

Fundamentals of Rapid and Continuous Capture Modes

The Quadrus EZ can capture images in two modes: **Rapid** and **Continuous**.

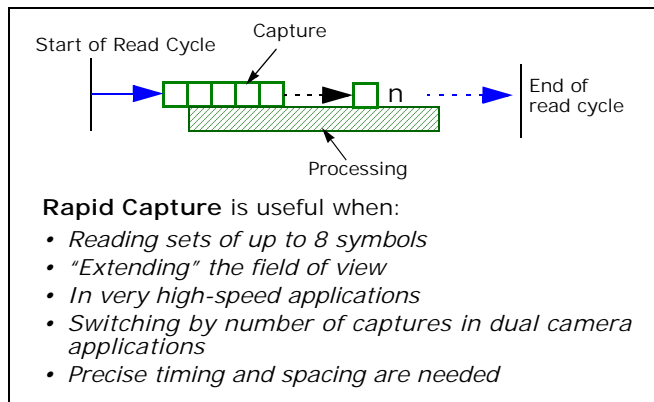
Rapid Capture

In rapid capture mode, from one to eight captures can be specified along with time delays between captures. In this mode the only built-in delay is the time for image capture and transfer. After the initial capture has been transferred, decoding begins and is processed simultaneously with and independently of subsequent captures.

The functionality of **Rapid** is:

- There is no wait between captures for processing
- From one to eight captures can be user-defined
- Time delays between captures can be individually user-defined

Figure 1. Rapid Capture



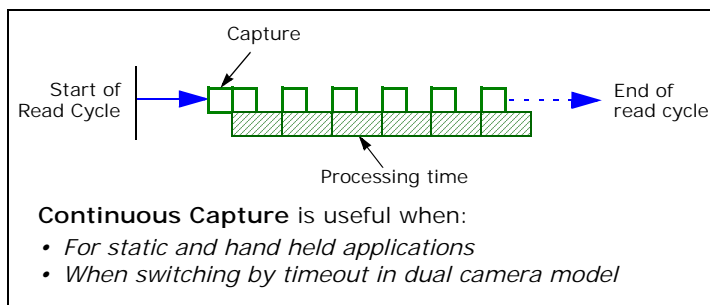
Continuous Capture

In continuous capture mode, captures are continually taken throughout the read cycle in a double-buffered format so that the first image starts processing while the second image is being captured. The third capture will then start when the first is completely processed and the second is completely transferred.

The functionality of **Continuous** is:

- Processing occurs between captures
- The number of captures during a read cycle is unlimited
- There are no user-definable delays between captures.
- Time between captures cannot be predicted with any precision.

Figure 2. Continuous Capture



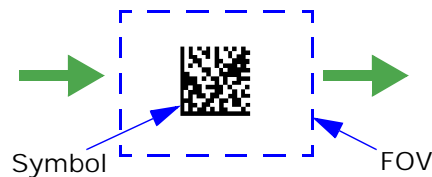
With Single and Multiple Captures

With Single Capture

When you first load ESP-EZ, the default for capturing is **Rapid Capture** and **Number of Captures** set to 1.

This mode will work well with many moving applications. When coded objects are tightly spaced, the preferred setup is **Rapid Capture** set to **Last Frame**.

In the sketch to the right, a trigger is used to time the capture to occur when the symbol is in the center of the FOV.



With Multiple Captures

Continuous is preferred in a static or indexed application where more than 8 reads are needed to ensure a good decode. This is accomplished by increasing the timeout to extend the read cycle.

Rapid Capture can improve opportunities for good reads in many applications by increasing the number of captures while in the field of view.

The sketches on the following page show dynamic multiple captures with no user-defined time delays added between them. However, since a built-in or "overhead" capture time (15mS for CCD and 30mS for CMOS) exists after each capture, some spacing between captures will be noticeable in higher speed applications.



- An ideal setup would look like this where overlapping symbols fall within or mostly within the FOV.

- This shows an acceptable pattern where at least one symbol can be expected to fall within the FOV.

- The spacing here is not acceptable since it is too wide to guarantee that any of the symbols will fall within the FOV.

With Configuration (IP) Database

Configuration Database allows the user to define up to 10 indexes of configuration settings that, when enabled, are applied to sequential image captures.

Since in **Rapid Capture** mode a capture can occur during image processing, it is not possible to modify any image processing settings in this mode and only camera settings (shutter speed, gain, etc.) in the database will be applied.

The configuration database includes the following settings:

		Rapid	Continuous
Camera Settings	CCD camera settings (Shutter Speed, Gain)	Yes	Yes
	CMOS camera settings (Shutter Speed, Gain, Contrast, and Offset)	Yes	Yes
Image Processing	Threshold, Fixed Threshold Value, Processing Mode, Reverse Video, and Narrow Margins	No	Yes

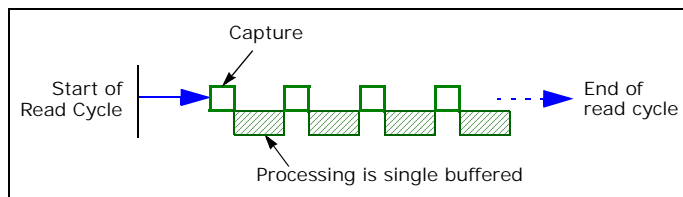
Configuration Database: When a read cycle begins, the reader applies index 0 settings of the configuration database for the 1st image capture and for subsequent captures applies index settings in ascending order until the last active index is reached. At that point the reader starts back at index 0. At the end of a read cycle or a calibration routine, if a decode has occurred, the settings that were applied to that decode will move to the top of the database.

Continuous Capture when used with configuration database is modified to permit a single buffered format: capture-process, capture-process, etc. Compare Figure 3 here with Figure 2 on page 1.

A good example in which continuous would be preferred is an application in which both light and dark background symbols are presented.

Rapid Capture, although less flexible than continuous since it omits image processing settings in configuration database, will still be the preferred mode in most dynamic applications.

Figure 3. Continuous Capture in Configuration



Rapid vs. Continuous Comparison Summary

	Rapid	Continuous
Captures delayed by processing?	No	Yes
Number of captures in a read cycle?	1 to 8	Unlimited
User-definable delay before first capture?	Yes	Yes
User-definable delays between captures?	Yes	No
Extends the FOV by overlapping captures?	Yes	No
Suitable for static and slow applications?	Yes	Yes
Can do a single capture per read cycle?	Yes	Yes
Works with multiple symbols ("multilabel")?	Yes	Yes
Are ALL configuration database settings operational?	No	Yes