

# Technical Note

## MT9P031 Global Reset Release Snapshot

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### Introduction

This technical note outlines the details for switching between modes with Aptina's MT9P031 sensor. It also describes the global reset release snapshot (GRRS) mode and provides instructions on how to:

- Enter preview mode
- Switch to global reset release snapshot (GRRS) mode
- Return to preview mode

### Global Reset Release Snapshot Mode

The GRRS mode eliminates the shearing effect that often accompanies an electronic rolling shutter (ERS) by starting the exposure of all rows at the same time. Instead of the first scan used in ERS mode, the reset to each row is released simultaneously. The second scan occurs as normal, so the exposure time for each row is different. Typically, an external mechanical shutter would be used to stop the exposure of all rows simultaneously.

In default mode, the sensor continuously samples and outputs full resolution frames. However, in snapshot or triggered mode, the sensor samples and outputs a frame only when triggered. To leave snapshot mode, it is necessary to clear the snapshot register field first, then issue a RESTART.

### Enter Preview Mode (VGA Resolution)

To place the MT9P031 sensor into preview mode:

1. Ensure that TRIGGER is set to "1" (HIGH).
2. Set R0x22 to 0x0033 to enable row binning and skipping 4X.
3. Set R0x23 to 0x0033 to enable column binning and skipping 4X.
4. Set R0x0B to 0x0001 to restart the sensor.

## Switch to GRRS Mode

Before entering GRRS mode, it is necessary to set reserved register R0x30 to “1.” Upon exiting GRRS mode, return R0x30 to default value “0.”

To take a GRR snapshot in full resolution:

1. Set R0x1E to 0x4186, enabling the global reset and the snapshot mode. To also enable the Strobe signal (for example, when using the mechanical shutter), set R0x1E to 0x4196.
2. Put the sensor in full resolution:
  - 2a. Set R0x22 to 0x0000 to enable row binning and skipping 1X.
  - 2a. Set R0x23 to 0x0000 to enable column binning and skipping 1X.
3. Wait 1ms.
4. Trigger the next frame:
  - 4a. Set TRIGGER to “0” (LOW).
  - 4a. Wait for 200ns.
  - 4a. Set TRIGGER to “1” (HIGH).

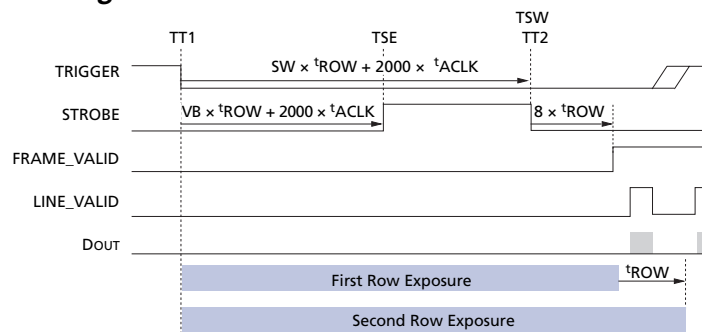
## Return to Preview Mode

To return the sensor to preview mode:

1. Set R0x1E to 0x4006 to enable continuous mode.
2. Set R0x22 to 0x0033 to enable column binning and skipping 4X.
3. Set R0x23 to 0x0033 to enable column binning and skipping 4X.
4. Set R0x0B to 0x0001 to restart the sensor.

The GRR snapshot timing diagram is shown in Figure 1.

**Figure 1: GRR Snapshot Timing**





## Conclusion

For further information on the MT9P031 GRRS feature, refer to Aptina's Web site at [www.apgina.com](http://www.apgina.com)



## Revision History

|  |           |
|--|-----------|
| Rev. C .....   | 5/8/12    |
| <ul style="list-style-type: none"><li>• Changed Micron to Aptina in “Introduction” on page 1 (published wrong version as Rev. B)</li></ul> |           |
| Rev. B .....   | 9/27/2011 |
| <ul style="list-style-type: none"><li>• Updated to Aptina</li></ul>  |           |
| Rev. A .....   | 11/6/2007 |
| <ul style="list-style-type: none"><li>• Initial release.</li></ul>   |           |

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