DataSheet SAM-3104 Cathexis 4-channel H.264 Encoders[1]

- **Power Over Ethernet (POE) Class 3 device**

- **Optimized H.264 video compression algorithm to facilitate transmission of High Quality video over low network bandwidth**

- **Built in monitoring function**

- **Supports PAL/NTSC**

- **Provides RS422/RS485 serial port (Will only sync with Video Channel 1)**

- **12V DC, 5.5W, Output (if PoE is active)**

- **Audio input and output. (Input will only sync with Video Channel 1)**

- **Dual streaming – unicast and multicast**

- **Fully integrated within the Cathexis Network Video Recorder, up to 16 encoders (64 cameras) per NVR unit**

- **Hardware watchdog and Built-in-tests**

- **Opto-isolated inputs and relay output**

The Sam3 products integrate analogue cameras into security systems by means of an Ethernet network. In applications where an Ethernet network already exists, this is a significant cost-saver as it does away with the requirement for cabling. With the Power over Ethernet option there is also no need for external power feeds to the encoders.

Conveniently, there is no hardware installation on the NVR (Network Video Recorder) – each SAM-3 encodes an analogue camera feed, converting it to a high quality digital format, which is transmitted as a digital feed to the DVR/NVR.

The encoders integrate seamlessly into the NVR user interface so that each appears as simply another camera on the site.
With "IP-based" cameras, it is possible to implement (VVMS) Virtual Video Matrix Switchers. VVMS is an IP-based video matrix switch that enables the operator to quickly display any site camera on any monitor on a video wall.

The compression ratio and resolution can be scaled independently for each encoder, providing optimum image quality under all conditions. This also enables flexible customisation of encoders to optimise the network bandwidth.

The SAM-3 uses advanced dual streaming technology making it possible to multicast the video feed to multiple users without compromising the network bandwidth.

Note: The SAM units also come in a Rackmount version, which fit into the RCK310x Rackmount chassis. They have a different faceplate attached, to allow a proper fit into the rack. The ordering code for the SAM3104 rackmount version will be **SAM3104-RCK**.

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[1] While Cathexis has made every effort to ensure the accuracy of this document, there is no guarantee of accuracy, neither explicit, nor implied.
Specifications are subject to change without notice.

Ordering information

SAM-3104	4-channel H.264 encoder with I/O, RS422/RS485, audio, PoE

Specifications

Video format	NTSC or PAL
Video Compression	H.264
Video connection	BNC, 1 composite video baseband signal (CVBS)
Channels	4 channel PAL/NTSC 1V PTP input
Audio output	1x 200-300mW Speaker output at RL = 8Ω using 3.5mm Audio Jack
Audio input[2]	1x Microphone input with differential Microphone Amplifier via 3.5 mm Audio Jack Note: Audio can only be synced with the video input on channel 1.
Ethernet	1x 100BaseT RJ45 | single RJ11 connector | Ethernet mac supports 10/100 Mbit/s Ethernet | TCPIPV4 protocol stack embedded in the encoder
Power Over Ethernet	Yes
Power consumption while powered by external source	12V is ~1.8W Max output current limited to 1A. Note: Some devices draw greater than 1A at start-up. The unit may experience problems should such a device be connected.
Power input when not using PoE	12V DC (8 to 36V)
Power consumption while powered by PoE	During operation < 2.2W (no load on external PoE output)
Power output (only usable while encoder is powered by PoE)	Power output is 5.5W (sustained) Fold Back current limiting to 8W with auto retry Output voltage is 12V +-5%

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RS422 serial ports[3]	1x (with DB9 interconnects Tx and Rx, supporting a maximum bit rate of 230kbit/s)
Opto-isolated alarm inputs	1x (debounced with a 200 ms period, reporting edge changes back to the NVR)
Relay outputs	1x (permits a maximum of 1 Amp at 12 volts across the non-polarized NO and NC outputs)
Software	Sam 3104 is supported from software version 5043a1 onwards, on all platforms (recording only for NetBSD 161)
Physical dimensions	Extruded Aluminium housing L,W,H of 132.90mm x 115mm x 30.25mm
Mounting options	Flanges with 2x slotted mounting holes and DIN rail mounting option
Operating temp	0°C to 55°C Ambient (32°F to 131°F)
Enclosure / Environment	IP rating 50. The enclosure is not waterproof. The encoder should only be installed indoors.
Maximum encoders per NVR	Up to 48

[2] Only syncs with Video Channel 1

[3] PTZ control will only sync with Video Channel 1
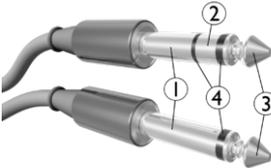
1. **Sleeve:** usually ground
2. **Ring:** Right-hand channel for stereo signals, negative polarity for balanced mono signals, power supply for power-requiring mono signal sources
3. **Tip**: Left-hand channel for stereo signals, positive polarity for balanced mono signals, signal line for unbalanced mono signals
4. **Insulating rings**
	• The Audio Output of the SAM3104 encoders is designed to drive an 8Ω loudspeaker.
	• From serial numbers 000051 – 150 onwards modifications have been done to enable the unit to be connected to an Audio Amplifier as well.
	• On all units:
	    a. when connecting to an Amplifier, connect the cable shield to the Jack-plug sleeve
	    b. when connecting to a loudspeaker, do NOT connect the cable shield to the Jack-plug sleeve

1. Encoder dimensions
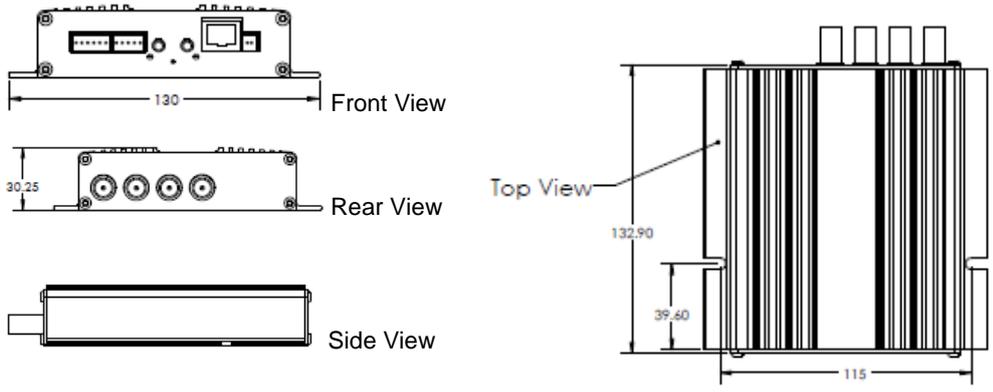
1. Connections
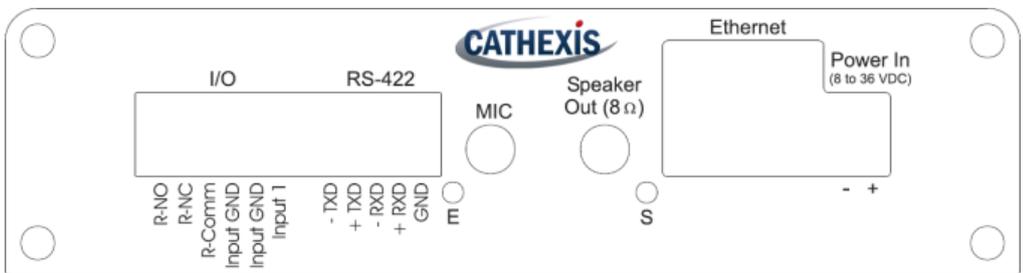
Frame Rate Performance

This table contains the frame rates achieved by the SAM3104 under different video stream loads, and settings.

4 channels Active	Configuration Parameters		Frame Rate Achieved
Configuration 1:	Primary Stream	4CIF; 1.5Mbps; 25fps	20
	Secondary Stream	N/A	N/A
Configuration 2:	Primary Stream	4CIF; 1.5Mbps; 25fps	18
	Secondary Stream	CIF; 200Kbps; 10fps	6
Configuration 3:	Primary Stream	CIF; 1Mbps; 25FPS	25
	Secondary Stream	CIF; 100Kbps; 10fps	10
Configuration 4:	Primary Stream	4CIF; 1.5Mbps; 25fps	19
	Secondary Stream	QCIF; 50Kbps; 10fps	7

3 Channels Active*	Configuration Parameters		Frame Rate Achieved
Configuration 1:	Primary Stream	4CIF; 1.5Mbps; 25fps	25
	Secondary Stream	N/A	N/A
Configuration 2:	Primary Stream	4CIF; 1.5Mbps; 25fps	25
	Secondary Stream	CIF; 200Kbps; 10fps	10
Configuration 3:	Primary Stream	CIF; 1Mbps; 25fps	25
	Secondary Stream	CIF; 100Kbps; 10fps	10
Configuration 4:	Primary Stream	4CIF; 1.5Mbps; 25fps	24
	Secondary Stream	QCIF; 50Kbps; 10fps	10

*<u>Note</u>: The camera must be physically unplugged from the encoder.