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Product Management

Nuremberg

09.03.2023

Release Letter

Product:	VIDEOJET decoder 7000 <i>VJD-7523</i>
Version:	<i>Firmware 10.40.0055</i>

This letter contains latest information about the above-mentioned product.

1. General

This initial release covers the multi-stream, quad-monitor high-performance H.265 UHD decoder VIDEOJET decoder 7000 (VJD-7523).

VIDEOJET decoder 7000 uses robust, fan-less technology designed for ambitious environmental conditions while providing maximum performance on minimum space in a nicely designed industrial housing.

VIDEOJET decoder 7000 displays video from Standard Definition (SD), High Definition (HD), 4K Ultra High Definition (UHD), and Megapixel (MP) cameras and encoders using H.265, H.264 or MPEG-4 encoding at up to 60 frames per second over IP networks.

VIDEOJET decoder 7000 (VJD-7523) is the successor of VIDEOJET decoder 7000 (VJD-7513). It is using the same housing but comes with an increased number of video output interfaces and provides improved performance and functionality.



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Product Management

Nuremberg

09.03.2023

2. Generic Feature Overview

- VIDEOJET decoder 7000 displays video from Standard Definition (SD), High Definition (HD), 4K Ultra High Definition (UHD), and Megapixel (MP) cameras and encoders using H.264 or MPEG-4 encoding at up to 60 frames per second over IP networks.
- VIDEOJET decoder 7000 provides two HDMI and two DisplayPort (via USB-C connector) outputs, capable of driving up to four HD displays or two 4K UHD displays simultaneously.
- Display settings are automatically discovered and set for optimal display performance.
- Monitor layouts can be switched independently for each display.
- Upright monitors (portrait mode) are supported.
- Video window (cameo) aspect ratio can be set to 16:9, 9:16, 3:4, or 1:1.
- Active camera connections and layout are stored and automatically reconnected after reboot if configured.
- Video smoothing can be configured.
- RTSP connections are supported, enabling connectivity to 3rd party and ONVIF cameras.
- Discovery port is configurable.
- Cameo distance is configurable.
- VIDEOJET decoder 7000 supports IP Matrix application as built-in feature.
- VIDEOJET decoder 7000 can display VCA metadata.
- VIDEOJET decoder 7000 provides bi-directional G.711 audio for the video stream shown in single view on the first monitor.
- Configuration is done using the Configuration Manager.
- The number of decoders presented in capabilities is configurable to regulate the consumption of VMS licenses. Default value is 60.
- System access is password-protected with two levels.
- The system firmware can be upgraded remotely.
- System API is compatible to predecessor VIDEOJET decoder 7000/8000 for easy plug-and-play integration.

For detailed functional description, please refer to the VIDEOJET decoder firmware 10.40 release notes in chapter 6.

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BT-VS/XSW-SEC

Product Management

Nuremberg

09.03.2023

3. System

- VIDEOJET decoder 7000 (VJD-7523) is based on Intel's eleventh generation Core i3 CPU.
- The system has a 64 GB SSD module to store the operating system and application.
- The system runs a Bosch-branded BIOS and a tailored Microsoft Windows 10 IoT Enterprise 2019 LTSC operating system and Monitor Wall software based on UHD-capable Video SDK 6. Making use of Intel's hardware decoding accelerators, the software is fine-tuned for HD, 4K UHD and MP video decoding support.
- VIDEOJET decoder 7000 provides two HDMI and two DisplayPort (via USB-C connector) outputs, capable of driving up to four HD displays or two 4K UHD displays simultaneously.
- The device utilizes a 10/100/1000/2500 Base-T port.
- The system is enclosed in a specially designed housing. It can be directly mounted to the back of a display, or wall-mounted, using the 100 mm (3.937 in) VESA mount option.

Overheating protection

VIDEOJET decoder 7000 provides optimal performance when operated within its standard temperature range, while providing protection against thermal overload.

When ambient temperatures increase, VIDEOJET decoder 7000 reduces the system load dynamically to match the maximum possible performance without overheating.

In case of exceeding the maximum temperature due to environmental conditions, the device will shut down the system to protect it from hardware faults.

- Operating temperature is
 - 0 °C to +50 °C (+32 °F to +122 °F) ambient temperature, with airflow
 - 0 °C to +40 °C (+32 °F to +104 °F) ambient temperature, still air

IP Matrix for PC-free stand-alone applications

The built-in IP Matrix functionality, together with a connected keyboard, allows VIDEOJET decoder 7000 to run as a stand-alone system. An operator can manage up to 32 cameras via the keyboard without any PC or management system required. System setup is quickly done with Configuration Manager. After that, no PC is required to run the IP Matrix.

For larger IP Matrix systems, cluster it with up to 3 other decoders combining their number of cameras up to 128 cameras, keyboards, and displays, all managed by up to 4 operators.

Enhance camera support by licenses to a maximum of 256 cameras in an extended system. A management system can integrate and control an IP Matrix system to keep operators' full awareness of alarm scenarios.

Video output capture service

VIDEOJET decoder 7000 allows to capture the video content of a display, encoded and streamed to a client or recorder. This allows, for example, an audit trail of the operators view and actions. License this service per display.

Activating this feature may have an impact on the overall decoding and display performance.

For detailed technical specification please refer to the datasheet.

From			Nuremberg
BT-VS/XSW-SEC	Product Management		09.03.2023

4. Display output modes

Scaling of video towards a display, especially upscaling to UHD, draws quite some performance. Therefore, UHD displays are driven with a reduced screen refresh rate and share the maximum decoded output frame rate to allow a similar number of streams connected to the decoder, regardless of the connected displays.

The screen refresh rate at 4K UHD displays is limited to 30Hz, and the decoded output frame rate is reduced to 15 frames per second when using 3 or 4 HD displays or dual 4K UHD displays. VIDEOJET decoder 7000 allows to optimize for specific use cases:

- **Essential**
for displaying a higher number of streams, for example as thumbnails on a lower decoded output frame rate
- **Fluent**
for smooth video with a reduced number of streams
- **Best**
for full decoding frame rate with a reduced number of streams and less displays

Mode	A	B	C	D	E
Display resolution	HD (1920 x1080)			UHD (3840 x2160)	
Number of displays	1	2	3 / 4	1	2
Screen refresh rate (Hz)	60	30	15	30	15
Maximum decoded output frame rate					
Default	60	20	15	15	15
Essential	15	15	15	15	15
Fluent	30	30	30 ¹⁾	30 ¹⁾	- ²⁾
Best	60	60 ¹⁾	- ²⁾	- ²⁾	- ²⁾

1) Supported with reduced number of streams only

2) Not supported



From		Nuremberg
BT-VS/XSW-SEC	Product Management	09.03.2023

5. Decoding Performance

VIDEOJET decoder 7000 is capable of decoding streams according to the following tables:

Stream performance H.264

Stream parameters	Bit rate	Display output mode	
		A / B	C / D / E
Resolution @ frame rate	Mbps		
3840x2160@30	32	5	3
2992x1690@30	16	7	4
1920x1080@60	12	10	6
1920x1080@30	8	20	12
1280x720@60	6	20	12
1280x720@30	4	24	20
768@432@30	2	32	24
512x288@30	1	32	24

Stream performance H.265

Stream parameters	Bit rate	Display output mode	
		A / B	C / D / E
Resolution @ frame rate	Mbps		
3840x2160@25	32	7	4
1920x1080@60	12	12	7
1920x1080@30	8	22	14
1280x720@60	6	20	12
1280x720@30	4	24	20



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BT-VS/XSW-SEC

Product Management

Nuremberg

09.03.2023

6. Firmware Features

As the firmware 10.40 development for this decoder is based on predecessor work, please refer to the release notes of VJD-7513 firmware 10.31.0005 for earlier feature enhancements and changes.

New Features with 10.40.0055

- SRTP for encrypted multicast traffic is supported. This allows fully secured communication with and video streaming from CPP13 and CPP14 cameras in multicast environments.
- SNMPv3 trap service has been added, including the support of SNMP-related RCP+ commands for configuration.
- A JPEG snapshot is now possible from each of the displays, including JPEG quality settings parameter.
- Display order can be re-arranged in case Windows display detection differs from mechanical order.
- The default layout is depending on the display number to simplify the identification of display order. The number of video windows per display increases as square of the display number.
- The web interface of the decoder has been updated to the latest style guide and re-structured to ease usage for installation, licensing, and integration purposes.
 - The new web pages provide links to documentation and include a live preview.
 - Maintenance log file creation and download is supported by a workflow mechanism.
 - A keyboard emulator supports initial setup for IP Matrix even without keyboard connected.

Changes with 10.40.0055

- The Video SDK as one of the core components for the decoder firmware has been updated to latest version 6.40, providing a great number of improvements and fixes, mainly around ONVIF and RTSP support, increasing the overall robustness.
- Default number of video windows increased from 30 to 60 total.
- An issue is fixed for banner upload when banners are activated.
- An issue is fixed for zooming out in client dewarping mode of panoramic camera streams.
- An issue is fixed where client dewarping was not working on line 1 of a panoramic camera in onboard dewarping mode. Onboard dewarping is only available for lines 2 and higher, line 1 always provides the full warped image circle.
- An issue with DNS server configuration is fixed.
- An issue is fixed where CPP13 and CPP14 cameras were not correctly connected in camera sequences.
- Maintenance log file download is improved, supported by the new web interface structure.



From

BT-VS/XSW-SEC

Product Management

Nuremberg

09.03.2023

- An issue is fixed where daylight saving time was incorrectly reflected in time zone offset calculation.

7. Restrictions; Known Issues

- Analogue monitors are not supported.
- Connecting encrypted streams without proper signalling may result in crashing the software decoder instance, resulting in black video displayed.
- Alarms will not be signaled with a red border around the cameo if connection was established using CONNECT_PRIMITIVE.
- Using CONNECT_PRIMITIVE via TCP is not possible.
- CONNECT_PRIMITIVE does not support "first available" feature.
- Audio may remain audible despite layout change to other than single view.
- RCP+ command CONF_ALARM_CONNECT_TO_IP is not supported.
- Alarm connection does not support audio.
- Maximum password length is 19 characters.
- ONVIF 2.0 conformance is not yet provided with this firmware release. (Earlier ONVIF specifications do not include decoder support yet.)
- The total number of supported video panels across all attached monitors is configured to 60 by default. The reported list of supported monitor layouts is adapted dynamically according to the number of attached monitors. Consequentially, less layouts are e. g. available for a four-monitor setup in comparison to a dual monitor setup. This effect can be counterbalanced by increasing the number of supported video panels in Configuration Manager ("Advanced > Advanced > Number of decoders").
- With "Reconnect last devices" active camera connections are stored and automatically reconnected after reboot. To avoid deadlock in case of an overload situation the automatic reconnect will be deactivated after the decoder was forced into reboot for ten times within 10 minutes.
- Monitors may be swapped after update. Swap back is possible using Configuration Manager.
- IP Matrix pre-requisites for multi-decoder clustering:
 - Fixed IP addresses must be assigned; DHCP configuration is not functional.
 - Passwords for service level must be same on all clustered decoders.
 - Passwords for user level must be same on all clustered decoders.
- After removing a slave decoder from the IP Matrix master, both decoders must be restarted.
- Camera sequences are paused when picture-in-picture mode is activated.
- Time related settings may appear in Configuration Manager only with delay or after a reboot.



From

BT-VS/XSW-SEC

Product Management

Nuremberg

09.03.2023

- Monitors connected to the Display Port via USB-C may not always be detected during booting. In this case, unplug and reconnect the adapter or cable to the monitor. If only one monitor is used it is recommended to connect to the direct HDMI output.
- Log file download stability may be affected by workload of decoder. As a workaround, the download may need to be repeated, or the workload of the decoder may need to be reduced (disconnect all camera streams).
- Time zone configuration is only supported via TIME_ZONE_STRING.
- The KBD-DIGITAL keyboard is locked automatically during start-up of the decoder, or with reconnect. It will be unlocked after entering the PIN but the lock screen will remain until the next action on the keyboard.
- Certificates used with the decoder must not have any Windows policies defined.

8. System Requirements

For configuration purposes:

- Configuration Manager 7.61

For operation purposes:

- with Bosch Video Management System, refer to BVMS release notes
- stand-alone with integrated IP Matrix functionality