USER MANUAL

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2CH ETHERNET VIDEO ENCODER

REVISION C





REVISIONS

Published	Revision	
10.01.2024	Α	Issued for release
10.09.2024	В	Added factory reset
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1 INTRODUCTION

1.1 PURPOSE AND SCOPE

This document outlines and defines the configuration and operation of the PCB 2CH Ethernet Video Encoder. The manual is to be used by trained and competent personnel only.

1.2 ABBREVIATIONS

Abbreviation	Description
РСВ	Printed Circuit Board
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
IP	Internet Protocol
EEPROM	Electric Erasable Programmable Read Only Memory

1.3 SUPPLIER CONTACT INFORMATION

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1.4 DOCUMENT REFERENCES

Document number	Description



2 HEALTH, SAFETY AND ENVIROMENT

2.1 GENERAL

Safety Notes and General Precautions shall be presented to all personnel concerned prior to testing, operation, maintenance, and repair. The operations shall be performed by the responsible engineer/supervisor. The personnel performing this job shall have knowledge of this type of equipment and have familiarized themselves with the applicable procedures and manuals for this product.

2.2 USER HEALTH AND SAFETY

This product is made to operate under many circumstances and specific cases for health and safety will not be described here but must be considered by the equipment manufacturer or owner.

2.3 QUALIFICATIONS AND TRAINING

It is essential that operating personnel have been given training and **education in** how to operate and maintain the software and equipment described in this manual. It is also essential that operating personnel have general operational experience.

The personnel responsible for the operation of this system must be appropriately qualified. The operating company must do the following tasks:

- Define the responsibilities and competency of all personnel handling this system.
- Provide instruction and training.
- Ensure that the contents of the operating instructions have been fully understood by the personnel.

2.4 NON-COMPLIANCE RISKS

Failure to comply with all safety precautions can result in the following conditions:

- Death or serious injury due to electrical and mechanical influences
- Product damage
- Property damage
- Loss of all claims for damages

2.5 UNACCEPTABLE MODES OF OPERATION

The operational reliability of this product is only guaranteed when it is used as designated. The operating limits given in this manual shall not be exceeded under any circumstances.



3 TECHNICAL INFORMATION AND DATA

3.1 TECHNICAL DESCRIPTION

The PCB CS 2CH Video Encoder is used to either encode or decode two composite video inputs to h264 compressed video streams.

Inbuilt network switch and two external 100Mbps ports enable daisy chaining of multiple devices. Configuration is possible through Web interface in each of the two channels.

3.2 TECHNICAL DATA

General				
Manufacturer	Ixys AS			
Ixys part number	101614			
Description	PCB CS 2CH Ethernet Video Encoder			
Weight	~150g			
Dimensions	96 x 104 x 15 mm (PC104 compatible format)			
Supply voltage	24 (9 – 30) V DC			
Power consumption	~5W			
Communication	Ethernet 100 Mbps			
Ethernet port	RJ45			
Power connector	Wago 2091-1124			
Video IO connector	SMB			
Channel 1 Default IP	192.168.24.53			
Channel 2 Default IP	192.168.24.54			
Recommended	18 mm			
spacer between PCBs				
Latency used in pair	~180 ms			
encoding/decoding				
Latency used with	~110 ms			
VJU Studio decoding				



4 DRAWING



Figure 1 – Dimension and pin configuration.



5 CONFIGURATION

Inbuilt web server in each of the two channels are available by browsing to the IP address in a web browser. The following subchapters will describe the configuration pages available.

5.1 LIVE VIEW - STREAM

The live view stream page will show live video from the channel, this is meant for troubleshooting and other video decoding software is recommend for low latency display for real operation.

For the live view to work, the encoding stream must be stopped under the Encoding Control page.

IXXS		
Live View Stream Encoding Control Control Configure Video Format Decoding Configure Audio Configure Admin Clock Network Update	Stream View	
	▶ 0:00	40 C3 E



5.2 ENCODING - CONTROL

The encoding control page is used to select the outgoing stream type and destination.

Note: for multicast streaming, DNS and gateway must be set correct under network configuration.



5.3 ENCODING - CONFIGURATION

The encoding configuration page is used to select the encoding parameters in addition to an on-screen display feature. The bitrate can be adjusted to reduce the bandwidth usage for low bandwidth transmission formats.

1 X X 1	5		
Live View Stream	Stream Configura	ation	Stream Settings
Encoding Control Configure Video Format Decoding	Stream Format:	H 264+AAC MPEG-TS V	Format sets the AV encoding and mux format. H.264+AAC MPEG-TS H.264 (wide, AAC-LC aude, MPEG transport stream. H.264 MPEG-TS H.264 (wide), for aude, MPEG transport stream. H.264 VES H.264 (wide) elementary stream. MPEG+AAC MPEG-TS MPEG4 video, AAC-LC aude, MPEG transport stream.
Control Configure	Resolution:	640x480 V	MPEG4 MPEG-15: MPEG4 video, no audio, MPEG transport stream. MPEG4 VES: MPEG4 video elementary stream. MJPEG VES: Motion JPEG video elementary stream
Configure	Frame Rate:	25 •	Video Settings
Admin Clock Network Update	Bit Rate: GOP Size: Aspect Ratio: Transform: OSD Enable: Messane:	200000 30 None V None V	Resolution sets the frame size, in pixels. Frame Rate sets the frame rate, in frames-per-second. Bit Rate sets the H.264 stream rate, in bits-per-second. GOP Size sets the H.264 stream rate, in Nits-per-second. Aspect Ratio sets the H.264 aspect ratio. None: No aspect ratio information, implies 1: pixel aspect ratio. 4.3 Full-frame aspect ratio for NITSC and PAL. 16:3: Wide-screen aspect ratio.
	X Position: Y Position: Date Display: Seconds Display: Background:	0 0 MM-DD-YYYY V Whole V Black V	JPES Quality sets the JrEc quality setting, ranged 10 to 90. Transform sets the image transformations. None: No transformation. Mirror Vertical: Mirror the video image vertically, Mirror Vertical: Mirror the video image horizontally. Rotate 180: Rotate the video image 180 degrees. OSD Settings
		Save	Enable sets the on-screen-displayed text on/off. Message sets the text to be displayed. Control codes may be used: ^4: insert the current date. ** insert the current frame. ** insert the current frame counter. ** insert the current frame counter. ** insert a newline. X Position sets the left edge of the displayed text, in pixels. Position sets the left edge of the displayed text, in pixels. Date Display sets the display format of the inserted date. Background sets the transparency of the text background.



5.4 ENCODING - VIDEO FORMAT

The encoding video format page is used to configure the composite video parameters for the video input.

	5		
Live View Stream Encoding Control Control Contigure Video Format Configure Audio Configure Audio Configure Admin Clock Network Update	Stream Config - ¹ Video Standard: Field Mode: Brightness: Saturation: Hue: Contrast:	Video NTSC V Interlaced V 128 128 0 128 Restore defaults Sove	Video Settings Video Standard sets the video standard used for all streams. Field Mode controls how top/bottom fields appear in the video. Interlaced preserves both fields in the recording. Interpolated uses a single field and smoothly fills in between lines. Brightness sets the brightness of captured video. Saturation sets the saturation of captured video. Hue sets the hue of captured video. Contrast sets the contrast of captured video. Restore defaults restores the settings for Brightness, Saturation, Hue and Contrast to the default values.

5.5 DECODING - CONTROL

The decoding control page is used to select the incoming stream type and source.

1 X X 3	5			
Live View	Output Stream Con	trol		Settings
Encoding Control	Control			Source address sets the IP address of the stream source, or the multicast address for the multicast group. When address is 0.0.0.0, it will play stream from any source.
Configure Video Format	Status:	Stopped		Port sets the port number of the stream source or multicast group.
Decoding	Actions:	Start Stop		Packet Headers control whether or not to send a 2-byte sequence counter with each packet.
Configure	Settings			Startup sets whether to start the stream when the device is activated.
Audio Configure	URL:			
Admin	Port:	0		
Clock Network	Packet Headers:	None 🗸		
Update	Startup:	Off ✓		
			Save	



5.6 DECODING – CONFIGURE

The decoding configure page is used to set both the decoding parameters and the image standard as well as the onscreen display feature.

	5		
Live View Stream Encoding Control Configure Video Format Decoding Configure Audio Configure Admin Clock Network Update	Output Stream Confi Stream Format: Video Video Standard: OSD Enable: Message: X Position: Y Position: Date Display: Time Seconds Display: Background:	guration MPEG-TS NTSC Off Off Off MM-DD-YYYY Whole Black Save	OSD Enable sets the on-screen-displayed text on/off. Message sets the text to be displayed. Control codes may be used:

5.7 AUDIO – CONFIGURE

The audio configure page is used to set both the audio input and the output parameters.

1 >< < 5	5				
Live View Stream Encoding Control Configure Video Format Decoding Control Configure Audio Configure Admin Clock Network Update	Stream Config - A Audio Input: Input: Volume Left: Volume Right: AGC Left: AGC Right: Output Volume Left: Output Volume Right: AAC Channels: AAC Bit Rate:	Line V 48000 Hz V 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Save	 Audio Settings Input type selects the audio level and connector used for audio input. Line selects the stereo line input connector. Mic selects the mono low-level microphone input connector. Volume Left and Volume Right sets the level of captured audio. Not used when AGC is on. AGC Left and AGC Right sets the automatic gain control for captured audio. Output Volume Left and Output Volume Right sets the level of output audio. AAC Channels sets the AAC encoder to use Mono or Stereo channels AAC Bit Rate sets the AAC encoder target bit rate, in bits-per-second. 	it s.



5.8 ADMIN – CLOCK

The admin clock page is used to adjust the internal clock. There is no internal backup battery, and the clock setting will be lost when power is turned off.

	5			
Live View Stream	Clock Configuratio	n		Date and Time Settings
Encoding				Current Value is the date and time used to set the clock on the device. It must have the format YYYY-MM-DD HH:MM:SS.
Control	Date and Time			Use Host Time, when checked, will automatically update the current
Video Format	Current Value:	1970-01-01 01:14:50		value from the clock on your host computer.
Decoding Control Configure	Use Host Time:	•		
Audio Configure			Save	
Admin Clock Network Update				

5.9 ADMIN – NETWORK

The admin network page is used to set the network configuration.

IXX5							
Live View	Network Manageme	ent		Network Settings			
Stream Encoding Control Configure Video Format Decoding Control Configure Audio Configure Admin Clock Network Update	Network Configuration Network mode: Hostname: MAC Address: Speed, Duplex: Static Configuration Address: Netmask: Gateway: Primary DNS: Secondary DNS:	Static	Save	 Network Mode. This field determines how the device will configure its network interface. When set DHCP, it will configure the network interface automatically using a DHCP server on the local network. When set to static, it will configure using the specified network configuration entered below. Hostname This hostname is used for the DHCP configuration and may allow external access through this name instead of ip address (if the DHCP server configures a DNS entry for this device) MAC address This MAC address allows the device to use a different Media Access Control address for the local network. Static Configuration Settings Address This specifies the IP address of the device. Netmask This specifies the network mask to use for the local network. Gateway This specifies the IP address of the router that provides access to the Wide Area Network or Internet. Primary and Secondary DNS This specifies the IP addresses of the Domain Name Servers to use when looking up hostnames. In some cases, this may be the same address as the Gateway, or it may be provided by your network administrator. 			



5.10 ADMIN – UPDATE

The admin update page is used to read device information, perform factory reset and to update the firmware.

1 X X	5		
Live View Stream Encoding Control Control Configure Video Format Decoding Configure Audio Configure Admin Clock Network Update	Firmware Update Board Information Serial Number: Firmware Timestamp: Firmware Build: Bootloader Version: Software License: System Reboot: Firmware Upload Firmware File: Choose File Reset Parameters Action: Reset Parameter	850539 2021 1008 1726 1410 1.2.0 click here Reboot No file chosen	Board Information Shows the board serial number, currently running firmware timestamp and build, and bootloader version. Firmware Update Firmware File is the firmware image file you have downloaded from Sensoray to your computer. Note: After clicking Submit, do not unplug or reset the board until the firmware update process is complete. Reset Parameters will reset all parameters to the defaults, including network settings. The current network settings will remain intact until the board is powered down, allowing you to change the network settings immediately after doing parameter reset.



5.11 RESET TO FACTORY DEFAULT SETTINGS

Switch #6 can be used to reset all settings to factory default values in case there is no Ethernet access to the unit. Set switch #6 to On, power the board on. Turn the power off after approximately 10 seconds. Set switch #6 back to Off. All settings will be reset to the factory defaults.

After factory reset, go to the "Network" page, and set "Speed, Duplex" to "10Mbit, Full". This is the speed used between the module and the inbuilt Ethernet switch on the mother board. For the external network ports, the speed is fixed to 100Mbps Full Duplex.





6 OPERATION

6.1 VIEW RTP UDP STREAM IN VLC PLAYER

Be aware that VLC does not provide a low latency decoding but is fine for testing purposes.

To view RTP UDP stream in VLC Player with default settings, make a .sdp file with the following content:



Open the file with VLC Player.





A	VLC media player – – – – – – – – – – – – – – – – – – –	×
	Image: Second	
	http://www.example.com/stream.avi rtp://@i1234 mms://mms.examples.com/stream.asx rtsp://server.example.com/stream.asx http://www.yourtube.com/watch?v=gg64x	
	Cancel page Cancel page 1.00x	



7 TROUBLESHOOTING / FAULTFINDING

The list below is meant to provide some hints for troubleshooting but does not guarantee that the issue is covered by the list. Operational feedback will be used to extend the list in future revisions.

Troubleshooting						
Symptom	Possible causes	Remedy				
No communication with web interface	Lack of power	Check that supply power is within limits				
	Incorrect ethernet connection	Check wiring of ethernet connection				
	Wrong network settings	Reset to factory default, see section 5.11				
	Wrong IP address being used	Verify correct IP address being used.				
No video or black picture	Jumpers set to the wrong configuration	Set jumpers to encode or decode depending on the need				
Image is unstable	Half duplex somewhere along the network	Check each section of the network lines to verify full duplex link on all segments				
Delay in video presentation	Software with video buffer used to decode video	Use low latency decoding software. VJU Studio is an example of that.				