# WATCHOUT 7

## NEW FEATURES AT A GLANCE

# WHY WATCHOUT 7?

After 10 years of version 6, it's time to get to grips with the new features of the successor WATCHOUT 7.

Even though WATCHOUT 7 looks quite similar to the previous version, it is a completely new software.

In many places, the handling of the new version has remained similar, but in other places it is quite different.

This comparative overview is based on versions WATCHOUT 6.7.3 and WATCHOUT 7.6.0.

# DATATON ACADEMY

The Dataton ACADEMY offers certified training courses on WATCHOUT, which have now been adapted to the current WATCHOUT 7.

Many customers who previously worked with WATCHOUT 6 or older versions have updated their licenses in the meantime.

The visual similarity between the two versions allows a relatively easy switch to WATCHOUT 7.

Due to the countless improvements and significant changes in the workflow, it can also be recommended for experienced users to participate in a WATCHOUT 7 Certified User training course.

# GENERAL DIFFERENCES

## WATCHOUT 6

- 32bit software which requires outdated libraries, such as DirectX 9.
- Runs on Microsoft Windows 7 and newer.
- Requires major interventions in the operating system (tweaking) in order to run stably and performantly.

## WATCHOUT 7

- 64bit software that uses the latest libraries of professional graphics cards and CPUs, such as Vulkan 1.3 and AVX 2.
- Runs on Microsoft Windows 10 or newer.
- Using current APIs, less intervention is required to maintain a stable and high-performance system.

# GENERAL DIFFERENCES

## WATCHOUT 6

- Classic software structure with two program parts: WATCHMAKER as production environment and WATCHPOINT as render engine.
- Due to the outdated software architecture, it is difficult to extend or maintain the software. Small changes can cause major damage in the background.

## WATCHOUT 7

- Modern, modular software concept with client-server architecture, in which the functions are divided into communicating nodes.
- The node architecture enables faster and more secure bug fixes and extensions.

# GENERAL DIFFERENCES

## WATCHOUT 6

- At least two computers with two licenses are always required for programming:
- production computer (WATCHMAKER)
- display server(s) (WATCHPOINT)

## WATCHOUT 7

- During programming, you will usually use two computers:
- the production computer with the components PRODUCER, DIRECTOR and ASSET MANAGER
- display server(s) with the render engines (RUNNER)

# GENERAL DIFFERENCES

## WATCHOUT 6

- WATCHMAKER also works without a license dongle, as long as no data has to be transmitted over the network.

## WATCHOUT 7

- PRODUCER, DIRECTOR and ASSET MANAGER can also run on a display server.
- The ASSET MANAGER and RUNNER components require license dongles.
- PRODUCER works without a license dongle as long as only HAP videos, WAV audio and stills are used. Opening the network or using a RUNNER requires a license.

# GENERAL DIFFERENCES

## WATCHOUT 6

- Renders videos on the CPU of the display server. Tweens (effects) are rendered on the GPU.
- Works in sRGB color space with 8bit color depth.
- Can only render to displays with 8bit color depth.

## WATCHOUT 7

- Renders videos and effects on the more effective GPU.
- Works internally in color space REC2020 with up to 16bit color depth and supports various color spaces, including HDR, HLG and PQ.
- Can play on displays with 8, 10 or 12bit color depth.

# SYSTEM ADMINISTRATION

## WATCHOUT 6

- Identification of the graphics outputs only at startup in the splash screen.
- No monitoring of the health of the display servers.
- Management of audio interfaces and capture cards via integrated VNC.

## WATCHOUT 7

- Address and render information can be displayed.
- Remote monitoring of the status of nodes through the Nodes window (hardware load).
- Management of audio interfaces and capture cards via Devices window in the PRODUCER.

# NETWORK

## WATCHOUT 6

- WATCHPOINT and WATCHMAKER use the first network interface that Windows assigns.
- Only one network interface may be active on the production computer.
- DHCP addresses are possible.
- Internal naming of the display servers is recommended.

## WATCHOUT 7

- Nodes can also be detected across network boundaries.
- Multiple network ports are allowed.
- Existing network ports can be displayed.
- DHCP addresses are possible without any problems.

# GRAPHIC OUTPUT

## WATCHOUT 6

- Supports a maximum of 6 outputs of one graphics card (GPU).
- WATCHPAX 62C supports output via SDI.

## WATCHOUT 7

- Supports a maximum of 70,778,880px (8x 4K). All possible outputs of a server are added together. Multiple graphics cards are supported.
- Supports output via SDI when using a deltacast.tv card.
- Supports output via NDI.
- Outputs can be delayed.

# EDID

## WATCHOUT 6

- EDID setting via graphics card drivers; via remote access. (professional workstation graphics cards only)

## WATCHOUT 7

- EDID setting via PRODUCER software. (only professional Nvidea Quadro graphics cards)
- Reading of the EDID data and storage as an EDID asset. (Nvidea Quadro graphics cards only)

# WARPING & MASKING

## WATCHOUT 6

- Manual warping of GPU outputs.
- Warping with a set grid spacing.
- Manual masking of GPU outputs.

## WATCHOUT 7

- Manual warping of all possible displays, including SDI, NDI or virtual displays.
- Optimized warping without a fixed grid.
- Manual masking of all possible displays, including SDI, NDI or virtual displays.

# CAMERA CALIBRATION

## WATCHOUT 6

- Camera calibration using MPCDI 1 data.
- Pattern Generator must be installed on the display server.
- Semi-automatic recalibration.

## WATCHOUT 7

- Camera calibration using MPCDI 2 data.
- No additional software required on the display server. Calibration patterns are streamed to the display server via NDI.
- Automatic recalibration through dynamic MPCDI assets.

# 3D MAPPING

## WATCHOUT 6

- Using 3D objects with UV mesh definitions and the "3D Mapping Projector" display, textures can easily be projected onto 3D objects with precision.
- Virtual displays or media can be assigned as textures.
- Fast manual adjustment through the alingment of just 6 points.

## WATCHOUT 7

- Using 3D objects with UV mesh definitions and the "3D Projector" display, textures can easily be projected onto 3D objects with even higher precision.
- The assignment of textures has been simplified.
- Optimized manual adjustment through the alingment of just 6 points. Faster workflow and higher accuracy.

# STAGE WINDOW

## WATCHOUT 6

- 3D Stage with view from the front, left or top.
- Display positions cannot be protected.
- Video preview is only reasonably smooth using a few (HAP) videos and only very few displays.

## WATCHOUT 7

- 3D Stage with view from the front and full navigation in 3D space in "First Person View" mode.
- Display positions can be locked.
- To ensure a smooth preview in the stage window, mini video versions are rendered in HAP codec.

# AUDIO

## WATCHOUT 6

- Only one audio interface can be used per display server.
- Assignment of audio signals via display name or position.
- Dante can only be used with an additional installation of DVS. Only on self-built servers.

## WATCHOUT 7

- Multiple audio interfaces can be used.
- The new audio bus allows the free routing of signals to one or more audio interfaces, even on different display servers.
- Dante integrated. Must be licensed by the user.

# AUDIO

## WATCHOUT 6

- The audio level can only be adjusted on cue basis.

## WATCHOUT 7

- The audio level can be adjusted on the cue and on the individual outputs. Master volume variable as default.
- Level display of outputs (VU) in the Nodes window.

# CODECS

## WATCHOUT 6

- Video:
  MPEG-1/2, H.264/AVC up to level 5.2, HAP, HAP Q, HAP Alpha, ProRes, QT animation, image sequences (TIFF/TGA), with restrictions: other QT codecs with QT software installed
- Stills:
  JPEG, PNG, TIFF, PSD, BMP, TGA

## WATCHOUT 7

- Video:
  MPEG*, H.264/AVC*, H.265/HEVC, HAP (all variants), ProRes*, NotchLC, image sequences (TIFF/TGA), WATCHOUT RAW codec (internal only).
  *) are optimized by the ASSET MANAGER and are not rendered natively.
- Stills:
  JPEG, PNG, TIFF, PSD, BMP, TGA, WEBP, SVG

# CODECS

## WATCHOUT 6

- Audio:
  AIFF, WAV*, MP3 (with limitations)
  *) preferred codec
- Codec information about imported media is not visible.
- Playback performance and stability are unpredictable.

## WATCHOUT 7

- Audio:
  WAV*, MP3 (with limitations)
  *) preferred codec
- Codec information about imported media is visible in the Properties window.
- Playback performance and stability predictable due to ASSET MANAGER optimization.

# OTHER MEDIA

## WATCHOUT 6

- Rectangles can be generated within WATCHMAKER and can be changed in color or opacity with tweens.
- Transparent texts can be created within WATCHMAKER. WATCHOUT uses the fonts that are installed in the production computer's system and transmits the texts as PNGs to the display servers.

## WATCHOUT 7

- Rectangles and ellipses can be generated in the ASSET MANAGER. Surfaces and edges can be individually colored.
- Transparent texts can be created in the ASSET MANAGER. Required fonts must be imported as an asset and are then transferred internally to the display servers.

# DYNAMIC CONTENT / CAPTURE

## WATCHOUT 6

- Supports capture cards from different manufacturers, also via USB.
- NDI can be used as a video input for dynamic content.
- Audio content is not captured.

## WATCHOUT 7

- Supports capture cards from deltacast.tv, Datapath and partly Magewell as well as various driverless capture cards via USB. Audio content is not captured.
- NDI can be used as a video input including sound.
- SMPTE ST2110 will be usable in the future.

# MEDIA OPTIMIZATION

## WATCHOUT 6

- Optimization of media is only possible externally via transcoders from different providers.

## WATCHOUT 7

- Optimization of media internally via the ASSET MANAGER. Codecs that can‘t be played natively are transcoded into a better and user selectable codec.
- The color space can be changed in the Asset Properties window.
- Parts of a video can be exchanged.

# MEDIA WORKFLOW

## WATCHOUT 6

- Media files are copied to the production computer and linked to WATCHMAKER after import. They must always remain available to WATCHMAKER.
- WATCHMAKER analyzes the media files and then, if used in a timeline, copies them to the display servers.

## WATCHOUT 7

- Media files are imported into the ASSET MANAGER. The original media files are no longer needed afterwards.
- The ASSET MANAGER analyzes the media files, creates the preview for the stage window, optimizes the media (transcoding if necessary), splits them into small file snippets and encrypts them. This leads to better management of graphics card memory.

# MEDIA WORKFLOW

## WATCHOUT 6

- If media files are exchanged under the same name in the Windows directory, they can be automatically updated in the show using the refresh function.
- New media files must always be manually imported into the show.

## WATCHOUT 7

- If media files are defined as dynamic assets and stored in a Windows folder monitored by the ASSET WATCHER, they are automatically updated in the show.
- The ASSET WATCHER monitors definable Windows directories and automatically imports new media assets into the ASSET MANAGER.

# MEDIA WORKFLOW

## WATCHOUT 6

- During production, the content team usually delivers new media assets on removable USB drives or via download links.
- All used media assets get stored in the WATCHOUT project folder and are only assigned to one project at a time.

## WATCHOUT 7

- The content team can gain collaborative access to the ASSET MANAGER via a web interface. Alternatively, Windows folders can be defined and observed by the ASSET WATCHER.
- The ASSET MANAGER works across projects. Different projects can access the same ASSET MANAGER. It can be hosted on a separate computer on the network.

# MEDIA WORKFLOW

## WATCHOUT 6

- Rudimentary search function for cues and media. There is no search function that simply shows which media cues are located in which timelines.
- Media assets can be exchanged globally in the project if the link is relinked in the Media window.

## WATCHOUT 7

- Assets can be searched for in the ASSET MANAGER using various filter functions.
- In the project, cues can be searched for in the Cues window with various filters. Here you can see in which timelines and at which time position a cue sits. Media assets can be exchanged through the Cues window.

# PROGRAMMING WORKFLOW

## WATCHOUT 6

- Imported media assets get placed in the timeline and provided with effects (tweens) if necessary. Only in „online mode“ changes will be immediately visible on the displays.
- In "Standard Mode", changes are transmitted to the display servers using the manual update command.

## WATCHOUT 7

- Media assets are dragged from the Assets window to the timeline and invisibly transferred in the background to the display servers that need the assets.
- WATCHOUT 7 no longer uses an "online/offline mode".

# PROGRAMMING WORKFLOW

## WATCHOUT 6

- If changes are transferred to the display servers, the WATCHPOINT splash screen and a progress bar show up on the screen.
- Invisible changes or transfers are only possible in a very cumbersome and limited way with the help of standby layers.

## WATCHOUT 7

- Since the display servers automatically retrieve the required media from the ASSET MANAGER, this process takes place invisibly in the background.
- If assets are dragged into the timeline that have not yet been fully transferred to the display servers, a placeholder image is displayed, which is then automatically replaced by the new asset.

# TWEENS / EFFECTS

## WATCHOUT 6

- WATCHOUT offers different key-frame effects (tweens) that can be applied to media cues. For this purpose, each applied tween is displayed as a separate tween track under the timeline. Key frames can be precisely edited here.
- Wipe effects with PowerPoint-like fades.

## WATCHOUT 7

- Effects can be applied to cues. To do this, an effect track is created below the timeline in which all the effects used are collected.
- Wipe effects are currently not available.
- New Gaussian Blur effect (requires a lot of performance!).

# TWEENS / EFFECTS

## WATCHOUT 6

- To fade between media cues, an opacity track is applied to the media cue on the upper layer only.

## WATCHOUT 7

- A fade-in or fade-out can be applied to media cues through the Properties window.
- Media cues can be provided with a cross fade effect. This automatically adapts to the time overlap.

# KEYS & FILL

## WATCHOUT 6

- Chroma key for blue screen, green screen, or any color keying (as tween).
- Key & Fill masking between two layers of a timeline through "Masked by Layer Above" function. Works with alpha and luma values.

## WATCHOUT 7

- Chroma key for blue screen, green screen, or any color keying (as a cue property).
- Key & Fill function. Keys can be placed in different layers and even timelines and are combined into a common key. Works with alpha and luma values. Media cues can be defined as fills.

# TIMELINES

## WATCHOUT 6

- Main Timeline and as many auxiliary timelines as you like. The Main Timeline is always active in the background and cannot be switched off.
- Only the Main Timeline can be synchronized to an external timecode.
- Multiple timelines can be observed simultaneously in WATCHMAKER.

## WATCHOUT 7

- Any number of timelines. Each timeline can be switched off or set to autostart at the start of the project.
- Each timeline can be synchronized to an external timecode.
- Multiple timelines can be observed simultaneously. The timeline in focus is clearly marked in color.

# TIMELINES

## WATCHOUT 6

- Timelines can have a maximum length of 23:59:59,999 and contain any number of equivalent layers.
- Layers can be renamed and locked individually.

## WATCHOUT 7

- Timelines can be over 24 hours long and contain any number of equivalent layers. For a better overview, a mini timeline representation is displayed below.
- Cues can be locked separately. Layers can be renamed.
- Timelines can be locked in two ways. To disallow changes to cues or to prevent moving the playhead accidentially.

# TIMELINES

## WATCHOUT 6

- Ongoing shows cannot be changed during playback.
- Timelines can be started by external triggers (DMX, MIDI,...).
- Control Cues can control other timelines.

## WATCHOUT 7

- Timelines can be programmed in Blind Edit mode during playback.
- Timelines can be started, paused or stopped by external triggers (variables) (DMX, MIDI,...).
- Control Cues can control other timelines, including a selection of timelines or "all except selected".

# TIMELINES

## WATCHOUT 6

- Play Control Cues can be used as comment cues.
- Standby layers can be programmed as an emergency layer. If the standby layer is displayed, you can jump invisibly in the timeline. Timeline changes are not possible, as an update is usually visible on the displays.

## WATCHOUT 7

- Marker cues can be used for comments. They also include a count down and count up function.
- Instead of standby layers, there is a Blind Edit mode. In this way, invisible changes to a running timeline are possible.

# TIMELINES

## WATCHOUT 6

- The visibility of cues in a layer can be controlled by a maximum of 30 conditions. These must be activated at the beginning of the show or can be activated or deactivated during playback by an external control.

## WATCHOUT 7

- Instead of controlling individual layers with conditions, cues or groups of cues can be stored in Cue Sets. These can then be changed during playback via a control system.
- Individual cues, including control cues, can be individually controlled by conditional triggers (variables).

# VIDEO LOOPS

## WATCHOUT 6

- Videos or compositions can loop via "Free Running" and "Looping" without changing the playhead position.
- With some restrictions, you can also loop between two control cues, with the timeline running between those cues.

## WATCHOUT 7

- Videos or compositions can loop via "Free Running" and "Looping" without changing the playhead position of the timeline.
- Looping between two control cues, with the timeline running, has been improved.

# CONTROL

## WATCHOUT 6

- Tween values and the start of timelines can be controlled by external triggers.
- MIDI Control or Note Cues can be used as triggers.
- A production computer or display cluster can only be controlled by one MIDI device.

## WATCHOUT 7

- Cue effects and timelines can be controlled by external triggers.
- MIDI Control or Note Cues can be used as triggers.
- Each node can be controlled by multiple MIDI devices.

# CONTROL

## WATCHOUT 6

- DMX/Artnet values can be used as triggers.
- External controllers can change the input values via TCP/IP or UDP.

## WATCHOUT 7

- DMX/Artnet values can be used as triggers.
- OSC float variables can be used as triggers.
- External controllers can change the input values via TCP/IP or UDP.

# CONTROL

## WATCHOUT 6

- External control via simple ASCII strings.
- External control via MSC commands.
- External control via LTC timecode.
  For this purpose, one LTC source can control the main timeline.

## WATCHOUT 7

- External control via simple ASCII strings with the WATCHOUT 6 legacy API.
- External control via HTML REST API.
- External control via OSC commands.
- External control via MSC commands.
- External control via LTC timecode.
  For this purpose, several LTC sources can be used and several timelines can be controlled.

# CONTROL

## WATCHOUT 6

- External devices can be controlled via TCP/IP or UDP strings. If available, also via a COM interface.
- External lighting controls or luminaires can be controlled via DMX/Artnet (also combined channels).

## WATCHOUT 7

- External devices can be controlled via TCP/IP or UDP strings.
- External lighting controls or luminaires can be controlled via DMX/Artnet (also combined channels).
- DMX device descriptions can be loaded as GDFT assets, which makes it much easier to assign function channels.

# CONTROL

## WATCHOUT 6

- DMX can be recorded and used as a cue in a timeline.

## WATCHOUT 7

- DMX can be recorded using the WATCHOUT ArtNet Recorder component and used as a cue in a timeline.

# WATCHOUT®

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