate an keyboard input sequence followed by a CR (carriage return). *FrontFace* will take this input and check if the scanned ID is in the file that is provided. If the ID was found, the access to the content is granted. The advantage of this setup is that you can easily add or removed authorized users at any time by modifying the file with the ID list. Since this is a plain text file with no encryption, please keep in mind that is no high security solution.

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7.18 Static Content

When you add a media object, such as an image 90 to your playlist or touch menu, the selected file is automatically copied into the **"\Media\"** folder of your project and is then deployed to the player upon publication.

There are some cases when you need to add extra files that need to be published to the player as well. One example is a Web site that is not hosed on a Web server that consists of several files (html, css, images, etc.). But there are also plugins 141 like the *Calendar Plugin* that may require an additional file such as an Excel spreadsheet file.

These files are referred to as **"static" files** and can easily be published to your player by adding the file to the **"\Media\Static\"** folder of your project. Any file or folder that resides in this folder will be published to all players of your project automatically.

In order to reference such files within your project, you always have to state the path *relatively* to the **"\Media\"** folder. E.g., if you have added a file **"\Media\Static\Test.html"** to your project, you have to reference this file inside the *FrontFace Assistant* using the following path: **"Static\Test.html"**

Notice: When you embed a HTML document as static content, please remember to also enable the "**Allow local sources (file:///)**" setting in the settings dialog of the "Web Page" 94 media object! Otherwise, a message will appear on the screen telling you that the content has been blocked.

⇨ Usage Example:

In this example, we show how to use images files stored in the **"Static"** folder in combination with placeholders 139. First, copy the images files (e.g. **"image1.jpg"**, **"image2.jpg"**, **"image3.jpg"**) to the **"\Media\Static\"** folder of your project. Then, add a new page and select an "Image" media object 90. When the file picker dialog for selecting an image appears, click on "**Cancel**" and enter the path the image file manually with a placeholder for the file name: **"Static\${image}.jpg"** and click "**OK**".
When you now publish your project or assign the content to a timer, you need to provide a value for the placeholder. If you enter **"image1"**, you will see **"image1.jpg"** on the screen and if you enter **"image2"**, the player will show **"image2.jpg"**, etc.

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7.19 Player-Specific Content

The content (playlists or touch menus) is assigned to the player screens in the Scheduling 126 section of the FrontFace Assistant. If a network is operated with multiple players, there is often a requirement that not all players should show the same content, but that some parts of the content should be identical for all players. Creating an individual playlist or touch menu for each player would require a high administrative effort, especially if only small parts of the content differ among the players.

By using the **"Visibility"** function for touch menu buttons 75 or playlist/button pages 69, a convenient, **player-specific content management** can be easily achieved:

The basic idea here is that only one playlist or only one touch menu is created, which is used for all players. This means that all players initially display the same content. If an additional menu button is to be displayed in a touch menu only on one of the players but not on all other players, this button is added to the touch menu as normal and then the **"Visibility"** setting in the settings dialog for the button 75 is used to specify that it should *only* be displayed on certain players. Alternatively, you can also specify that the button should *not be* displayed on certain players.

The visibility of pages can also be controlled in the same way. This can be done either in the context of playlists (certain pages 69 are then only or not displayed on certain players) or in the context of the pages of a touch menu button 75.

If you want a touch menu button to be visible on all players, but display different player-specific content when the user clicks on the button, the button can be given the **visibility state "Visible"** and the different content can be stored in the form of several pages within this button. The **visibility** for the desired player is then activated for each page so that only one of the pages is effectively visible per player.

In addition to the player-specific visibility of buttons and pages, time-controlled visibility can also be set.

To test the effects of the visibility settings, you can either specify the player for which the display is to be simulated or the time that is to be simulated in the settings dialog of the preview function 125.

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7.20 Keyboard Shortcuts & External Input Devices

FrontFace allows that pages 69 of a playlist or menu buttons 75 of a touch menu can be called up via **keyboard shortcuts**. This feature can be used to e.g. actively intercept a presentation and display a specific page or specific content. Keyboard shortcuts can also be used to set up a touch menu in a way so that it can be navigated using a keyboard without requiring a touchscreen or a mouse.

To be able to use the keyboard shortcut feature, you must first activate the expert mode 44 in the *Assistant*.

Notice: The *FrontFace Player App* uses some predefined keyboard shortcuts 178 as well. Please notice that these shortcuts always have priority compared to custom defined keyboard shortcuts for playlist pages or touch menu buttons!

Keyboard shortcuts for playlist pages:
Select the desired shortcut in the settings dialog of the page 69. Make sure that you do not assign the same shortcut more than once within a playlist. Pages that are marked as "hidden" in the page visibility can still be displayed using keyboard shortcuts. This way, you can configure special pages that are only displayed when a certain key on the keyboard has been pressed. A page that was displayed using the keyboard shortcut is displayed for as long as configured in the page settings for that page.

Keyboard shortcuts for buttons in touch menus:
Touch menus can also be controlled using the keyboard. A keyboard shortcut can be assigned for each menu button in the settings dialog of that button 75. In a touch menu, you can also assign the same shortcut to multiple menu buttons. If the key on the keyboard is pressed, the *Player App* first checks whether the shortcut in question has been assigned to a menu button on the current menu level at which the user navigates. If this is not the case, a global search for a corresponding button with this shortcut is performed within the entire menu tree. This allows you to use the same keyboard shortcuts again on every menu level. Finally, in the settings dialog of the touch menu 74, you have the option of storing two additional shortcuts for *returning to the start page* of the menu and for *closing the content viewer* 79. These shortcuts apply to the entire touch menu.

Notice: Keyboard shortcuts only allow you to navigate within a playlist or a touch menu. It is not possible to start playlists or touch menus using a shortcut. If you require this functionality, please use the **Remote Control Plugin**, which is available separately.

Use of external input devices:
You can use the keyboard shortcut feature to assign all keys of a connected keyboard that have a "virtual key code". In some cases it may be of interest to use special hardware for input, e.g. proprietary keypads. These can be used with *FrontFace* if they support keyboard emulation. That means that the press of a key on the device corresponds to the pressing specific key on a "normal" keyboard.

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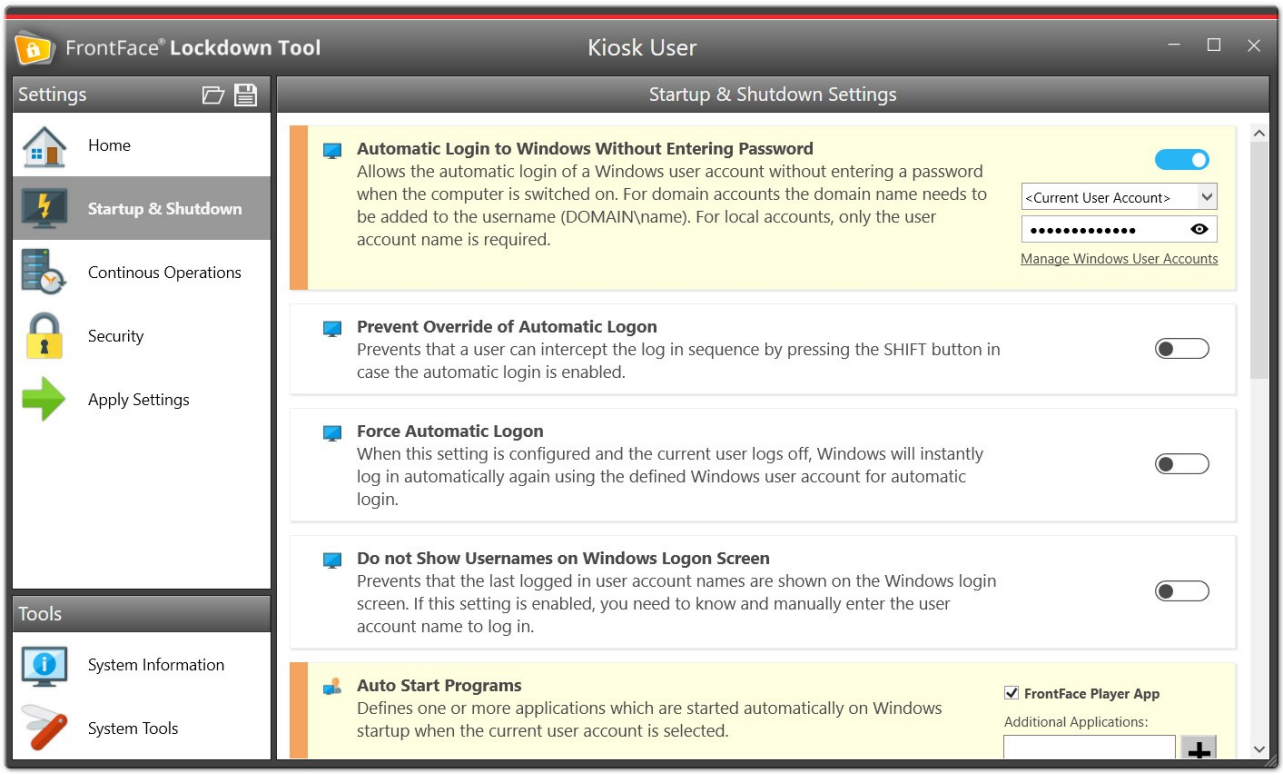
VIII Advanced Configuration

8 Advanced Configuration

8.1 FrontFace Lockdown Tool

Since a player PC is usually not used interactively with mouse and keyboard, it is recommended to configure the player PC in a way that it boots automatically without requesting a password and that the *FrontFace Player App* is also started automatically. In case of kiosk terminals, the PC though is used interactively but also, an automated starting sequence is desired plus additional modifications that secure the system against unintended use are required.

The easiest way to configure a Windows-based player or kiosk PC is to use the free ***FrontFace Lockdown Tool*** (`Lockdown.exe`), which can be installed optionally with *FrontFace* or which can also be downloaded separately: https://www.mirabyte.com/go/lockdown/



FrontFace Lockdown Tool

Simply start the *FrontFace Lockdown Tool* on the player PC and select the predefined profile "**Digital Signage Player PC**" or "**Interactive Kiosk Terminal**" on the welcome page of the application. Then, click on "**Load Profile**" and finally click on the button with the check mark ("✔") in the main menu of the *FrontFace Lockdown Tool* to apply the profile. Please make sure that you select the right Windows user account. It is recommended to create a separate "standard" (non-admin) type user account under Windows for running the *FrontFace Player App*.

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8.2 Automatic Startup and Shutdown

A typical requirement for digital signage and kiosk systems is the automatic, time-controlled startup and shutdown of the player. Since *FrontFace* (in the Windows version 27) is based on the Windows operating system, such functions are implemented via the operating system.

Windows has the so-called **"Task Scheduler"** with which programs and functions can be executed automatically at certain times. Complex repetition patterns are also possible. With the help of the Windows task scheduler, the start-up and shutdown of the PC can also be automated.

FrontFace comes with the includes the *FrontFace Lockdown Tool* 160, which can also be used to conveniently set up this function.

Before you start, you should first check whether your PC has a BIOS / UEFI with which the PC can be started automatically. If this is the case (e.g. this is the case with intel NUC PCs), you should at least use this function for the automatic start of the PC, as this function is much more robust than the use of Windows task planning, as it controls the PC before it is executed must first wake up (see below).

Automatic start of the PC via the BIOS / UEFI:

1. Start the PC and wait for the Windows login screen to appear.
2. However, do not enter your password, but click on the power button at the bottom right.
3. Hold down the Shift key and click the **"Restart"** option. The UEFI will now open.
4. Find the settings for the automatic start in the UEFI and set these according to your wishes and finally save the settings.

If you have configured the automatic start via the UEFI, you can set the automatic shutdown with the *FrontFace Lockdown Tool*. To do this, set the time for **"Daily Shutdown"**. A shutdown task is then created in the Windows task scheduler. If necessary, you can refine this setting later in the Windows task planning (e.g. only Mon-Fri). For more details, see below.

Automatic start of the PC with the Windows on-board tools:

If your UEFI does not have a function for automatic, time-controlled starting, you can still “emulate” this function with Windows on-board tools. To do this, the PC is not automatically shut down, but instead put into hibernation. In this state, Windows task scheduling remains active, even if the PC appears to be switched off. Thus, with the help of the Windows task planning, the PC can be woken up at the start time and a restart of the system can be triggered, so that you have a freshly started system at the set time.

1. Start the *FrontFace Lockdown Tool* and set the time for switching off the PC under **"Daily Hibernate"**. Also set the start time for the PC under **"Daily (Re)boot"**.
2. In order for both to work, Windows may have to be activated in hibernation. You can do this by running: `powercfg.exe / h on`
3. You must also select the **"Allow wake timers"** function in the Windows power settings so that you can wake up from hibernation.

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In addition to the automatic start and shutdown of the PC, the automatic login without entering a password and the automatic start of the *FrontFace Player App* are important. You can easily set up these and many other options with the *FrontFace Lockdown Tool* 160.

Customizing Windows Task Scheduler Automation Tasks

The *FrontFace Lockdown Tool* 160 creates a task with a daily repetition pattern in the Windows task scheduler for automatic start-up, shutdown or hibernation. If you want a more nuanced repetition pattern, you can customize these tasks. To do this, start the **Windows Task Scheduler** via the start menu and search for tasks that begin with the prefix **"MBFFLDT_"**. You can then adjust these according to your wishes (e.g. daily start-up / shutdown only Mon-Fri).

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8.3 Software Deployment and Update Installation

The installation of *FrontFace* (either new installation or upgrading of existing installations) is done using the installation package (setup): **`frontface.exe`**

When you execute the installation package, the *FrontFace Setup Wizard* will guide you through the installation or upgrade process.

Information: To upgrade an existing *FrontFace* installation, you need to obtain the installation package of the new version and execute it on the system with the old version. Your existing configuration and also the currently published content will remain during the upgrade process. Please note that it is very important that you upgrade ALL of your *FrontFace* installations: This covers both players and PCs, where the *FrontFace Assistant* is installed!

You can only install a newer version over an older version. Only, when upgrading from a trial version to a full version, you can install the full product of the same version "over" the trial version. The process is the same as a normal upgrade.

Unattended or automated installation

In addition to the interactive installation process using the *FrontFace Setup Wizard*, the installation package can also be run in an unattended mode. This is useful for software deployment systems or scripted installation of software components. The following command line switches are supported by the *FrontFace* installation package:

Command Line Switch	Description
`/SP-`	Deactivates the *"This will install... Do you wish to continue?"* prompt on start up.
`/SILENT`	Unattended installation process. Disables the setup wizard. In case of errors, dialog messages may still appear.
`/VERYSILENT`	Disables any kind of interactive elements during the installation process like e.g. error dialogs etc. (to be used instead of the **`/SILENT`** option!)
`/LANG=en`	Defines the installation language (**`de`** = German, **`en`** = English, **`fr`** = French).
`/NORESTART`	Prevents Setup from restarting the system following a successful installation, or after a *"Preparing to Install failure"* that requests a restart. Typically used along with **`/SILENT`** or **`/VERYSILENT`**.
`/RESTARTEXITCODE=X`	Specifies a custom exit code "X" that Setup is to return when the system needs to be restarted following a successful installation. (By default, 0 is returned in this case.) Typically used along with **`/NORESTART`**.

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/TYPE=playeronly	Installs only the player application and not the entire setup (which also includes the *FrontFace Assistant*). Supported installation types are: **full**, **playeronly** and **custom**
/TASKS="print2screenDriver, Firewall"	A comma-separated list of installation tasks that shall be performed. (Possible values are: **Firewall**, **print2screenDriver**, **createNetShare** - to NOT execute an installation task, you must prefix it with a "!", e.g. **/TASKS="!print2screenDriver, Firewall"** to not install the Print2Screen driver.)
/LOG="installlog.txt"	Defines a log file into which the setup will log all installation activities for diagnostic purposes.

If you have already installed *FrontFace* and want to perform an automated update to a newer version, the following command line is recommended:

```
frontface.exe /SP- /VERYSILENT
```

Notice: If you update *FrontFace* on a PC with the **/SILENT** or **/VERYSILENT** command line switch on a system that was initially installed using the installation type 24 **"Install Player App only (for installation on a player PC)"**, Setup will automatically terminate any running *FrontFace Player App* at startup. After the installation of the update has been completed, an automatic restart of the player PC will be performed in this case. If this is not desired, add the command line switch **/NORESTART** to the call.

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8.4 LAV Filters (Video)

For the best video playback performance, the installation of the **LAV Filters** (Codec Pack) is recommended. After installation (recommended on all PCs where *FrontFace* is installed), start the **LAV Video Configuration** application from the Windows start menu to configure the LAV Filters for your system.

The most important setting that needs to be configured is the **Hardware Decoder to use**:

Hardware Acceleration

Hardware Acceleration makes the GPU decode the video in order to leave the CPU free for other things. The LAV Video Decoder supports five hardware decoders:

- **None**: The video will be decoded by CPU. Due to the high load, this can result is stuttering video.
- **NVIDIA CUVID**: Nvidia's CUDA based decoder. Video frames are decoded with the same hardware as with DXVA on GPU, but the video frames are required to be copied back to system RAM.
- **Intel QuickSync**: Similar to CUVID, but for Intel's GPUs.
- **DXVA2 (copy-back)**: Can be used by any hardware that supports DXVA2 (Intel can have some issues with VC1 video). Requires more GPU / memory bandwidth since every video texture is copied back to main RAM after decoding.
- **DXVA2 (native)**: Can be used by any hardware that supports DXVA2 (Intel can have some issues with VC1 video). Can have issues due to dropped frames on clip boundaries as DXVA requires video decoder to flush few frames.

DXVA2 (native) versus DXVA2 (copy-back)
DXVA implementations come in two variants: native and copy-back. With the native type, the decoded video stays in GPU memory until it has been displayed. This brings some limitations with regard to playback. Many graphics chips haven't been optimized for copying data from GPU memory back to CPU memory. They are too slow for smooth playback. They can only copy data fast in the other direction. This is the case for old AMD/ATI and old Intel chips.

DXVA implementations of the copy-back type will, copy the decoded video from GPU memory back to CPU memory. Such implementations don't have the limitations mentioned above and act similar to a normal software decoder. DXVA copy-back only works properly if the GPU can copy the data fast enough. Otherwise it will give stuttering video playback. GPUs that should be fast enough are:

- **NVIDIA**: All models of the past few years
- **Intel**: Intel HD Graphics 2000 and newer
- **AMD/ATI**: Radeon HD 6xxx and newer

Notice: Im most cases either **DXVA2 (copy-back)** or **DXVA2 (native)** is the best choice! If you experience any performance issues, try either the one or the other option. In addition to that, you should make sure that the latest graphics card drivers are installed!

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8.5 Proxy Server Configuration

In case you use a proxy server to connect to the Internet, you may have to apply some configuration changes to *FrontFace* in order to make it use the proxy connection when accessing online content such as RSS feeds, weather forecasts or Web pages.

Notice: By default, *FrontFace* uses the proxy server configured for the system (if any). So in most cases, *FrontFace* will work out-of-the-box with a proxy server.

To enable the use of a proxy server, you must edit the following files from the FrontFace installation directory as described below:

"FrontFace Runtime.exe.config" (for *FrontFace Player App*)
"FrontFace Assistant.exe.config" (for *FrontFace Assistant*)
"WebPubUpdater.exe.config" (only when using the "Web Server" publishing method on the player)

The file "FrontFace Player.exe.config" does NOT need to be modified!

Please edit the <system.net> section of the files above and using a text editor like *Notepad* or *Visual Studio Code*.

To entirely disable the use of a proxy server, simply change the enabled="true" property of the <defaultProxy> element to "false".

For a more advanced configuration, use the full-blown <defaultProxy> element:

```
<defaultProxy enabled="true" useDefaultCredentials="false">
  <proxy usesystemdefault="True|False|Unspecified"
         autoDetect="True|False|Unspecified"
         bypassonlocal="True|False|Unspecified"
         proxyaddress="http://192.168.1.10:3128"
         scriptLocation="http://address/proxy.pac" />
  <bypasslist>
    <add address="[a-z]+\.contoso\.com$" />
    <add address="192\.168\.\d{1,3}\.\d{1,3}" />
  </bypasslist>
</defaultProxy>
```

It is possible to set the explicit address of the proxy server as well as a configurations script (PAC) and an optional by-pass list that supports regular expressions.

For detailed information about the settings, please refer to the Proxy Configuration Documentation by *Microsoft*.

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In case your proxy server requires explicit credentials for authentication, please use the *Windows Credential Manager* to add these for the address of your proxy server. To access the *Windows Credential Manager*, open the *Windows Start Menu* and type "**Credential Manager**" or select the "**Credential Manager**" from the (classic) Windows Control Panel.

Go to "**Windows Credentials**" and click on "**Add a Generic Credential**". Then enter the URL/IP of your proxy server and your user name and password. Furthermore, please make sure that you set the `useDefaultCredentials="true"` attribute of the `<defaultProxy>` element in the **`.config`** files mentioned above as well!

⇨ Proxy Configuration of the Integrated Web Browser Engine:

FrontFace includes two Web browser engines you can choose from: **Internet Explorer** and **Chromium**. If you select "**Internet Explorer**", the configuration options described above will also be applied automatically and no further configuration is needed. However, if you use the Chromium browser engine, you have to configure the proxy server separately. In the "**Advanced Player Settings**" from the "**Players**" section of the *FrontFace Assistant*, you can select the proxy type for the Chromium browser engine. These options are available:

- **Default**
  Uses the proxy settings configured for the system (as set in the "**Network**" tab of the IE settings).
- **Auto**
  Uses the WPAD protocol to automatically detect the proxy settings.
- **None**
  The use of a proxy server is disabled.
- Alternatively, you can also enter the URL (**`http://...`**) of a **PAC script** that contains your proxy configuration.

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8.6 Single Sign-On

FrontFace is also able to be used in environments with **Single Sign-On (SSO)**, if they are based on *IWA (Integrated Windows Authentication)*. This applies to displaying web pages in the Chromium-based web browser integrated in FrontFace as well as for all other HTTP requests (e.g. access to RSS feeds through the news ticker or any media objects such as images or PDFs that are integrated via a HTTP URL).

However, the settings for the browser and for all other HTTP requests must be configured separately, as these are technically independent components.

Configuration of the web browser for SSO:

The Chromium browser integrated into *FrontFace* is also capable of displaying web pages that work with **single sign-on (SSO)**. First, make sure that the Windows user under which the *FrontFace Player App* is running can log in to the desired web page via SSO.

Create a playlist with a page where you include your SSO web page as a Web Page media object 94. When you preview, you should typically see the login form, since SSO is not set up at this point. However, if your page is displayed correctly (i.e. you are "logged in"), no further adjustments are necessary in this case.

In *FrontFace Assistant*, go to the **"Players"** section and enable the **"Advanced Player Settings"**. In the **"Web Browser"** section you will find the following two settings, which may need to be adjusted:

Chromium IWA Whitelist:
A comma/semicolon-separated list of URLs that specifies which servers should be whitelisted for Integrated Authentication (IWA). If this list is not specified, the Chromium engine will attempt to determine if a server is on the intranet and will only respond to IWA requests if it is. If a server is detected from the Internet, IWA requests are ignored.

Chromium IWA Delegate Whitelist:
A comma/semicolon-separated list of URLs that specifies which servers Chromium is allowed to delegate to. If this list is not specified, Chromium will not delegate user credentials even if a server is detected from the intranet.

Enter your server(s) here. Save the settings and publish your player. If the settings are correctly, you should now see the actual web page (i.e. in the "logged in" state).

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Single Sign On for Office 365:
In addition to the above settings, there is also a simplified SSO option for Office 365 websites (e.g. SharePoint Online). To use this feature, the SSO option must be enabled for the respective Web Page media object 94 and an Azure AD-based SSO environment must be set up.

Configuration for all other HTTP requests:

In the "**Players**" section of the *FrontFace Assistant*, in the " **Advanced Player Settings**" in the "**General**" section, enable the "**Use Integrated Windows Authentication (IWA) for all HTTP Requests (required for SSO)**" option. Then publish your player again. If the settings are correctly, you should be able to access any HTTP resources that are accessible only when being "logged in".

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8.7 Windows Network Configuration

Using the Windows operating system, computers can easily be added to networks and files can be exchanged and shared via the network.

FrontFace uses the Windows network system to transfer files from admin PCs (using the *FrontFace Assistant*) to player or kiosk computers. This way info screens and info terminals can very easily be updated remotely.

For this purpose, a so-called network share is being used. A network share in this case is a local folder on a PC which is made accessible for other computers via the network. This not only allows the PC to access this local folder by means of the network share, but also to access all other PCs in the same network - given appropriate access permissions.

In order to configure a network share in Windows, both PCs firstly need to be linked with the same network. Whenever Windows recognizes a new network connection (when a network cable is plugged in or the computer connects to a wireless network for the first time) it will prompt you to state if the new network is a home (private) network, a work network or a public network. For public networks (e.g. via a wireless connection in a hotel) particularly strict security regulations apply which usually do not allow file share. It is thus important to select either a "**private network**" or a "**work network**".

In Window's "**Network and Sharing Center**" you will then be able to change advanced settings such as if and how access to file and folder shares on this computer shall be granted. These settings can be customized for each network profile separately, thus please do make sure you make the following settings for the correct profile!

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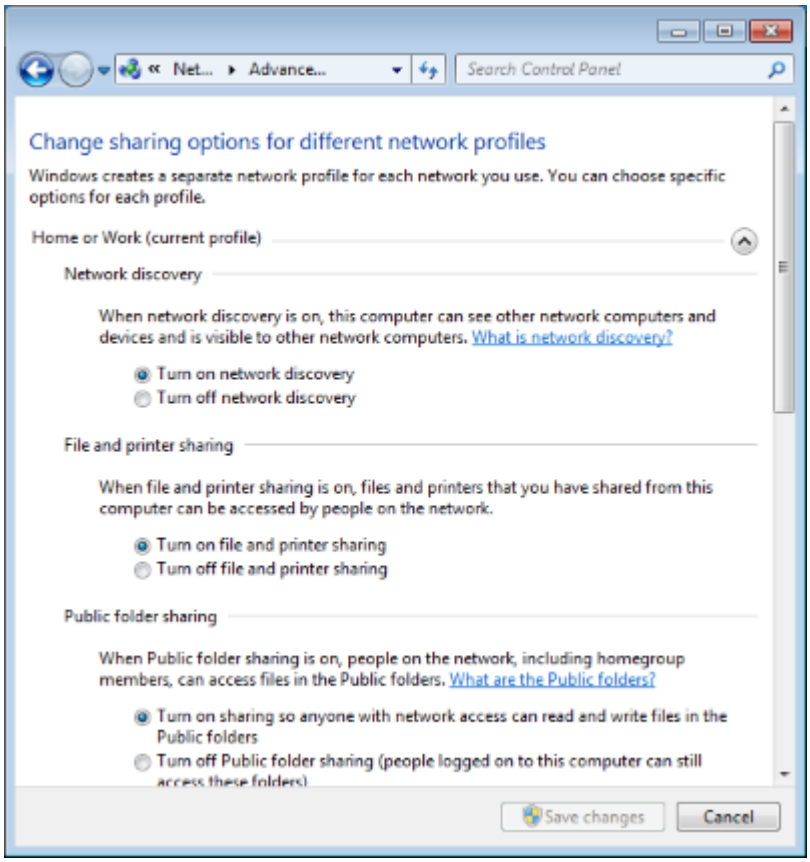

Both the settings "**Network discovery**" as well as "**Turn on file and printer sharing**" need to be selected in order to be able to use network sharing. If you would like to access network shares without entering user name and password, you also need to select "**Disable password protected sharing**" under the setting "**Password Protected Sharing**". Otherwise, remote access to the PC in question is only possible with a user name and password.

Please follow the steps below to share a folder:

- **Set share permissions (create share):**
  1. Right-click on the drive or folder you would like to share, then click "**Properties**"
  2. Select "**Sharing**" tab
  3. Click "**Advanced sharing**"
  4. Activate "**Share this folder**"
  5. Enter the appropriate share name
  6. Click "**Permissions**" at the bottom of the dialog
  7. Enter the desired permission for the group "**Everyone**" (e.g. Full Control) and confirm all dialogs

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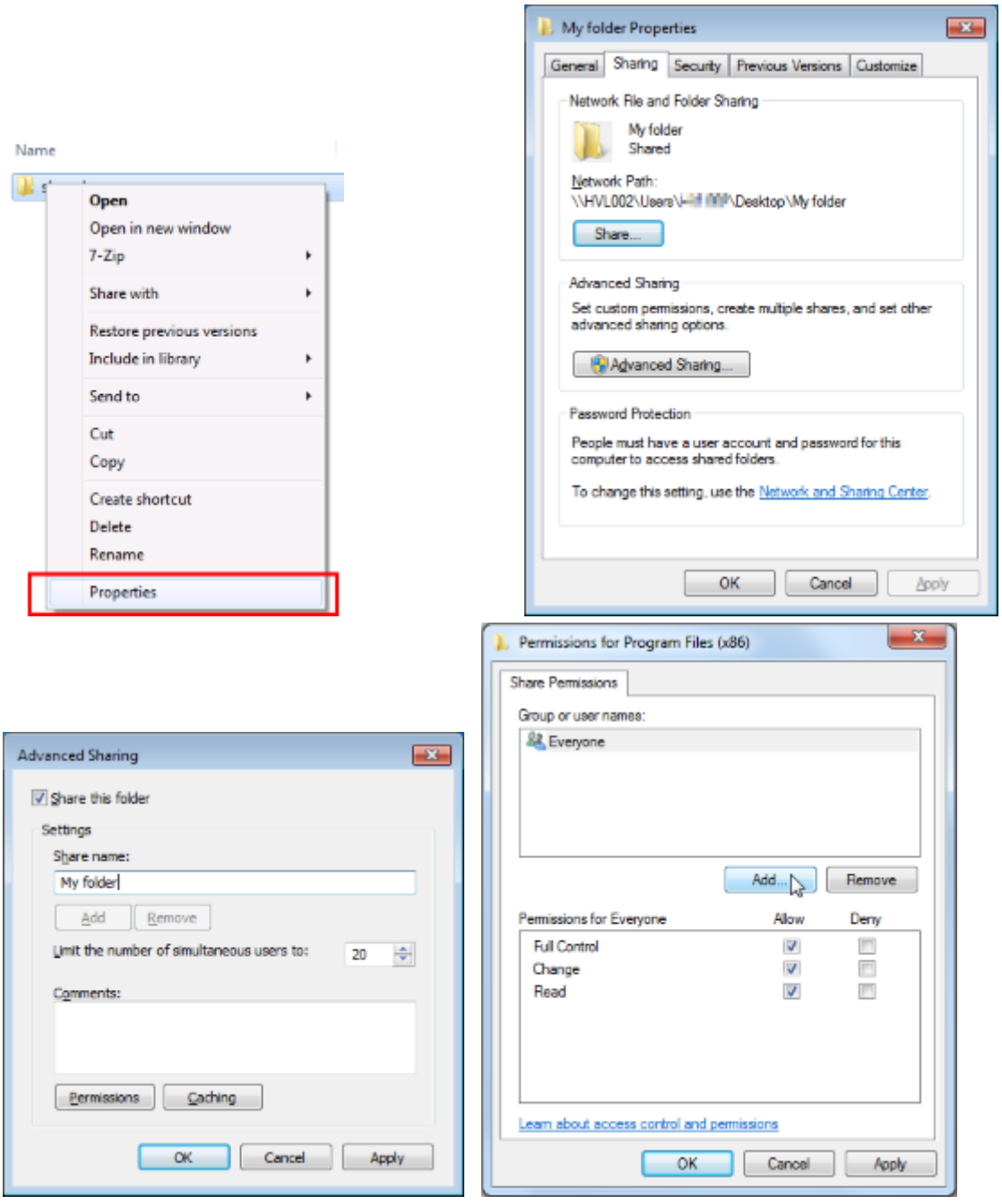

- **Customize file system permissions (grant access permissions)**:
  1. Right-click on the drive or file you would like to share, then click "**Properties**"
  2. Select "**Security**" tab
  3. Click "**Edit**"
  4. Click "**Add**"
  5. Enter "**Everyone**" into the text box and confirm the dialog
  6. Adjust permissions (Full Control) if needed and confirm all

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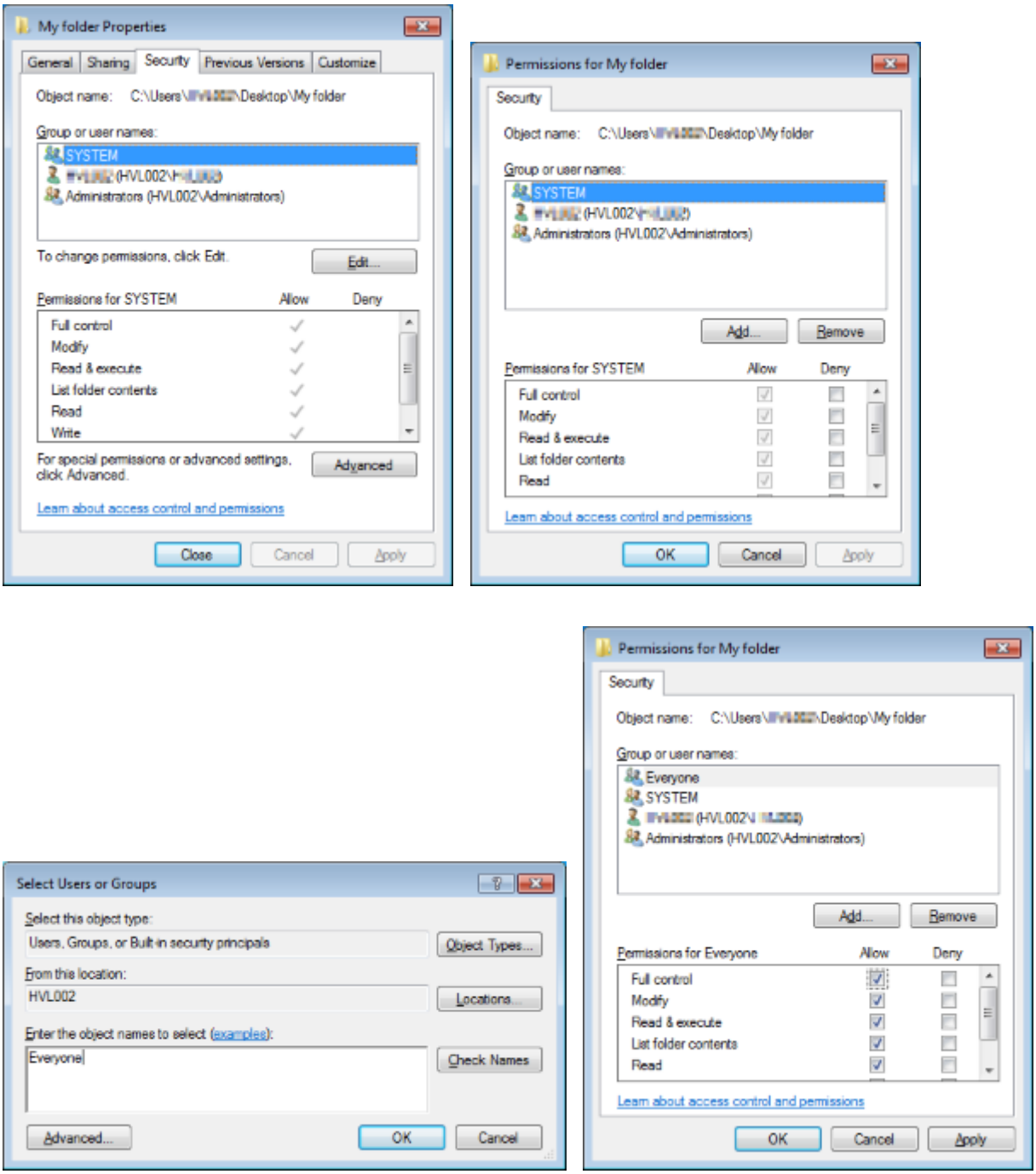

After completing these actions, yo*u* will be able to access the shared folder from another PC in the same network by pressing the key combination **WINDOWS+R** and entering the following path:

```
\\PC NAME\Share name
```

"PC NAME" is the name or IP address of the computer on which you shared the folder. **"Share name"** is the name of the network share which you chose.

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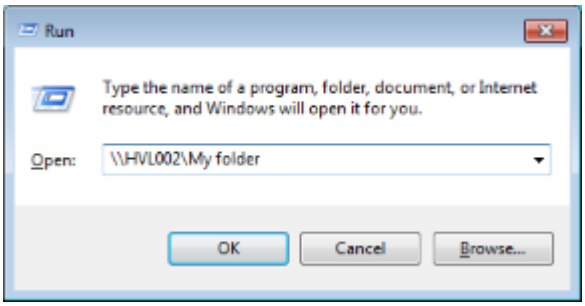

Alternatively, you can also navigate to the shared folder with Windows file explorer by clicking **"Network"** > **"PC NAME"** > **"Share name"**.

⇨ Typical problems and troubleshooting:

If you cannot access the file, please check the following aspects:

1. Can the PC with the shared folder be accessed from another PC by "ping"?
   Click **WINDOWS+R** on another PC and enter `"CMD"`. Type `"ping PC-NAME"` (where PC-NAME is the name of the player PC!) into the console. You can also input the IP address of the shared PC instead of the PC name. If the PC cannot be accessed via this method, a fundamental error has occurred and the following questions should be considered: Are both PCs connected to the same network? Has the network share been activated correctly in the **"Network and Sharing Center"**? Has the network been selected as a **"private"** (home) or **"work network "?**
2. If you can see the shared folder but receive a notification that you do not have the necessary privileges to access it, please double-check whether the file system permissions for the folder were set correctly (see above). Also check whether you are logged on with the correct user name and password unless you have selected **"Disable password protected sharing"**.

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8.8 Windows DPI Settings

In addition to the resolution of the screens, the system settings of Windows allow you to adjust the scaling of screen contents (DPI settings). Starting with Windows 10, these settings can even be applied per screen.

You can find screen scaling settings by right-clicking on the desktop and selecting "**Display Settings**" from the context menu.

Basically, we recommend on player PCs to set the scaling of all screens to **100%** or **96 dpi**. The *FrontFace Player App* is also able to run on systems with different DPI settings. However, it may happen that the presentation differs from the version simulated in the preview, even though you have set the same screen resolution in the preview as on the player.

If you want the *FrontFace Player App* to compensate for any Windows DPI settings and render as if it were set to 100% / 96 dpi, you can set the "**Disable DPI Awareness**" player setting in the list of player settings 61.

To make this setting work in the preview as well, you must select the appropriate player to apply the settings in the preview dialog 125.

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8.9 Shared use of a PC as Workstation and Player

Normally, the *FrontFace Player App* is running on a dedicated device which is called player. This PC is typically only used for running the *Player App*. In some cases it may be desirable to run the *Player App* on a PC that is also used for other purposes. A typical case is a desktop PC at a reception where a flat screen is attached as secondary screen that is used to display general information or welcome messages for visitors. Another case is the "All-in-One" setup 51 where *Player App* and *Assistant* are used on the same PC and two displays are connected to that PC.

The screen on which you want to run the *FrontFace Player App* is referred to as **"Presentation Screen"** in the following.

Information: *FrontFace* also supports the shared use of a player PC that is also used as workstation for running other applications. However, it is recommended to have a dedicated player hardware since this increases the stability and security and is also better in regards to overall system performance.

In order to make the *FrontFace Player App* work in such a setup, there are some configuration options that need to be adjusted. Open the **"Players"** menu section of the *FrontFace Assistant* and enable the **"Advanced Player Settings"** for the player you want to use. Modify the following settings:

- Disable **"Take Screenshots"**
- Disable **"Shutdown Windows Explorer Shell"**
- Disable **"Disable Windows Screensaver"**
- Disable **"Cover Background of Primary Screen with Black"** *
- Disable **"Cover Background of Secondary Screens with Black"** *
- Set **"Start Screen Index"** to the screen index of your presentations screen (e.g. "2")
- Disable **"Hide Mouse Cursor on Inactivity"**
- Disable **"Enable Integrated Onscreen Keyboard (OSK)"**
- Enable **"Ignore Default Keyboard Shortcuts"**

*) Set only one of these options, depending which screen you are using for working with normal applications (usually you should disable "**Cover Background of Primary Screen with Black**").

Once these settings have been applied, select the screen of the player and set the **"Windows Screen Index"** to the screen index of your presentation screen (e.g. "2"). Please configure only ONE screen in the player settings (the presentation screen), since the other screen is supposed to be used for normal work on the PC and should not be acquired by *FrontFace*!

Once you published the project, you can start the *FrontFace Player App* and continue to work with other applications on the non-presentation screen.

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Notice: Since the Player App launches with the standard settings when it is started for the first time and the new, modified settings are applied during the initialization phase, it is possible that e.g. the Windows Explorer Shell still gets close. In this case you should simply restart the PC again. If you then start the *FrontFace Player App* again, all settings will be applied correctly!

Notice: To exit the *FrontFace Player App* with this configuration, you have to start the Windows Task Manager (via **CTRL+ALT+DEL**) and then first exit the process *"FrontFace Player Starter.exe"* and then the process *"FrontFace Player Runtime.exe"*.

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8.10 Keyboard Shortcuts

You can also use keyboard shortcuts to work with the *FrontFace Assistant* and the *FrontFace Player App*. The following list gives you an overview:

Shortcut	Alternative Shortcut	FrontFace Assistant	FrontFace Player App
CTRL+S		Save project	
CTRL+O		Open project	
CTRL+N		New project	
DEL	-	Delete selected list item	
F1		Go to "Home"	
F4		Edit selected menu button	
F5		Start preview (playlist or page)	
F8 ESC			Exit Player App or preview
CTRL+P		Project settings	
F6		Publish	
F7		Enable/disable current list item	
ALT+A	+	Add item to current list	
ENTER		Edit current list item	
ALT+F4		Exit application	Exit Player App
CTRL+PAGE UP		Move element in list one up	
CTRL+PAGE DOWN		Move element in list one down	
CTRL+POS1		Move element in list to top	
CTRL+END		Move element in list to bottom	
→ ⏭			Show next playlist page
ALT+→ ALT+⏭			Show next content page (within a paginated playlist page)
← ⏮			Show previous playlist page
ALT+← ALT+⏮			Show previous content page (within a paginated playlist page)
⏸			Pause/continue playlist

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↓			Close current console/message window

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8.11 Plugin SDK

Besides the **Content and Event Source Plugins** 141 that are available for *FrontFace* on the mirabyte Website, you can also develop your own, custom plugins. This requires programming skills that cover **Microsoft .NET**, **WPF (Windows Presentation Foundation)** and a .NET programming language such as **C#** or **VB.NET**.

The **Plugin SDK** is free and consists of a manual for developers that describes the plugin system and how to develop plugins, some sample plugins with source code and a **Plugin Tester App** that facilitates the development of *FrontFace* plugins with integrated development environments (IDE) such as *Microsoft Visual Studio*.

In order to get the Plugin SDK, please visit the GitHub repository https://github.com/mirabyte/FrontFacePluginSDK .

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IX Security Considerations

9 Security Considerations

As with all computer systems, security considerations should always play an important role when setting up and operating digital signage or kiosk systems.

You should consider the following aspects:

1. **Physical access:** With non-interactive systems, you should try to completely prevent physical access by third parties (e.g. make (USB) ports or the entire player PC inaccessible or hang / mount the screen so that it cannot be reached). You should also keep in mind that most screens react to infrared signals (by the remote control), so consider to block the IR receiver with a piece of tape.
   In the case of interactive systems (kiosks), you have to secure both hardware and software. In addition to setting a PIN 61 to protect exiting *FrontFace*, you should also secure the operating system accordingly (e.g. using the *FrontFace Lockdown Tool* 160).

2. **Operating system:** No matter whether you are using Windows or Android - make sure that available security updates provided by the operating system manufacturers are always installed promptly and in the best case automatically. The advantage of Windows-based player PCs is that you can maintain them in your IT landscape just like normal desktop systems. If there are any deviations from your normal desktop configuration, you can e.g. supply the player PCs with adapted group policies.

3. **Network access:** In most cases, player PCs must be able to access the Internet (e.g. for weather data or the display of websites). A software firewall offers protection here, which only allows the *FrontFace Player App* to access the Internet. In addition, access via network shares is of particular importance with *FrontFace*: Usually, a folder on the player PC is made accessible to the outside as a "publication folder" 50 so that updates can be transferred to the player using the *Assistant*. Here you should ensure that access to this share is only granted to authorized users.

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X Error Codes

10 Error Codes

In most cases, errors or serious warnings will display an error code that can be helpful in determining the cause or mitigating the problem. Here is a list of error codes that FrontFace displays:

Error Code	Description
E-FAS-1000	FrontFace Assistant application settings could not be loaded
E-FAS-1058	FrontFace Assistant application settings could not be saved
E-FAS-1065	Print2Screen Watcher has thrown an error
E-FAS-1066	Failed to create temporary Print2Screen printout copy
E-FAS-1067	Temporary Print2Screen printout does not exist
E-FAS-1068	Closing the Print2Screen preview failed
E-FAS-1069	Closing the Print2Screen Watcher failed
E-FAS-1130	Parked preview process could not be terminated by the FrontFace Assistant. Check in the Windows Task Manager that no more processes with the word "FrontFace" in their name are running and then try again.
E-FAS-1131	Preview process could not be terminated by FrontFace Assistant. Check in the Windows Task Manager that no more processes with the word "FrontFace" in their name are running and then try again.
E-FCM-1021, E-FCM-1028, E-FCM-1102	Error while preparing media objects for publishing
E-FCM-1022, E-FCM-1026, E-FCM-1029	Error while determining file hashes
E-FCM-1023	Publishing folder does not exist. Check the publishing target set for your player in the project under **"Players"** 47. With the publishing methods 50 "Direct to Player" 52 or "File Server" 53, for example, the stored network share may either not be accessible or you do not have (sufficient) access rights. If necessary, you can also store the required credentials in the FrontFace Assistant. You can find this option under **"Players"** below the publishing target: **"Explicit Credentials for the Network Share"**
E-FCM-1024	Error while deleting directories
E-FCM-1025	Error during a file operation: The path is too long
E-FCM-1025	Error while creating directories
E-FCM-1027	Error while copying files
E-FCM-1030, E-FCM-1031	Error while loading layouts. Please check your custom layout for possible errors. Alternatively, use one of the layouts supplied.

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Error Code	Description
E-FCM-1041, E-FCM-1129	The publishing folder set under "Players" 47 must NOT be identical to the project directory (the storage location of your project!). Please select a different storage location for the publishing folder (not inside the project directory or a subfolder of it)!
E-FCM-1046	Error loading a theme file
E-FCM-1047	Error loading a button theme file
E-FCM-1048	Error loading a toolbar button theme file
E-FCM-1059	Error saving a file associated with the project
E-FCM-1054	Bitmap of image file could not be created
E-FCM-1055	Error while starting a process
E-FCM-1056	Error while executing an HTTP web request
E-FCM-1061	Access to publishing folder was denied
E-FCM-1071, E-FCM-1072	Failed to load a playlist page
E-FCM-1073	Error loading a playlist
E-FCM-1074	Internal publishing for preview failed
E-FCM-1075	Failed to load a playlist page
E-FCM-1076	Failed to load a playlist with a specific page
E-FCM-1077, E-FCM-1078	Failed to load layouts
E-FCM-1079, E-FCM-1080, E-FCM-1086, E-FCM-1087	Error loading scheduling timers
E-FCM-1081, E-FCM-1082, E-FCM-1088, E-FCM-1089	Failed to load event sources
E-FCM-1083, E-FCM-1084	Failed to load a playlist
E-FCM-1085	Failed to load a player PC
E-FCM-1090	Failed to delete files when saving the project
E-FCM-1091	Failed to delete directories when saving the project
E-FCM-1095	Failed to load the player file
E-FCM-1096	Failed to save the player file
E-FCM-1099	Chromium engine of the website media object has thrown an error
E-FCM-1103, E-FCM-1104	Chromium engine of the website media object could not be terminated
E-FCM-1105	Error when exiting the Chromium engine and freeing memory
E-FCM-1111	Failed to use the client certificate for authentication on a website
E-FCM-1122	Error creating an audio URI
E-FCM-1123	Playing audio failed
E-FCM-1124, E-FCM-1125	Error terminating the browser engine processes
E-FCM-1126	Internet Explorer engine of the website media object could not be terminated

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Error Code	Description
E-FCM-1127	Error when executing the "ShareToApp" action
E-FCM-1143	Error when checking new content (for web server publishing)
E-FCM-1144	The content monitoring process (Web Server Publishing) was canceled due to an error
E-FCM-1145	Error downloading a file through the content monitoring process (Web Server Publishing)
E-FCM-1146	Error while creating a directory by the content monitoring process (Web Server Publishing)
E-FCM-1147	Error writing a downloaded file by the content monitoring process (Web Server Publishing)
E-FCM-1149	Activation of the feature for creating system restore points failed
E-FCM-1150, E-FCM-1152	Error during FTP upload
E-FCM-1162	Windows user accounts could not be determined
E-FPW-1003	License dongle has been removed
E-FPW-1010	Failed to check for updated content on startup
E-FPW-1012, E-FPW-1013	Unknown error, see error message. Please contact technical support and attach the log file of the player to your request.
E-FPW-1014, E-FPW-1050	Playlist type not supported
E-FPW-1015, E-FPW-1020	Specified playlist was not found
E-FPW-1016, E-FPW-1017, E-FPW-1018	General error when playing a playlist. Please contact technical support and attach the log file of the player to your request.
E-FPW-1044	Website could not be loaded
E-FPW-1045	Failed to update the ticker tape
E-FPW-1052	Remote control service or plugin command has caused an error
E-FWD-1139	Failed to start the content monitoring process (Web Server Publishing)
E-FWD-1140	Publishing folder for web server publishing is missing
E-LDT-1135	FrontFace Lockdown Tool settings (cfgx) could not be loaded
E-LDT-1136	FrontFace Lockdown Tool settings (cfgx) could not be saved
E-LDT-1142	Profile file could not be found
W-FAS-1057	Print2Screen printout is locked
W-FAS-1062, W-FAS-1063, W-FAS-1064	Taskbar item info could not be generated
W-FAS-1128	Print2Screen printout is empty (0 bytes)
W-FCM-1032	General error when playing a HotFolder playlist
W-FCM-1033	Failed to download the weather data provider logo

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Error Code	Description
W-FCM-1034	Failed to use the weather data provider logo
W-FCM-1035	Failed to update weather data due to specified error message
W-FCM-1036	Failed to update the weather data
W-FCM-1037	Weather data could not be evaluated
W-FCM-1038	Weather data version not supported
W-FCM-1039	Weather data could not be read
W-FCM-1040	No weather data available for evaluation
W-FCM-1042	Failed to delete old files during publishing
W-FCM-1043	Deleting old folders during publishing failed
W-FCM-1051	Error loading the old UpdateInfo.xml
W-FCM-1117	Failed to render PDF document on specified page
W-FCM-1118, W-FCM-1121	PDF document page error
W-FCM-1119, W-FCM-1120	PDF document error
W-FCM-1153	Web Server Publishing connection test failed. Check the Internet connection, firewall settings and your stored FTP credentials.
W-FCM-1163, W-FCM-1164	Content handler for printing HTML has thrown an error
W-FPW-1006	License is not valid
W-FPW-1009	Screen was not found, therefore the window is not generated. Check whether the screens defined in the project 58 are actually present and switched on and whether the screen indices have been assigned correctly.
W-FPW-1160	Periodic updating of weather data has failed

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XI Troubleshooting and Support

11 Troubleshooting and Support

If you should experience any problems or issues when using *FrontFace*, please follow these steps to resolve the problem:

1. Please check if the solution to your problem or answer to your questions can be found in this documentation (PDF manual) that comes with the installation package of *FrontFace* or on the corresponding product Website. Plugins also come with a separate user manual!

2. Please visit the Knowledge Base (FAQ) on the *mirabyte Website*. Here you find answers and solutions to the most frequently asked questions! You can also directly search the knowledge base and the user manuals of the *FrontFace* products: https://www.mirabyte.com/go/faq

3. If this does not help at all, please send an e-mail to support@mirabyte.com to submit a support request. Please describe your problem as precise as possible (About which product are you talking? How does the problem manifest itself? Is the problem reproducible? etc.). The more details you give us the faster and more purposeful we can solve your problem!

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