

Manuals

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1 Encoder

Encoder is an (interactive) console application for Windows to create, visualize and test Annular Codes. Before you can use the encoder without restrictions, you must copy your license file "AnnularCodeLicense.acl" to the same folder where the executable file "Encoder.exe" is located.

In interactive mode the properties of an Annular Code can be set during code parametrization and stored in a JSON file. The code can be created, visualized, and tested (if a valid decoder license is available). The current settings of the encoder are stored in "settings.json".

In command line mode a JSON file containing code properties can be read and the corresponding code can be created, visualized, and tested (if a valid decoder license is available).

1.1 Main Menu

Key	Menu	Description
f	set output format	One of the following file formats: PNG, EMF, SVG, DXF. Extended Metafile (EMF) and SVG have the best output quality. EMF is only available on Windows. PNG uses EMF for all designs but Normal. DXF uses PNG and is only available for Black-and-White code type.
l	set logging level	Set the logging level to one of the following values: All, Debug, Info, Warning, Error, Fatal, Off
o	create and save annular code	Use the code properties, create an annular code, and write the code in the selected design and output format to an output file.
p	parametrize code	see on next page for further details
s	set code properties and code name	Set the properties and code name (default: ac).
t	test created annular code	Try to decode the created annular code. Since this process needs access to the decoder, a valid license is necessary.
u	show command line parameters	Show the usage of this application in non-interactive command line mode.
v	view annular code	Visualize an annular code after it has been created. Press ESC with focus on the output window to terminate the visualization.
x	exit	Exit interactive mode and save settings.

1.2 Annular Code Parametrization Menu

Key	Menu	Description
a	set data type	One of the following payload data types: - Auto: automatically determined (default) - Binary: binary string starting with prefix 0b or hexadecimal string starting with prefix 0x - digits: 0..9 - numbers: digits and '.', '-', ':', '/', '_, _' - letters: 0..9, '.', '-', ':', '/', '_, _', A..Z, a..z - ASCII: 7 bit ASCII codes - UTF-8: 8 bit codes
b	set background color	The background color (outside the annular code and in the center). Default background color is opaque white.
c	set code type	Black-and-White (default) or Color
d	set data	The payload data.
e	set ECC strength	Set the error correction strength in percent of the data capacity. Supported values are: 7.5% (low), 15% (medium), 25% (quartile), and 30% (high). Default value is medium.
f	set binary output format	Supported options are: binary (default), hexadecimal lowercase, hexadecimal uppercase.
h	help	
i	set number of inner and outer quiet area rings	minimum: 0, default: 1
j	set dpi	Resolution in dot per inch (dpi) -1: use screen resolution
k	set inner diameter in mm	Diameter of the inner background area.
l	set outer diameter in mm	Diameter of the annular code area (including quiet zone).
m	set module size in mm	Module height measured in millimeters. At least two values of the set {k, l, m} must be set.
q	quit	Quit parametrization mode without saving the code properties.
s	set code properties file name	Set the properties file name (default: config.json).
u	show annular code	Create and view the annular code. Press ESC with focus on the output window to terminate the visualization.
w	set line width in mm	Set virtual pen line width (e.g., laser beam width) for drawing the code. Default: 0
x	exit	Write code properties to json file and return.
y	set code design	Choose between one of the predefined code designs. The available designs (except Outline) are depicted on Annular Codes – xeraina in the following order: Normal, Rounded Corners, Round Modules, White Crossing, Black Crossing. Rounded Corners, White Crossing and Black Crossing are not available for line width > 0. Normal is the default design.
z	optimize capacity	There are two different optimizations supported:

		- AR: optimize aspect ratio of module length and module height - Cap: minimize capacity If this flag is true, then the optimization is: first Cap, then AR, otherwise it is first AR, then Cap. Default: false
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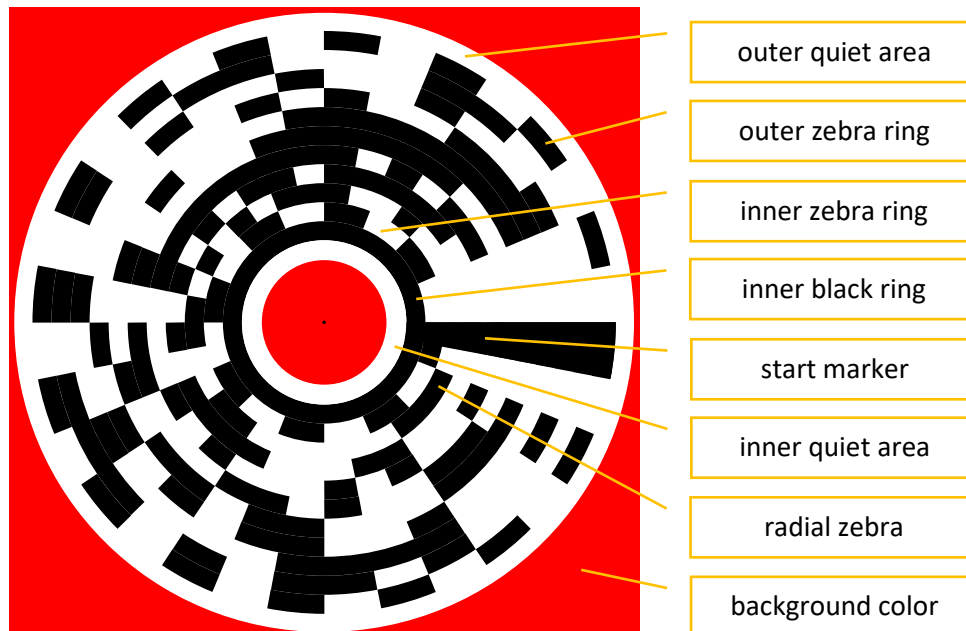


Figure 1: elements of annular codes

2 Decoder (Video Demo)

VideoDemo is an (interactive) console application for decoding annular codes using a camera or an image file. Before you can use the decoder, you must copy your license file

“AnnularCodeLicense.acl” to the same folder where the executable file, e.g. “VideoDemo.exe”, is located.

In interactive mode a camera is used to create a snapshot of an annular code. Before the camera starts, the camera backend, mode, and resolution can be set. The image of an annular code is decoded, and the output is listed. While the camera is taking snapshots the images can be inverted or distorted by noise, ellipses, and perspective transformed. The current settings of the decoder are stored in “decoder_settings.json”.

In command line mode an image file containing an annular code is read and decoded. The output is written on the console. Settings are read from the “decoder_settings.json”.

2.1 Main Menu

Key	Menu	Description
b	set camera backend	Set the camera backend to one of the following values: 0: default, 700: Directshow, 1400: Microsoft Media Foundation, 200: Video for Linux.
c	set code type	Set annular code type: Black-and-White (default) or Color. Can be toggled during camera view.
d	set device number	To open default camera set 0. The device number is used only if the launch string is empty.
h	set frame height	Set the camera frame height. Only listed heights are allowed.
i	help information	Description of menu options.
l	set logging level	Set the logging level to one of the following values: All, Debug, Info, Warning, Error, Fatal, Off
m	set camera mode	Camera specific mode or -1 for camera default mode.
o	set output mode	Set binary data output mode: binary (default) or hexadecimal with lowercase or uppercase letters.
p	set camera launch string	Supported launch strings depend on the available camera backends. Typical examples are: "http://website/stream.mjpg" "rtsp://user:pwd@website:port/stream.sdp" "libcamerasrc camera-name=\"/base/soc/i2c0mux/i2c@1/imx219@10\" ! video/x-raw,width=640,height=480 ! appsink name=appsink"
s	start camera	Start the camera and use the selected camera device, backend, and resolution. Stop the camera by pressing ESC inside of the camera view.
u	show command line parameters	Show the usage of this application in non-interactive command line mode.
v	show full camera launch string	Supported launch strings depend on the available camera backends.
w	set frame width	Set the camera frame width. Only listed widths are allowed.
x	exit	Exit interactive mode and save settings.

2.2 Camera View Menu

Key	Menu	Description
space	reset	Disable all distortions and set black and white code type.
0..9	set level	Set distortion level between 0 and 9 of the preset distortion state.
a	set area state	Set area destruction state. Use keys 0..9 to set destruction level.
b	toggle binarization	Toggle between color or binarized video frame.
c	toggle black-and-white/color	Toggle between black-and-white and color code type.
e	toggle image enhancement	Toggle between normal or enhanced video frame.
i	toggle image inversion	Toggle image inversion.
n	set noise state	Set noise state. Use keys 0..9 to set noise level.
p	set perspective state	Set perspective transform state. Use keys 0..9 to set perspective transform strength.
t	toggle decoding time	Toggle measuring decoding time.
v	toggle camera output	Toggle camera output.
x	stop camera	Stop camera and return to console menu.