

## **Cavitar Welding Camera** Guide for external control via COM-port

This guide describes how to use external control together with Cavitar Welding Camera C200, C300 or C400 series via the COM-port of the computer. It is possible to utilize external control via COM-port for the following operations:

- Start/Stop image acquisition
- Start/Stop recording
- Trigger for two-part ring buffer recording mode

#### IMPORTANT SAFETY NOTICE:

PLEASE READ AND UNDERSTAND THESE INSTRUCTIONS AS WELL AS THE ENTIRE OPERATION MANUAL OF CAVITAR WELDING CAMERA BEFORE MAKING ANY CONNECTIONS IN ORDER TO PREVENT RISK OF INJURY TO THE USER AND TO AVOID DAMAGE TO THE CAMERA.

DO NOT MAKE ANY ELECTRICAL CONNECTIONS TO THE COMPUTER WHEN THE COMPUTER IS ON. ONLY QUALIFIED PERSONS ARE ALLOWED TO MAKE ELECTRICAL CONNECTIONS IN ORDER TO AVOID RISK OF INJURY OR DAMAGE TO EQUIPMENT.

USE OF EXTERNAL CONTROL FEATURES CAN RESULT IN LASER EMISSION FROM THE CAMERA (LASER CLASS 3R). ENSURE THERE IS NO RISK OF UNINTENDED EYE EXPOSURE TO THE LASER OUTPUT AND DO NOT STARE AT THE LASER OUTPUT UNDER ANY CIRCUMSTANCES (SEE CHAPTER 2 OF THE OPERATION MANUAL FOR MORE DETAILS).

Cavitar Welding Camera, C200, C300 and C400 series Guide for external control via COM-port, Revision 1.0.2 © 2022 Cavitar Ltd. All rights reserved. All unauthorized copying strictly prohibited. Cavitar<sup>®</sup> is a registered trademark of Cavitar Ltd.



### 1. Connections

Before external control via COM-port can be applied, appropriate connections need to be made at the COM-port of the computer (RS-232, D9-connector). If the computer doesn't have a COM-port, it is possible to use a USB to COM-port adapter.

Fig. 1 shows the pin chart of the COM-port D9-connector and the pins for each external control feature. The "High" voltage level of external control signals is +3...+15 VDC with an absolute maximum voltage of +25V. Voltages outside the specified range can damage the computer.



Fig. 1. Pin chart of COM-port D9-connector.



#### 2. Cavitar Capture software

After the connections have been made, the details of external control via COM-port can be adjusted in Cavitar Capture software (see Cavitar Welding Camera operation manual for more details).

The actual appearance of the following figures may vary depending on the software version in use and the hardware configuration of the computer. The activation of external control may disable some features and controls in the software.

External control settings can be accessed via selecting "External control..." under "Settings" menu (Fig. 2). This will open the External control settings window (Fig. 3).



Fig. 2. Accessing External control settings.

COM -port		
Disabled	~	
External camera start/	stop signal	
Disabled		l
External recording sign	al	
Disabled		
External trigger signal f	or recording	r
Disabled		Į
		1

Fig. 3. External control settings window.



Cavitar Capture software automatically detects the existing COM-ports of the computer. Select the appropriate COM-port from the list (Fig. 4).

Disphled	
Disabled	
ECOM3	
Disabled	<i>2</i>
Description	24
External recording sig	inal
Disabled	~
External trigger signal	for recording
Disabled	~

Fig. 4. Select appropriate COM-port.

After the appropriate COM-port has been selected, desired operation can be specified for the following features:

- External camera start/stop signal (Fig. 5)
- External recording signal (Fig. 6)
- External trigger signal for recording (Fig. 7)

om pon	
COM3	
xternal camera st	art/stop signa
Disabled	
Disabled	N
Active high Active low Rising edge togg Falling edge togg	jles gles
external trigger sign	nal for recordi

Fig. 5. Alternatives for external image acquisition start/stop.



COM3	~
External c <mark>am</mark> era sta	nt/stop signal
Disabled	~
External recording s	ignal V
Disabled	

External control se	ttings	×
COM -port		
СОМЗ	~	]
External camera start/s	stop signal	
Disabled	~	]
External recording sign	al	
Disabled	~	]
External trigger signal fo	or recording	
Disabled	~	
Disabled		
Rising edge Falling edge	4	Ì

Fig. 6. Alternatives for external recording start/stop.

Fig. 7. Alternatives for external trigger.

External trigger only applies to the two-part ring buffer recording mode (manual trigger button is also available in Cavitar Capture user interface). This recording mode can be useful e.g. for post-process inspection of potential quality issues. Two-part ring buffer recording mode allows the operator to specify a first buffer of desired duration for images before trigger and a second buffer of desired duration for images after trigger. Trigger can be generated e.g. when the operator detects something untypical or when welding parameters go outside typical ranges. For configuring this recording mode, access Recording settings window (see Figs. 8 and 9).



Fig. 8. Accessing Recording settings.

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Recording settings			2
Saved images file format:	tif (8-bit & 16-b	oit, recommended) 🗸 🗸	
Saved images dynamic range:	Full range: 10	- or 12-bit 🗸 🗸	
Save guidelines to images:			
Save timestamps to images:			2
Recorder root folder:	Cha	nge f <mark>old</mark> er	
C:\capture_video_db			T
Create a new sub-folder for each of the folder naming conventions include tag	ch recording pas Include of Include of aming, e.g. 2015 files/s Set f	ss calibration UserID calibration UserID 90522-120022929.tif iolders and options	
Max. frames to capture:		100 🜲	P
Save every Nth frame (1 = save al	l frames):	1	
Capture to RAM buffer	limit, then stop		
Capture continuously to a ring buffer of 30 ≑ see		30 🜲 sec	
Buffer T1 sec continuous	sly, then capture	e T2 sec after trigger	
	ffering time T1	10 🜩 sec	
Bu	inening time 11		
Bu	ffering time T2	10 🔹 sec	
Bu Bu Automatically save in finished and restart F	ffering time T2 nages to disk wi RAM recording	10 🚖 sec	
Bu Bu Automatically save in finished and restart F Do not update display while re	ffering time T2 nages to disk wi RAM recording cording	10 ★ sec	

Fig. 9. Recording settings for two-part ring buffer recording.

In Recording settings window (Fig 9), tick "Capture to RAM buffer" and "Buffer T1 sec continuously, then capture T2 sec after trigger". It is possible to set desired durations for each buffer (10 sec in Fig. 9). Also the "Automatically save images to disk when capture finished and restart RAM recording" feature can be selected, if desirable. For more details, see the Cavitar Welding Camera operation manual.