correlated
SOLUTIONS

VIC-DAQ

(Models #ATB-V AI & #ATB-V AI FT)

User Manual

Version 1
2025


correlated
SOLUTIONS
OUT A
OUT B
EVIN
TRIG IN
ATB - V
USB


correlated
SOLUTIONS
AIN 1
AIN 3
AIN 5
ANALOG INPUT
MAX. ± 10 V

VIC-DAQ User Manual

1. SAFETY & OPERATION INSTRUCTIONS.....4
- 1.1 Intended Use
- 1.2 General Safety Instructions

2. VIC-DAQ.....6
- 2.1 Technical Description
- 2.2 Standard Triggering
- 2.3 VIC-DAQ with Analog Input Module
- 2.4 VIC-DAQ FT with Flex-Trigger Module

3. STANDARD SETUP SCHEMES.....9
- 3.1 Synchronization of stereo camera system & stroboscopic illumination
- 3.2 Setup for Fatigue & Vibration Module
- 3.3 Setup for High-Speed stereo system and stroboscopic illumination
- 3.4 Setup for Start Trigger for single events

4. QUICK START: Using VIC-DAQ with the VIC-Snap Software.....13
- 4.1 Installation: Computer Connection and Drivers
- 4.2 Camera Trigger
- 4.3 Stroboscopic Illumination
- 4.4 Analog Inputs
- 4.5 Start Trigger / Event Trigger Input
- 4.6 Operation: Timer Control with Internal Trigger Mode
- 4.7 Operation: Timer Control with External Trigger Mode
- 4.8 Timer Configuration

5. TECHNICAL SPECIFICATIONS.....16

4. CONFORMANCE, MALFUNCTION, & WARRANTY.....18

If you have any questions about using your VIC-DAQ, please contact our Support Team.

support@correlatedsolutions.com
1.803.926.7272

1. Safety & Operation Instructions

- Read the operating instructions carefully before using the system and pay particular attention to the safety instructions.
- Keep these documents along with the technical brochures and accessories for future reference.
- These operating instructions should be considered an integral part of the device. If the device is transferred or sold, ensure that the operating instructions are also passed on.
- Any modifications, additions, or conversions to the device must not be made without prior approval from Correlated Solutions.
- Definition: The parts from Correlated Solutions, such as electronics and actuators are called “units” or “devices”
- Note: The pictures of the components may differ from the delivered product.

1.1 Intended Use

Any use of the product other than that described in the “Intended Use” section does not qualify as the intended use. The ATB-V is used exclusively for data acquisition purposes, triggering, and synchronization. The scope of delivery includes the ATB-V, 3m-USB cable, and the mounting for the stereo beam. The information in the operating instructions, in particular the safety instructions and permitted operating ranges, must be observed and obeyed at every phase of the product’s life. Any additional use is considered unintended use and is misuse of the device.

The device may only be used by qualified and trained personnel after reading the user manual and safety instructions!

Only use original parts from Correlated Solutions. Correlated Solutions does not give any warranty for damages or malfunction caused by additional parts not supplied by Correlated Solutions. This can change the specified properties of the units and cause a malfunction. Refer all services to the qualified Support Team at Correlated Solutions.

Other important considerations:

- Only work with the devices in a clean and dry environment!
- Do not place heavy objects on any cables (e.g. power cords, sensor cables, actuator cables, optical cables).

1.2 General Safety Instructions

There is a danger of damage to the product as a result of exposure to water, moisture, and dust. If water or moisture gets into the device, internal short circuits can occur, which will destroy the device. These can lead to fire or malfunction of the device. Please follow the recommendations listed below:

- Protect the system from water, moisture, and dust at all times (during use and storage).
- Use the system only indoors.
- Protect the system (from shock and water) for any transport. Also keep below these ambient temperatures for **storage and transport**: 32°F (0°C) to + 158°F (70°C), 10% to 95% humidity (non-condensing).
- Observe the ambient temperature limits for **operation**: 32°F (0°C) to + 113°F (45°C), 10% to 95% humidity (non-condensing).
- Please note the required environmental conditions for the components from the technical specifications in Section 3.1.
- Only work with the unit in a clean and dry environment! Only specially prepared units can work under other conditions!

Disconnect your device from the USB-port immediately and contact Correlated Solutions for service under the following conditions:

- If any liquid, fluid or water has been spilled or objects have fallen into the unit.
- If the unit has been exposed to rain or water.
- If the unit does not work as described in the manual.

All maintenance or repair work, in particular the opening of the device and any adjustments, are to be done only by qualified specialists from Correlated Solutions.

In case of malfunctioning or damaged system components, please contact Correlated Solutions directly.

Correlated Solutions
121 Dutchman Blvd.
Irmo, SC 29063
correlatedsolutions.com
support@correlatedsolutions.com

2. VIC-DAQ

The VIC-DAQ is a trigger, synchronization, and data acquisition unit (DAQ) developed for Digital Image Correlation (DIC). The VIC-DAQ is specially designed for operation with the VIC-Snap 10 software and functions as an integral part of the turnkey DIC systems from Correlated Solutions.

The VIC-DAQ is used for synchronous image acquisition of stereo camera systems using the hardware trigger mode. The VIC-DAQ enables triggering of stroboscopic illumination and synchronization with external digital and analog signals, and can also be used for synchronous analog data acquisition.

2.1 Technical Description

The VIC-DAQ is available in two versions: **VIC-DAQ and VIC-DAQ FT**.

VIC-DAQ
with Analog Input Module

Model #ATB-V AI

The VIC-DAQ includes an extension of 6 analog inputs for analog data acquisition synchronized with DIC image acquisition for cameras in hardware trigger mode at **OUT A**.

VIC-DAQ FT
with Flex-Trigger Module

Model #ATB-V AI FT

The ATB-V AI-FT includes an extension with an additional trigger input that can be used for synchronization with an external analog signal with a voltage range of ± 10V.

Further specifications can be found in the Technical Data Section.

If you have any questions about using your VIC-DAQ, please contact our Support Team.

support@correlatedsolutions.com
1.803.926.7272

2.2 Standard Triggering

The VIC-DAQ is equipped with the trigger functionality for stereo camera systems and stroboscopic illumination and synchronization with external digital signals.

Trigger Inputs (TRIG IN):

- **EVIN**: Event trigger input for starting image recording for single events. Input voltage range of 0V to 5V TTL is supported.
- **FSYNC:** The frequency synchronization trigger input can be used for synchronous image acquisition with an external trigger signal up to 100,000 Hz. Input signals with the voltage level of 0 V to 5 V TTL-signals can be used for synchronization. This trigger input can be used for synchronization of the image acquisition with external signals in combination with the Fatigue & Vibration Module in VIC-Snap 10.

Trigger Outputs:

- **OUT A**: Trigger output for camera stereo system with frame rates up to 10,000 FPS
- **OUT B**: Trigger output for stroboscopic illumination with frequencies up to 100,000 Hz

USB-Port:

- USB 2.0 Interface (USB Type-B) for power and data transfer with VIC-Snap 10

Status LEDs:

- The **USB status LED** illuminates continuously when the VIC-Snap 10 is connected to a laptop or desktop computer.
- **Trigger Output LEDs** near the **OUT A** and **OUT B** connections will flash and indicate an active trigger signal.

If you have any questions about using your VIC-DAQ, please contact our Support Team.
support@correlatedsolutions.com
1.803.926.7272

2.3 VIC-DAQ with Analog Input Module

The Analog Input Module features image synchronized analog data recording with 6 analog inputs.

The analog inputs (**AIN 1** to **AIN 6**, BNC) provide an analog input range of ± 10 V with analog to digital converter (ADC) resolution of 16 bits and a sampling rate of 10 kS/s per channel.

2.4 VIC-DAQ FT with Flex-Trigger Module

Available only for the model number **ATB-V AI FT**.

ATRIG:

The Flex-Trigger Module includes the Analog Input Module and has a voltage range ±10 V for flexible signal types (rectangular, sine, etc.). This trigger input **ATRIG** at **AIN 1** can be used for synchronization of the image acquisition with external signals in combination with the Fatigue & Vibration Module in VIC-Snap 10.

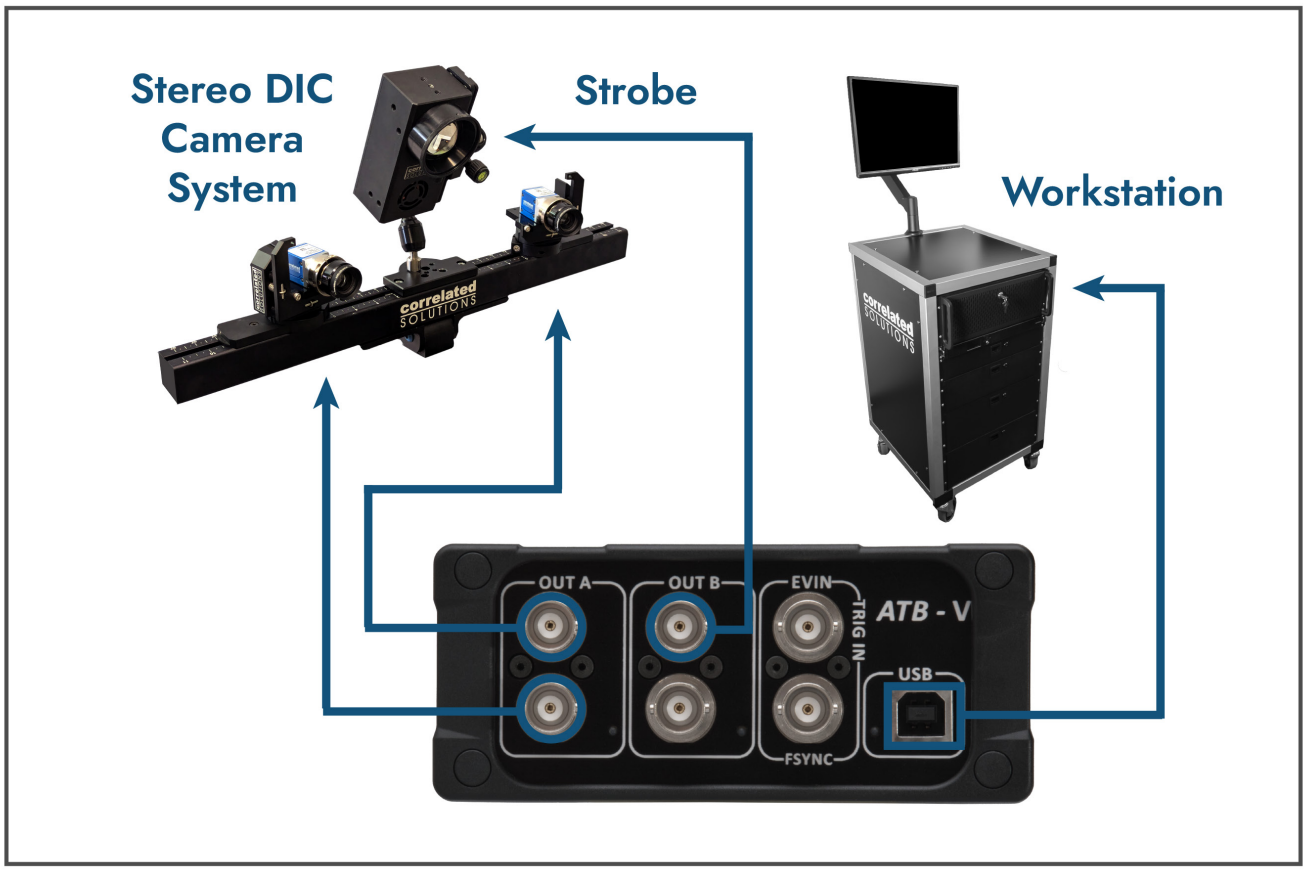
If you have any questions about using your VIC-DAQ, please contact our Support Team.
support@correlatedsolutions.com
1.803.926.7272

3. Standard Setup Schemes

The VIC-DAQ is connected via USB with a laptop or desktop computer and is fully integrated in VIC-Snap 10 data acquisition software. There are the options to use an internal or an external trigger signal for stroboscopic illumination and synchronisation of the stereo system. Triggering options such as frequency, strobe pulse, width, and delay from camera trigger (**OUT A**) to stroboscopic illumination (**OUT B**) can be set in VIC-Snap 10 as described in Section 4.

3.1 Setup for synchronization of stereo camera system and stroboscopic illumination

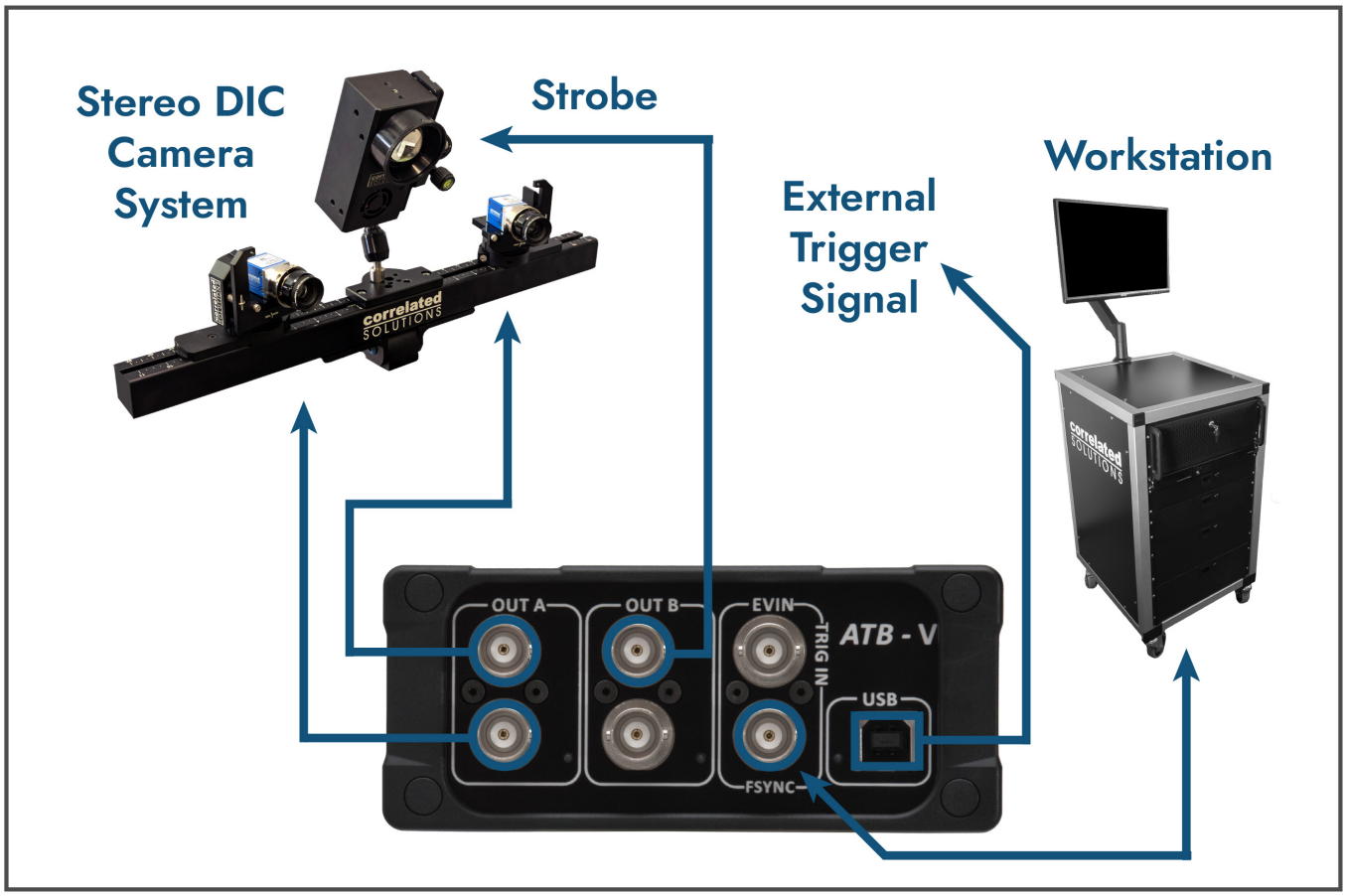
For stroboscopic Illumination synchronised with a DIC camera setup, the VIC-DAQ can be used as a trigger unit using the Internal Trigger Mode (see Section 4.6). The hardware trigger for cameras is provided through **OUT A** and the strobe pulse through **OUT B**.



If you have any questions about using your VIC-DAQ, please contact our Support Team.
support@correlatedsolutions.com
1.803.926.7272

3.2 Setup for Fatigue & Vibration Module

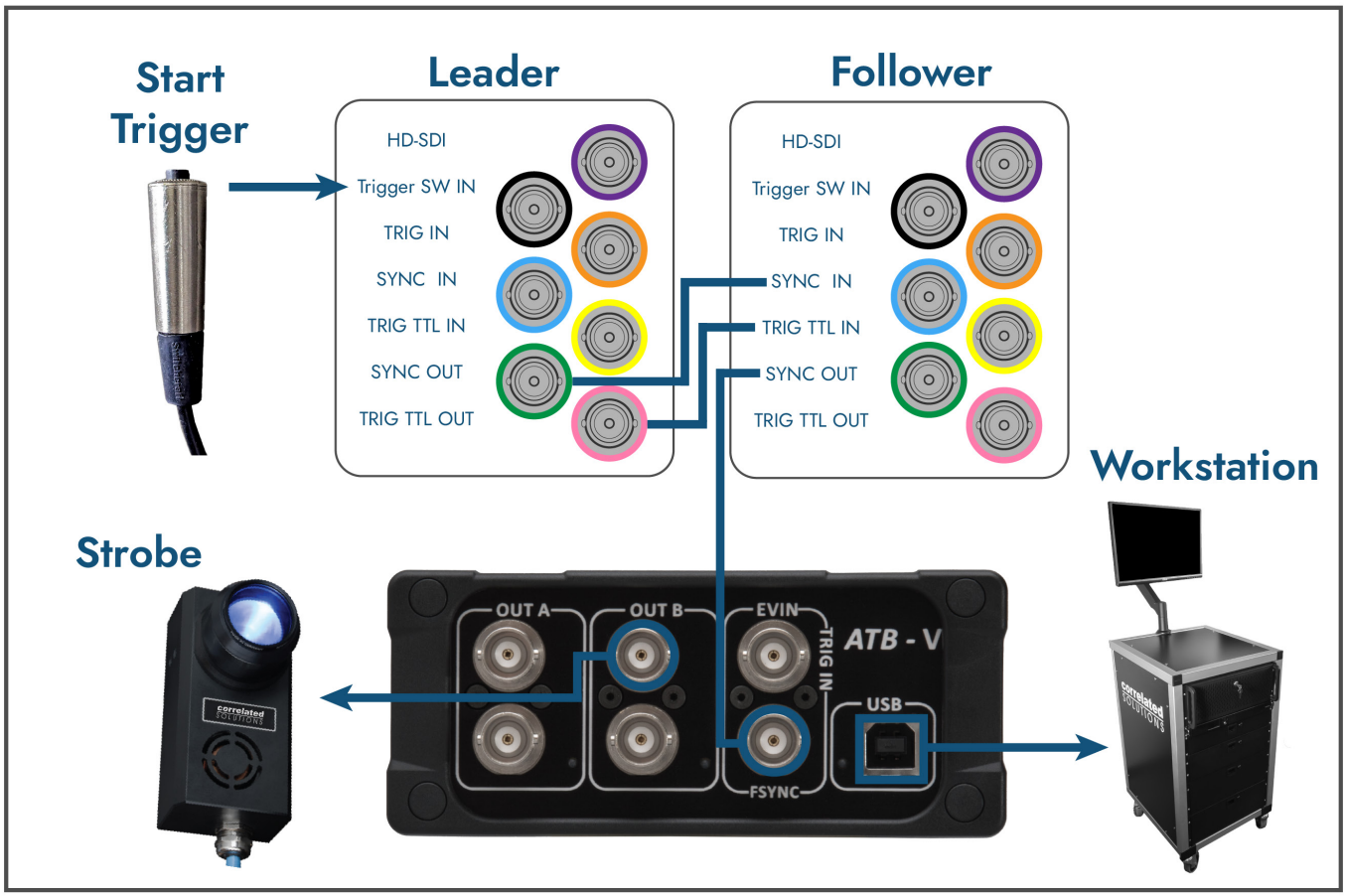
For use with the Fatigue & Vibration Module, which enables low-speed cameras to capture displacement and strain measurements from low to high-speed periodic events, the VIC-DAQ can be used in External Trigger Mode (see Section 4.7). The external trigger signal can be set to the trigger input FSYNC (0V to 5V) or ATRIG (± 10V), which is only available with VIC-DAQ FT.



If you have any questions about using your VIC-DAQ, please contact our Support Team.
support@correlatedsolutions.com
1.803.926.7272

3.3 Setup for High-Speed stereo system and stroboscopic illumination

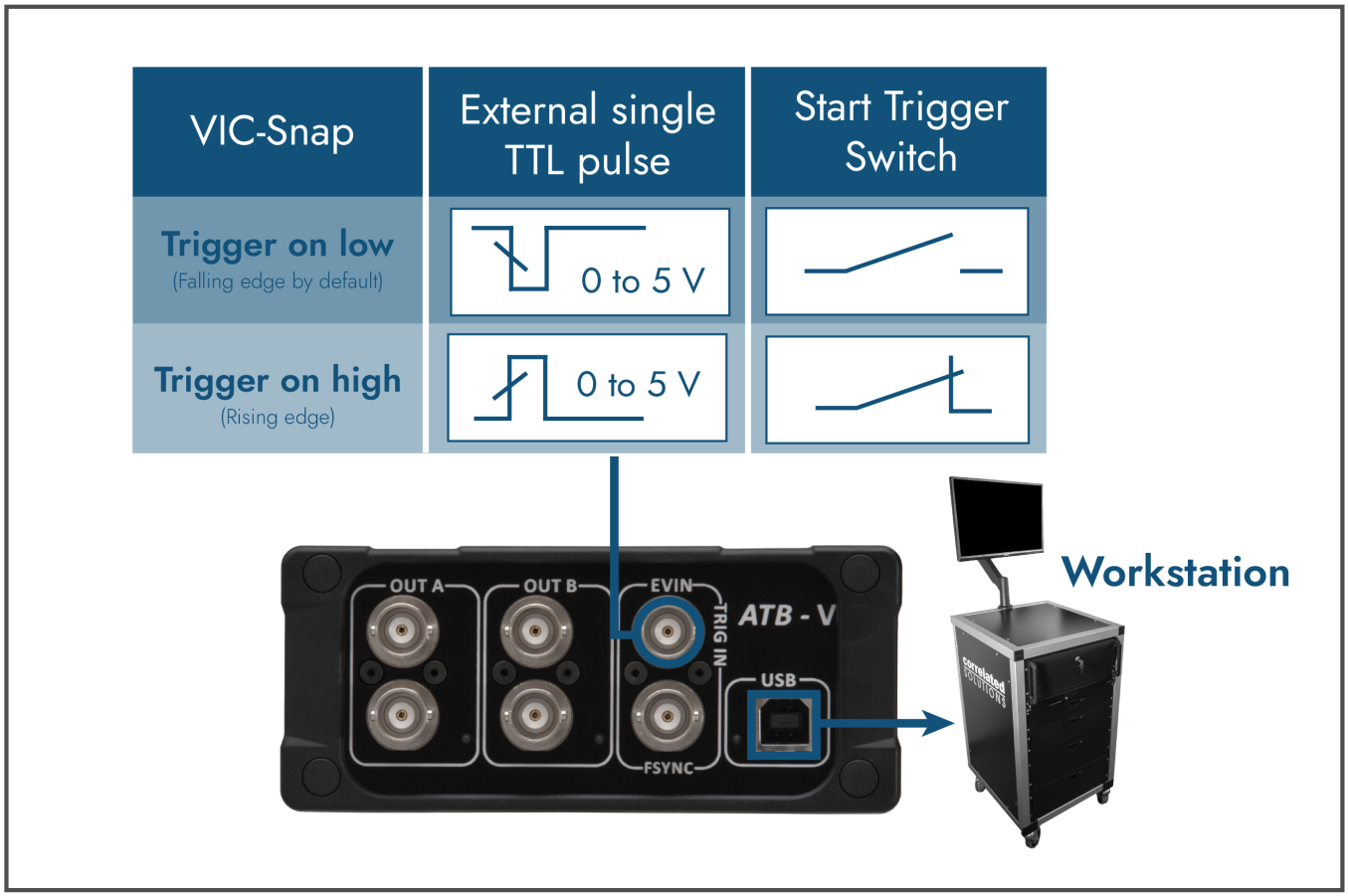
For use with a stereo High-Speed system (Photron, Phantom, etc) with stroboscopic illumination, the synchronization output of the follower camera is connected to the FSYNC trigger input. The light source is connected to **OUT B**.



If you have any questions about using your VIC-DAQ, please contact our Support Team.
support@correlatedsolutions.com
1.803.926.7272

3.4 Setup for Start Trigger for single events

For starting the image recording at a single event, the trigger signal for the single event can be set to input EVIN. A pulse signal (0V to 5V) or a trigger switch can be used, the default setting is set to falling edge or normally open (see Section 4.8).



If you have any questions about using your VIC-DAQ, please contact our Support Team.
support@correlatedsolutions.com
1.803.926.7272

4. Quick Start: Using VIC-DAQ with VIC-Snap 10

The VIC-DAQ devices are set up for operation with the VIC-Snap 10 acquisition software for Digital Image Correlation (DIC) and function as an integral part of our turnkey DIC systems by triggering the cameras and lights for stroboscopic illumination.

4.1 Installation: Computer Connection and Drivers

The connection to the computer is made by a single USB 2.0 cable Type A to B. There are no additional connections required to use the VIC-DAQ with VIC-Snap. The drivers will be automatically installed with a VIC-Snap 10 installation and will not require an additional download.

When connected, the small LED near the USB connection should be continuously illuminated. When triggering, the small LEDs near the **OUT A** and **OUT B** connections will flash and indicate an active trigger signal.

4.2 Camera Trigger

The hardware trigger for the cameras is provided through **OUT A** BNC connections on the front of the VIC-DAQ unit. Each BNC connection can support up to 8 cameras or strobes, allowing for up to 32 cameras/strobes to be triggered from a single VIC-DAQ unit through use of additional BNC “T” connectors.

4.3 Stroboscopic Illumination

There are two secondary hardware trigger connections provided through **OUT B** that can be used for stroboscopic illumination. This output features a strobe pulse length, strobe delay, and minimum strobe frequency setting within VIC-Snap 10. Pulse length mode can be set to a fixed time or as a percentage of exposure.

If you have any questions about using your VIC-DAQ, please contact our Support Team.
support@correlatedsolutions.com
1.803.926.7272

4.4 Analog Inputs

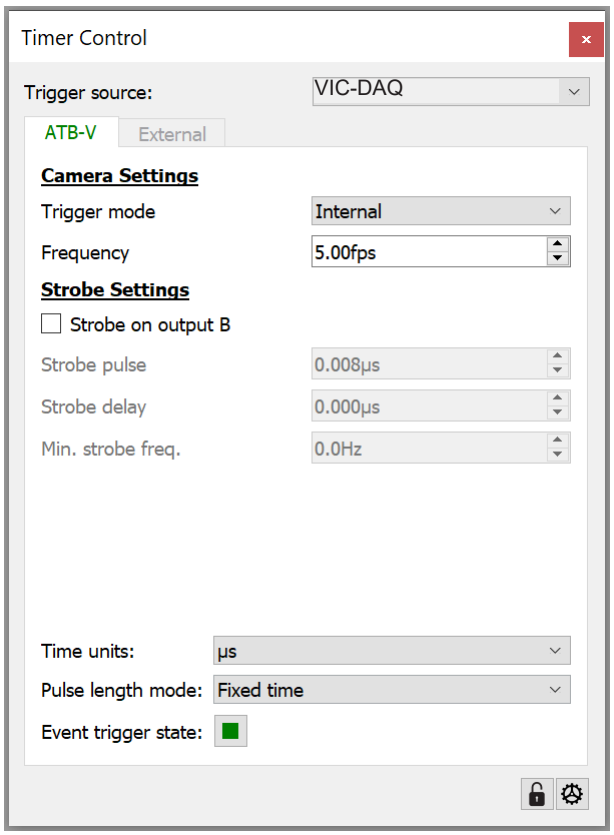
The VIC-DAQ trigger unit has 6 analog inputs (BNC) with an input range of -10 V to +10 V. The max analog input rate is 10 kS/s per channel.

4.5 Start Trigger / Event Trigger Input

The VIC-DAQ contains a connection for an event trigger. This allows users to calibrate more easily with a pickle switch.

4.6 Operation: Timer Control with Internal Trigger Mode

Select the **Timer Control** option in the Capture Function. The settings and parameters for triggering and synchronizing the stereo camera system and stroboscopic illumination can be adjusted here for the VIC-DAQ as described below.

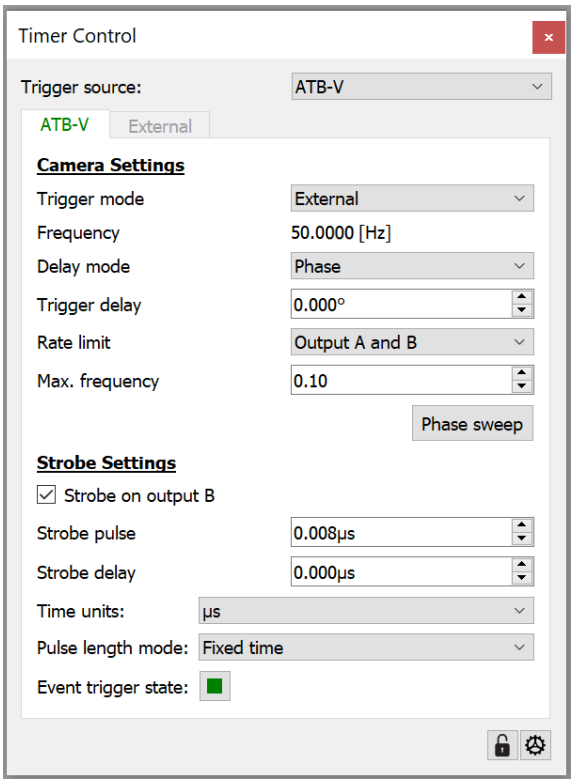


- Select VIC-DAQ as **Trigger source**.
- Select the **Trigger mode** to **Internal**, if no external trigger signal for synchronisation is used.
- Set **Frequency** for maximum camera frame rate.
- Select **Strobe on output B** if a light source is connected to OUT B for stroboscopic illumination.
  - Set parameters for **Strobe pulse** for pulse width, **Strobe delay** for delay time between OUT A and OUT B, and **Min. strobe freq**. for the minimum strobe frequency.
  - Select the **Time units**
  - **Strobe Pulse Duration** can be set with either Fixed time, Exposure %, or Phase arc.

If you have any questions about using your VIC-DAQ, please contact our Support Team.
support@correlatedsolutions.com
1.803.926.7272

4.7 Operation: Timer Control with External Trigger Mode

The VIC-DAQ trigger unit can be used to synchronize the image acquisition to an external digital signal (0 to 5V) at input FSYNC or with the VIC-DAQ FT with an external analog signal (± 10 V) at input ATRIG using the Fatigue & Vibration Module.



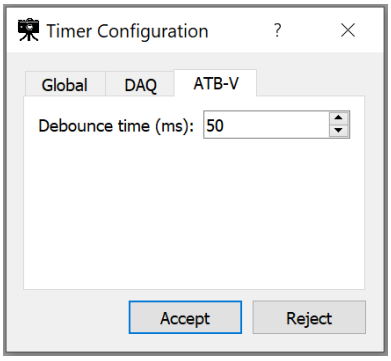
- Select ATB-V as **Trigger source**.
- Select the Trigger mode to External trigger, if a trigger signal for synchronization is connected to the FSYNC (digital) or ATRIG (analog) input.
- Set **Frequency** for maximum camera frame rate
- Select Strobe on output B if a light source is connected to OUT B for stroboscopic illumination
  - Set parameters for Strobe Pulse for pulse width, Strobe delay for delay time between OUT A and OUT B, and min. strobe freq. for the minimum Strobe Frequency
  - Select the **Time units**
  - **Strobe Pulse Duration** can be set with either Fixed time, Exposure %, or Phase arc.

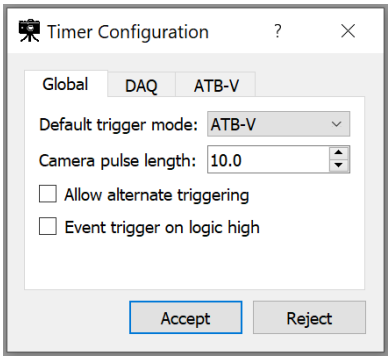
4.8 Timer Configuration

The configuration of the event trigger input can be selected with the configuration dialog accessed by clicking the gear icon.

Under the global tab you can select the rising or falling edge by the **Event trigger on logic high** checkbox. It is cleared by default so that the make/ break switch works as expected.

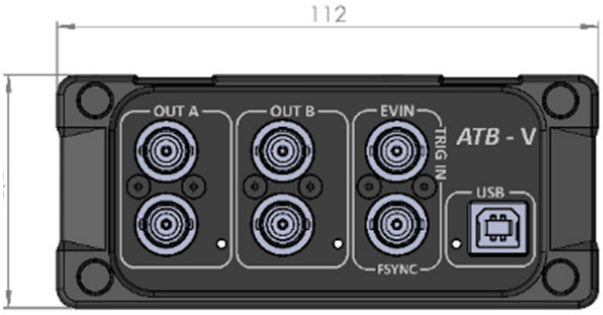
The **Debounce time** for the event trigger input is set to 50 ms by default.

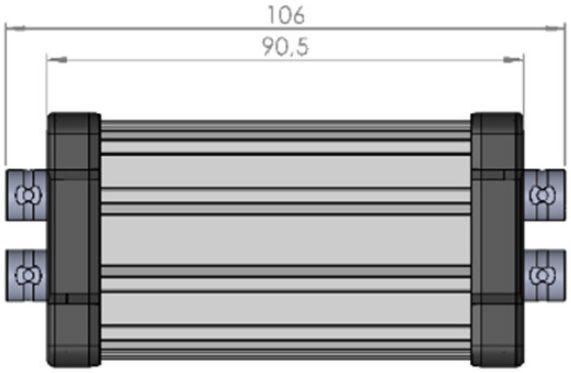


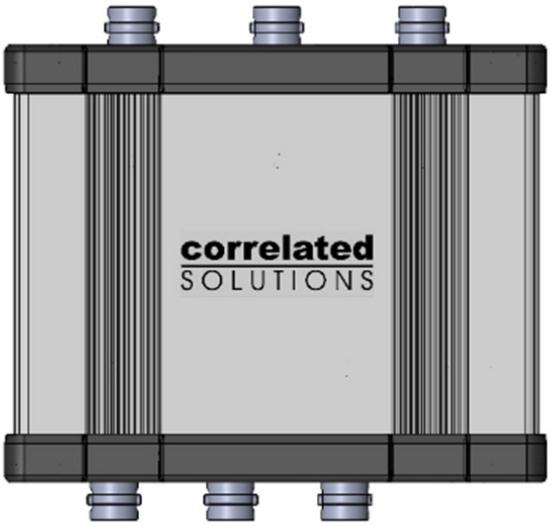


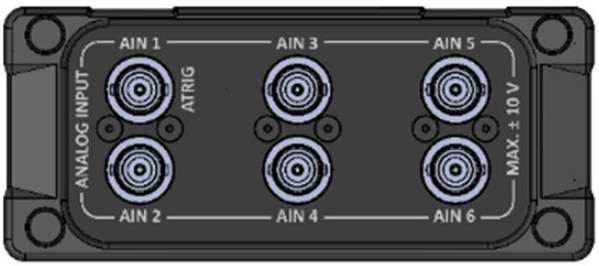
If you have any questions about using your VIC-DAQ, please contact our Support Team.
support@correlatedsolutions.com
1.803.926.7272

5. Technical Specifications







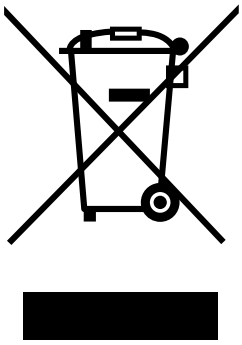


	VIC-ATB	VIC-DAQ	VIC-DAQ FT
TRIGGER FUNCTIONALITIES			
Trigger Output OUT A	0 to 5 V, max, 30 mA per Connector, Up to 10,000 HZ (Output A), Short-circuit proofed, 2 x BNC		
Trigger Output OUT B	0 to 5 V, max, 30 mA per Connector, Up to 100,000 HZ (Output B), Short-circuit proofed, 2 x BNC		
Event Trigger Input EVIN	0 to 5 V, TTL, Pull-Up to 5 V		
Trigger Delay (SYNC in/Trig out)	48 ns +/- 8 ns		
Minimum Trigger Pulse Width	8 ns		
VIC FATIGUE / VIBRATION MODULE (SYNCHRONIZATION TO EXTERNAL DIGITAL SIGNALS)			
Synchronization Input FSYNC	0 to 5 V, TTL, abs. max. +7 V		
VIC FATIGUE / VIBRATION MODULE (SYNCHRONIZATION TO EXTERNAL ANALOG SIGNALS)			
Flexible Trigger Input ATRIG			+/- 10 V
VIC ANALOG DATA RECORDING			
Analog Input Channels		6 (single ended), A1 1 to A1 6	
Analog Input Range		+/- 5 V, +/- 10 V	
Max. Input Range		+/- 12 V	
Analog Sample Rate		60 kS/s, 10 kS/s per channel	
ADC Resolution		16 bits	
Analog Bandwidth (-3dB)		5.6 kHz @+/- 10 V Input Range 2.8 kHz @ +/- 5 V Input Range	
ADC SNR:		96.4 dB @+/- 10 V Input Range 95.5 dB@ +/- 5 V Input Range	
OTHER TECHNICAL SPECIFICATIONS			
Operating Voltage	+5 VDC		
Interface Connection	USB Port		
USB Cable Length	3 m		
Dimensions	112 x 106 x 48 mm		
Weight	285 g	365 g	365 g
Ambient Temperature (Operating | Storage)	0° C to +45° C | 0° C to +70° C		
Relative Humidity (%) | Max. MASL	10% to 90%, non-condensing | 2000 m		

If you have any questions about using your VIC-DAQ, please contact our Support Team.

support@correlatedsolutions.com
1.803.926.7272

4. Conformance, Malfunction, & Warranty



In case of malfunctioning or damaged system components, please contact us directly as the manufacturer. After consulting the manufacturer, please return the damaged device with all the accessories.

All maintenance or repair work, in particular the opening of the device and any adjustments, are to be done only by qualified specialists of the manufacturer, who are aware of the dangers involved.

The warranty period for Correlated Solutions components (excluding consumable items) is 1 year after delivery. The warranty expires in case of improper treatment or improper interventions (such as opening of the casings, etc.).

We reserve the right to modify the hardware and software delivered in relation to the manual. Please contact us in case of doubts and inconsistencies.

If you have any questions about this document or any other questions, comments, or concerns about our software, please contact us at support@correlatedsolutions.com, or visit our website at *correlatedsolutions.com/support*.