



EZMotion

INSTALLATION/SOFTWARE/USAGE

Q: Question

How is the maximum framerate for EZMotion achieved?

A: Answer

The current measurement rate for EZMotion is equal to the framerate shown in any live view. It is shown as a Hz value, in the left camera view, above the exposure time listing. This number can fluctuate based on direct lighting, target movement, ambient lighting, and camera settings. Each camera has its own framerate, but they need to take synchronized images to make a measurement. This means the system runs at the speed of the slowest camera.

Camera settings involve the trigger time for each camera and are already optimized before the unit is shipped. Generally, internal camera settings cannot be changed by the customer. Following this how-to should increase the measurement rate to the highest level the system can achieve. If the measurement rate is still not high enough, please contact EZMetrology Support for more help with the system.

Start with full frame/ Manual ROI cleared in Acquisition tab. This will allow the camera to hit its rated maximum. Standard definition cameras maximum, full image, frame rate is 167 Hz. Standard definition cameras are used on Engine and Wheel tracking systems. High-definition cameras max out the full image, frame rate at 45 Hz. High-definition cameras are used in Portable and Matix systems. If the maximum frame rate is not achieved to these values, please adjust the lenses, lighting, and exposure to bring the framerate up.

Lenses:

EZMotion systems generally come with two or more sets of lenses. The typical focal lengths are 8mm, 12.5mm, and 25mm. The longer the focal length, the more zoomed in the image will be but there will be less extra space for movement or reducing image size. Generally, 8mm lenses are a good place to start if higher than 200hz measurement speed is required. These show the widest area, allow for the most tracker movement, and are best for tracking from 0.3m to 1.2m distances. Trackers may appear smaller in this lens. Tracker and Dot size sliders may need to be adjusted. Changing lenses will require a recalibration of the cameras.

**Exposure:**

Exposure is shown per camera in the Acquisition tab in EZMotion. It is shown, per camera, as a millisecond value (ms). This is the amount of time the camera will take to take a picture. The lower this number can get the faster the measurement rate should be. For best results, both cameras should be at an exposure very close to each other. Adjusting Aperture or Focus rings on the lenses will require a Calibration of the cameras.

Exposure is automatically adjusted by the system, but each lens has a manual aperture adjustment ring to change the amount of light allowed through the lens. This ring is on the barrel of the lens and is generally the thinner of the two rings. The other ring is the focus adjustment. There may be set screws on the ring that need to be loosened before the ring will rotate smoothly. The numbers on the ring help give a reference point for adjustment. Lower numbers mean a more open aperture and more light will be allowed through. While tracking a tracker with the system, adjust the aperture ring until the exposures of the cameras match closely and the framerate maxes out. Retighten any set screws on this ring when finished. The focus ring may need to be adjusted after the aperture has been changed.

Lighting:

When fast framerate is needed, more light will be required. More light allows the camera exposure to be adjusted lower and require less time to take a frame. Outside lighting is best on a cloudy day where the lighting is bright and constant with few hard shadows or blinding reflections. EZMotion wheel and engine systems come with two LED lights pre-installed. Portable system comes with eight lights which can be individually plugged in or unplugged depending on the needed lighting. Matix system will have at least one light per camera and may have more. Using the LED lights outside will help keep a constant brightness minimum when a shadow happens.

Region of Interest:

Manual Region of Interest controls the amount of sensor and image the cameras use. Region of interest can be selected in the Acquisition tab of Motion by clicking and dragging on each image. The purple box being draw is the user selection. Once drawn, a green box will show which is the sensor area that the camera can use based on the user selection. Reducing the sensor size will reduce the amount of data in each image being sent to the computer and increase the framerate. If the image size for one camera is larger than the other, the cameras will run synchronized at the lower camera's frame rate. The size of the image should be just big enough to contain the entire movement of the trackers. This should give the fastest framerate available to EZMotion.