

# VideoJet X10/X20/X40 Rugged Video Encoder

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Invented for life



- ▶ Ruggedized for extended environmental conditions
- ▶ High-quality MPEG-4 video over IP
- ▶ H.264 Baseline Profile encoding
- ▶ Units with one, two, or four video inputs
- ▶ Built-in Intelligence-at-the-Edge

The Bosch VideoJet X encoders belong to a family of industrial, high-performance, single-, dual-, or quad-input CCTV video encoders. They are built into a rugged housing and constructed to withstand extreme environmental conditions. The VideoJet X encoders may be used at extreme temperatures, operating from -30 °C to +60 °C (-22 °F to +140 °F). These powerful and flexible devices represent the cutting edge of high-performance Video-over-IP for CCTV today.

## Functions

### Rugged Environments

VideoJet X encoders are ideal for outdoor applications such as perimeter, border, and fence control, as well as for industrial applications where they are tolerant of harsh environments.

When used at remote locations you benefit from their wide 10 to 30 VDC power input range, so that they can be battery or solar powered. You also benefit from their SFP (small form-factor pluggable) slot that allows a direct connection to a fiber interface module without the need for external fiber hardware.

Their industrial-grade vibration resistance makes these encoders extremely suitable for use in mobile applications such as trains, busses, or other vehicles.

### Flexibility

VideoJet X encoders offer unparalleled recording flexibility. Stream video across the network and store it using Network Video Recorders (NVRs). Record locally on CompactFlash, an external USB hard drive, or use an optional automotive-grade internal hard drive. Network-attached RAID iSCSI storage devices can also be used. The built-in iSCSI support enables the VideoJet X encoders to act as conventional DVRs while streaming high-performance live video across the network.

### Dual Streaming

The VideoJet X encoders use Dual Streaming to generate two independent IP video streams per channel if sufficient computational power is available. This allows viewing and recording at two different quality levels to save disk space and bandwidth. On alarm, they can send an e-mail with JPEG images attached.

### Dual Recording

You can record the streams independently on different media. Thus video can be recorded centrally on iSCSI drives managed by VRM Video Recording Manager and redundantly on the local media. If necessary, for

example in case of a network failure VRM can fill up the gap in the central recording (ANR, Automatic Network Replenishment).

### Recording Profiles

The encoders feature a highly flexible recording scheduler, providing up to ten programmable recording profiles and allowing individually assigned camera profiles. With these profiles, you can accelerate the frame rate as well as increase the resolution on alarm, saving recording space during non-alarm periods.

### H.264 Baseline Profile Encoding

Firmware 4.0 enables the Bosch VideoJet X encoders to use H.264 Baseline Profile to encode the video signal. This allows reducing the required bit rate for a given quality setting, or increasing the quality when keeping the bit rate setting.

### Frame Rates and Resolution

When one or two inputs are used, the encoders deliver MPEG-4 video over IP at a full frame rate of 25 (PAL) or 30 (NTSC) images per second with up to 4CIF resolution on every channel. If four inputs are used the maximum frame rate is 12.5/15 images per second at 4CIF resolution and no Dual Streaming is possible. Because H.264 Baseline Profile does not support field encoding, interlaced video is not possible, thus resolution is limited to a maximum of 2CIF. H.264 encoding requires the double performance in respect to MPEG-4. Frame rate values must therefore be divided by two.

The maximum frame rates listed in the tables below depend on the resolution, picture content and movement, and the number of inputs used.

MPEG-4	4 inputs	2 inputs	1 input
4CIF	12.5/15 ips	25/30 ips	25/30 ips
2/3 D1	25/30 ips	25/30 ips	25/30 ips
2CIF	25/30 ips	25/30 ips	25/30 ips

ips = frame rate in images per second

H.264	4 inputs	2 inputs	1 input
2CIF	12.5/15 ips	25/30 ips	25/30 ips

ips = frame rate in images per second

### Reliability

Designed for reliability, the VideoJet X encoders feature a wide temperature range power supply, dual-redundant Ethernet network ports, a third SFP network slot with switching capability between the network ports, dual USB ports, and fault-tolerant mass storage via iSCSI.

### Access Security

The VideoJet X encoders offer various security levels for accessing the network, the unit, and the data channels. As well as password protection with three levels, they support 802.1x authentication using a

RADIUS server for identification. You can secure Web browser access by HTTPS using a SSL certificate that is stored in the unit. For total data protection, each communication channel—video, audio, or serial I/O—can be independently AES encrypted with 128-bit keys, once the Encryption Site License has been applied.

### Intelligence

With built-in video content analysis, VideoJet X encoders reinforce the Intelligence-at-the-Edge concept where edge devices become increasingly intelligent. The VideoJet X comes with built-in MOTION + video motion detection. This motion detection algorithm is based on pixel change and includes object size filtering capabilities and sophisticated tamper detection capabilities.

Bosch offers more advanced video content analysis (VCA) applications with its Intelligent Video Analysis (IVA). A licensable option, it bases the IVA algorithm on digital imaging technology that uses multi-level image analysis of pixel, texture, and motion (trajectory) changes.

### Viewing

View the VideoJet X encoder video on a PC using a Web browser, in the Bosch Video Management System, or integrate it into another video management system. By routing the IP video to a high-performance VIP XD video decoder or a VIDOS Monitor Wall, you can present the video with ultimate clarity.

### Camera control

Configure and control your camera or dome using one of the various pre-defined control protocols. VideoJet X encoders provide a serial interface and alternatively support Bilinx communication over coax cable.

### Easy Upgrade

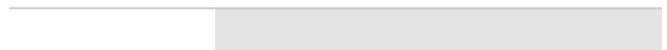
Remotely upgrade the VideoJet X encoders whenever new firmware becomes available. This ensures up-to-date products, thus protecting investment with little effort.

### ONVIF conformance

Firmware 4.10 introduces conformance to the ONVIF (Open Network Video Interface Forum) specification guaranteeing interoperability between network video products regardless of manufacturer. ONVIF conformant devices are able to exchange live video, audio, metadata and control information and ensure that they are automatically discovered and connected to network applications such as video management systems.

## Certifications and approvals

### Approvals



**Safety**

Region	Number
	IEC 60950

**System**

Region	Number
	IEC 62676-2
	EN50132-5-2

**Electromagnetic Compatibility**

Region	Number
EU	EN55103-1 Video and audio equipment
	EN50130-4 Alarm systems
	EN55022 ITE
	EN55024 ITE
	EN50121-4 Railway applications
AUS/NZ	EN61000-3-2
	EN61000-3-3
	AS/NZS 3548 Class B
US	FCC 47 CFR Chapter 1 Part 15

**Environment**

Region	Number
EU	EN60068-2-6 Fc Sinusoidal vibration
	EN60068-2-30 Db Damp heat
	EN60068-2-1 Ab Cold storage
	EN60068-2-2 Bb Hot storage
	EN60068-2-14 Na Change of temperature

Region	Certification	
Europe	CE	VideoJet X10/X20/X40
USA	UL	VideoJet X10/X20/X40, X40 SN
	UL	Bosch UL online certifications directory (link)

**Installation/configuration notes**

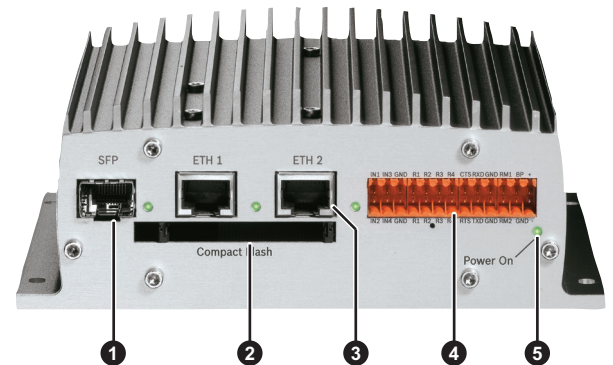
**Front Connectors and Indicators**



VideoJet X40—front

- 1 USB 1 and 2
- 2 Video input 1 (2, 3, and 4 where applicable)
- 3 2-channel audio input (1-channel for X10)
- 4 1-channel audio output
- 5 LED HDD (only operates on HDD versions)
- 6 LED Connect

**Rear Connectors and Indicators**



VideoJet X series—rear

- 1 SFP GBIC slot
- 2 Compact Flash slot
- 3 Ethernet 1 and 2
- 4 Alarm input, relay output, serial interface, and power input on separate connector blocks
- 5 LED Power On

**Parts included**

Quantity	Component
1	VideoJet X10 encoder with 1 video input, or VideoJet X20 encoder with 2 video inputs, or VideoJet X40 encoder with 4 video inputs

1	Quick Installation Guide
1	CD-ROM with software and documentation
1	Drilling template
1	Set of spring clamp contact connectors

An optional extended temperature range power supply can be ordered separately with power cord versions for the EU/US, UK, and AUS regions.

### Technical specifications

Electrical	
Power supply	Via external unit or external battery
Input voltage	10 to 30 VDC
Power consumption	X10: approx. 16 VA, fully equipped X20/X40: approx. 22 VA, fully equipped
Input/output	
Video	X10: 1 x input X20: 2 x input X40: 4 x input
• connector	BNC
• impedance	75 ohm, switchable
• signal	Analog composite, 0.7 to 1.2 Vpp, NTSC or PAL
Audio	X10: 1 x mono line in, 1 x mono line out X20/X40: 2 x mono line in, 1 x mono line out
• connector	2 x 3.5 mm stereo jack
• signal line in	9 kohm typical, 5.5 Vpp max
• signal line out	3.0 Vpp at 10 kohm / 1.7 Vpp at 16 ohm typical
Alarm	4 x input
• connector	Clamp (non-isolated closing contact)
• activation resistance	10 ohm max
Relay	4 x output
• connector	Clamp
• signal	30 Vpp (SELV), 2 A
COM port	Clamp, RS-232/422/485
Video	
Standards	H.264 Baseline Profile (ISO/IEC 14496-10) MPEG-4, M-JPEG, JPEG
Data rates	9.6 kbps to 6 Mbps per channel

Resolution	Horizontal x vertical PAL/NTSC
• 4CIF (MPEG-4 only)	X10/X20: 704 x 576/480 (25/30 ips*)
	X40: 704 x 576/480 (12.5/15 ips*; all inputs used)
• 2CIF	704 x 288/240 (25/30 ips*)
• 2/3 D1	464 x 576/480 (25/30 ips*)
• 1/2 D1	352 x 576/480 (25/30 ips*)
• CIF	352 x 288/240 (25/30 ips*)
• QCIF	176 x 144/120 (25/30 ips*)
	* Depending on encoding algorithm, picture content and movement
GOP structure	I, IP
Overall IP delay	120 ms
Frame rate	1 to 50/60 (PAL/NTSC)
Audio	
Standard	G.711; 300 Hz to 3.4 kHz
Data rate	80 kbps at 8 kHz sampling rate
Network	
Ethernet	Dual port 10/100 Base-T, auto-sensing, half/full duplex, RJ45
SFP	1 x 1 Gbps SFP (small form-factor pluggable) slot for optional standard SFP GBIC module
Protocols	RTP, Telnet, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, RTSP, SMTP, SNMP, SNMP (V1, MIB-II), 802.1x
Encryption	TLS 1.0, SSL, AES (optional)
Control	
Software update	Flash ROM, remote programmable
Configuration	Configuration Manager or Web browser
Camera control	Via serial interface; supported* protocols and devices:
• Bosch	Autodome, HSPT, MIC1-300 IP, TC8x00
• Canon	VCC1, VC-C4R
• CBC	SMD 12P/12PII/20P
• JVC	TK-C676
• Panasonic	WV-CS850
• Pelco	Spectra D/P
• Sensomatic	SpeedDome Ultra
• Sony	EVI D30/31/D100

• Ultrak	KD6
• VT	VPT4x
•	* Basic functions only, no claim for full functionality valid. Bosch may not be made responsible if functions are not implemented or not working under all circumstances.
<b>Connections</b>	
CompactFlash	1 x CF slot for optional standard Type I/II CompactFlash memory card
USB ports	2 x USB 2.0 high-speed ports, 2.5 W max feed each
<b>Mechanical</b>	
Dimensions (H x W x D)	61 x 160 x 178 mm (2.4 x 6.3 x 7.01 in)
Weight	Approx. 1.5 kg (3.3 lb) with HDD
<b>Environmental</b>	
Operating temperature	-30 °C to +60 °C (-22 °F to +140 °F) ambient temperature
Storage temperature	-40 °C to +70 °C (-40 °F to +158 °F) ambient temperature
Relative humidity	0 to 95% atmospheric humidity, non-condensing
Thermal value	X10: 55 BTU/h max, fully equipped X20/X40: 75 BTU/h max, fully equipped
Altitude	X10/X20/X40 with hard disk:
• Operating	-300 m to 5,000 m (-1,000 ft to 16,400 ft)
• Non-operating	-300 m to 12,100 m (-1,000 ft to 40,000 ft)

## Ordering information

### VJT-X10S

VideoJet X10 with 1 video input

Order number **VJT-X10S**

### VJT-X10S-H008

VideoJet X10 with 1 video input and a 80 GB hard disk

Order number **VJT-X10S-H008**

### VJT-X20S

VideoJet X20 with 2 video inputs

Order number **VJT-X20S**

### VJT-X20S-H008

VideoJet X20 with 2 video inputs and a 80 GB hard disk

Order number **VJT-X20S-H008**

### VJT-X40S

VideoJet X40 with 4 video inputs

Order number **VJT-X40S**

### VJT-X40S-H008

VideoJet X40 with 4 video inputs and a 80 GB hard disk

Order number **VJT-X40S-H008**

### Accessories

#### VJT-XACC-PS

VJX10/20/40 wide-range extended-temperature power supply

Order number **VJT-XACC-PS**

#### VJT-XACC-PSUK

VJX10/20/40 wide-range extended-temperature power supply for UK

Order number **VJT-XACC-PSUK**

#### VJT-XACC-PSAU

VJX10/20/40 wide-range extended-temperature power supply for AUS

Order number **VJT-XACC-PSAU**

### DVA-12T-04100RA iSCSI Diskarray 12-bay

4 HDD, 4 TB

Order number **DVA-12T-04100RA**

### DVA-12T-12100RA iSCSI Diskarray 12-bay

12 HDD, 12 TB

Order number **DVA-12T-12100RA**

### DSA-N2B20-06AT

iSCSI disk array, base unit with 6 x 1 TB SATA hard disk

Order number **DSA-N2B20-06AT**

### DSA-N2B20-12AT

iSCSI disk array, base unit with 12 x 1 TB SATA hard disk

Order number **DSA-N2B20-12AT**

### DSA-N2B50-20AT

Base unit with 20 x 1 TB SATA hard disk

Order number **DSA-N2B50-20AT**

### Software Options

#### IVA license single channel encoder

IVA 4.xx/5.xx VCA software license for single channel encoder (e-license)

Order number **MVC-FIVA4-ENC1**

#### MVC-FIVA4-ENC2

IVA 4.xx/5.xx VCA software license for dual channel encoder (e-license)

Order number **MVC-FIVA4-ENC2**

#### IVA license quad channel encoder

IVA 4.xx/5.xx VCA software license for quad channel encoder (e-license)

Order number **MVC-FIVA4-ENC4**

### **BVIP AES 128 Bit Encryption**

One-time installation licence for BVIP AES 128-bit encryption site. Enables encrypted communication between BVIP devices and management stations.

Order number **MVS-FENC-AES**

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