

User manual for ThermalCapture Fusion Zoom



by



(rev2 January 2018)

Table of Contents

1 Overview and Features.....	3
1.1 Recording of radiometric thermal data and daylight imagery.....	3
1.2 Live-view of aligned thermal and daylight video stream.....	4
1.3 Configurable Interface.....	5
2 Operation.....	6
2.1 Intended Use.....	6
2.2 Scope of Delivery.....	6
2.3 Wiring and Connectors.....	7
2.3.1 Micro-HDMI connector.....	7
2.3.2 2-pin connector.....	7
2.3.3 7-pin connector.....	7
2.3.4 SD card slot.....	8
2.3.5 Mini-USB connector.....	8
2.3.6 TeAx Standard Cable Set for ThermalCapture Fusion Zoom.....	9
3 Configuration.....	10
4 ThermalCapture Fusion Zoom Usage.....	10
4.1 Power On.....	10
4.2 Data Recording.....	10
4.3 Power Off.....	10
5 Post Processing with ThermoViewer Software.....	11
6 Technical Data.....	11
7 Disposal and recycling information.....	12
7.1 European Union — Disposal Information.....	12
8 Contact.....	13

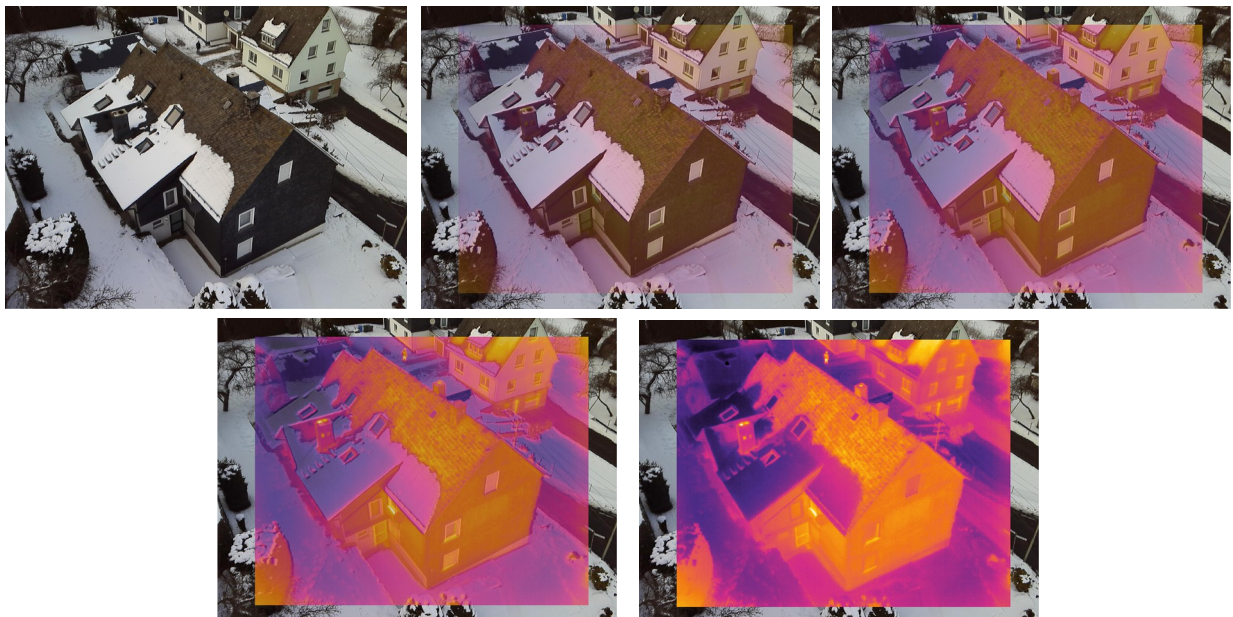
1 Overview and Features

This guide describes the features of TeAx ThermalCapture Fusion Zoom. This device is a dual-camera intended to record infrared and visible light imagery and output analog and digital live video. It also includes a 10x optical zoom for daylight images and is especially suited for tasks, which require a small form factor and little weight.

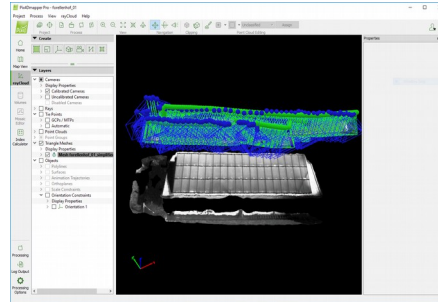
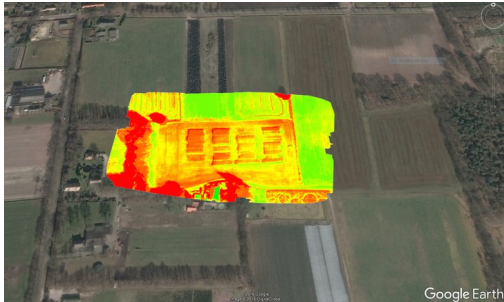
1.1 Recording of radiometric thermal data and daylight imagery.

ThermalCapture Fusion Zoom records synchronous thermal data and daylight imagery. The recorded images and video streams can be further post-processed with the included [ThermoViewer](#) software. [ThermoViewer](#) is the post-processing software provided by TeAx Technology to process RAW data captured with ThermalCapture Devices. It allows the user to quickly browse through recorded data and tune every single frame into the perfect result. For further usage of the data it can be exported into images like JPG, PNG and TIFF, videos and CSV data. CSV is especially useful, if further automatic data processing follows. There is also the option to export data into radiometric JPGs. Those files can be opened with powerful FLIR Tools for deeper analysis, or automatic report generation. ThermoViewer includes, but is not limited to:

- File handling: Open and browse files, playback, zooming and dragging, temperature reading, split and merge
- Blending of thermal and daylight imagery



- Adjust RAW conversion parameters: range adjustments, color adjustments, image rotation, temperatures
- Export function into various data formats. Out-of-the-box compatibility to Icaros One Button, Pix4D, Agisoft Photoscan and Google Earth



- NMEA and Mavlink Parser for recorded serial data during operation.
- Non-Uniformity Correction (NUC)
- FFC temperature correction

For further information see [ThermoViewer user manual](#).

1.2 Live-view of aligned thermal and daylight video stream

ThermalCapture Fusion Zoom offers analog (in PAL-D) and digital (via HDMI) video output of blended thermal and daylight video.



Zoom fully open



Fully zoomed in (10x)

1.3 Configurable Interface

ThermalCapture Fusion Zoom includes a serial interface for meta data (e.g. GPS, GLONASS) and a configurable SBUS, PPM and PWM interface.

The various interface options of the ThermalCapture Fusion Zoom are configurable with the [ThermalCapture Fusion Zoom Configurator](#), see also the [Configurator user manual](#).

2 Operation

Before you can use ThermalCapture Fusion Zoom the first time, take some time to learn more about the product and needed steps to a setup tailored to your needs.

2.1 *Intended Use*

- It is under the responsibility of the user to ensure, that during use as a surveillance camera no personal rights of third parties are violated.
- The camera is designed for use in private and commercial areas.

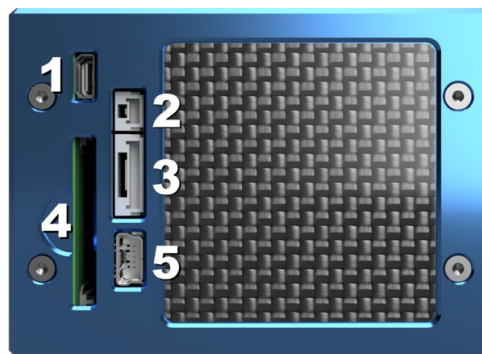
2.2 *Scope of Delivery*

- ThermalCapture Fusion Zoom
- Power- / Splitter-Cable
- SDHC Memory card (32GB)
- User Guide (pdf)
- Configuration software (for Microsoft Windows) and Configuration Guide (pdf)

2.3 Wiring and Connectors

ThermalCapture Fusion Zoom has the following connectors:

1	Micro-HDMI connector
2	2-pin connector for analog video
3	7-pin connector
4	SD card slot
5	Mini-USB for configuration



2.3.1 Micro-HDMI connector

ThermalCapture fusion provides live video via this HDMI connector in 1080p/30Hz.

2.3.2 2-pin connector

VIDEO_OUT provides PAL composite video out from the TAU core. The video standard and other video related settings can be configured.

2.3.3 7-pin connector

The 7-pin connector has the following pin definition:

1	5V output for GPS
2	EXP1
3	EXP0
4	VIN (12-36V DC)
5	GND
6	TRIGGER_IN
7	GPS_IN

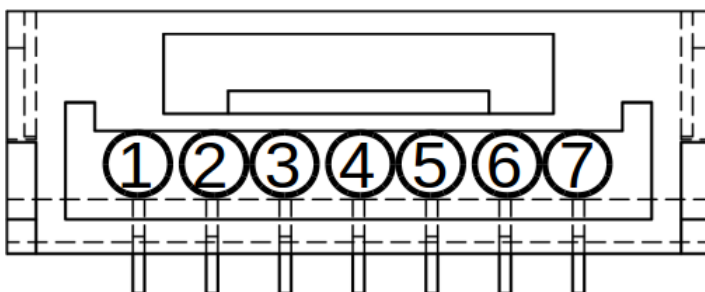


Image capture is triggered when the TRIGGER_IN pin is pulled to ground. It is connected to 3.3V internally via resistor. You can apply a switch or a transistor between TRIGGER_IN and GND. It is also possible to connect a digital signal (0-5V) to the trigger input.

Images are captured as long as TRIGGER_IN is at ground level. It is not possible to connect the trigger input permanently to GND, because in this case there would be no way to switch ThermalCapture Fusion Zoom off or release the SD card, without potentially damaging its file-system.

TRIGGER_IN can also be configured to be compatible with PWM, PPM, or S-BUS signals.

GPS_IN is a UART interface. It supports inverted and non inverted signals (0-5V). The data received at this pin is continuously stored in an internal buffer. This buffer is added to any stored image. So it is possible to connect a GPS receiver or an IMU to ThermalCapture Fusion Zoom. Since the data is only stored but not processed at ThermalCapture Fusion Zoom, any UART based protocol can be used as long the sensor begins with data output on its own. Interface settings (baud rate etc.) can be done with the serial configuration tool (see chapter *Error: Reference source not found*).

ThermalCapture Fusion Zoom is intended to be used with small UAVs. You need an adapter cable from your power supply to 7-pin connector. ThermalCapture Fusion Zoom can work with a DC voltage from 12 to 36V. The source must be able to deliver 7W continuous and peaks up to 14W. A standard cable for connection is included (see 2.3.6).

2.3.4 SD card slot

This is a slot for a SD card. ThermalCapture Fusion Zoom stores data on the SD card connected to this interface. The SD card must be formatted with FAT32 file system and support a minimum serial data writing speed of 10MB/s. We recommend a SDHC Class 10 with 32GB capacity for use with ThermalCapture Fusion Zoom.

It is strongly recommended to use the [SD Formatter 4.0 for SD/SDHC/SDXC](#) instead of formatting utilities provided with operating systems. Using generic formatting utilities may result in less than optimal performance for your memory cards.

2.3.5 Mini-USB connector

ThermalCapture Fusion Zoom features a Mini-USB interface for configuration. This interface also allows configuration of the TAU core via the FLIR TAU GUI.

To do TAU core configuration disconnect any memory devices, connect the device to your PC and execute steps described in chapter *Error: Reference source not found* within this guide.

2.3.6 TeAx Standard Cable Set for ThermalCapture Fusion Zoom

With each ThermalCapture Fusion Zoom unit comes a standard cable that splits the 7-pin connector functions into easy-to-use connectors.

3 Configuration

ThermalCapture is configured using ThermalCapture configuration tool, which is available here: <http://thermalcapture.com/thermalcapture-configurator>

4 ThermalCapture Fusion Zoom Usage

ThermalCapture Fusion Zoom was designed to be used with UAVs. Its task is to store thermal image data from the TAU core, when the trigger signal occurs. So there is only limited human intervention necessary to operate ThermalCapture Fusion Zoom. In the following the complete process from power up through data recording to power down is described.

4.1 Power On

You can power on with or without a connected sd card. ThermalCapture Fusion Zoom begins to boot immediately when 12-36VDC is supplied to the to the 7-pin connector. During boot up the LED on the back side glows red. This will take about two seconds. After boot up ThermalCapture Fusion Zoom waits for the sd card and the LED glows green. When the sd card was found and ThermalCapture Fusion Zoom is ready to work, this LED will start blinking green.

4.2 Data Recording

When the trigger input is pulled to ground images from the TAU core are captured and stored to the sd card. The LED on the back side will flicker red and the letters "REC" are shown in the video output. Do not power off ThermalCapture Fusion Zoom or release the sd card when the red LED is flickering. The file-system of the sd card may get damaged. If an error occurred while writing the data to the sd card the LED will blink green and red alternately. This will also happen if the sd card is full.

4.3 Power Off

Every time the LED does not flicker red, it is safe to remove the sd card or to power off ThermalCapture Fusion Zoom. Power off can only be done by turning off the power supply which is connected to the 7-pin connector.

5 Post Processing with ThermoViewer Software

ThermoViewer is the post-processing software provided by TeAx Technology to process RAW data captured with ThermalCapture Fusion Zoom. It allows the user to quickly browse through recorded data and tune every single frame into the perfect result. For further usage of the data it can be exported into images like JPG and PNG, videos and CSV data. CSV is especially useful, if further automatic data processing follows. There is also the option to export data into radiometric JPGs. Those files can be opened with powerful FLIR tools for deeper analysis, or automatic report generation. Please take a look at the ThermalViewer user manual for further information.

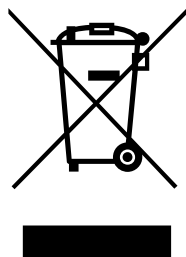
6 Technical Data

Analog TV-formats	PAL-D
Digital TV-formats	Full-HD via HDMI (1080p, 30Hz)
Input voltage	12-36 V DC
power consumption	7W continuous, 14W peaks
Storage temperature	-4°F to 131°F -20°C to 55°C
Operating temperature	23°F to 113°F -5°C to 45°C
weight	310g

7 Disposal and recycling information

You must dispose of this device properly according to local laws and regulations. Because this device contains electronic components, the device must be disposed of separately from household waste. When this device reaches its end of life, contact local authorities to learn about disposal and recycling options.

7.1 European Union — Disposal Information



The symbol above means that according to local laws and regulations your product and/or its battery shall be disposed of separately from household waste. When this product reaches its end of life, take it to a collection point designated by local authorities. The separate collection and recycling of your product and/or its battery at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

8 Contact

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Internet: <http://www.thermal-capture.com/>

E-mail: support@teax-tec.de

WEEE: DE47944405

Please provide the following information about the device when you make an inquiry:

- Name and manufacturer of your system
- Item and serial no. of the product

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