unitech
because we care

Global Shutter

WHY (Reason to build this technology)

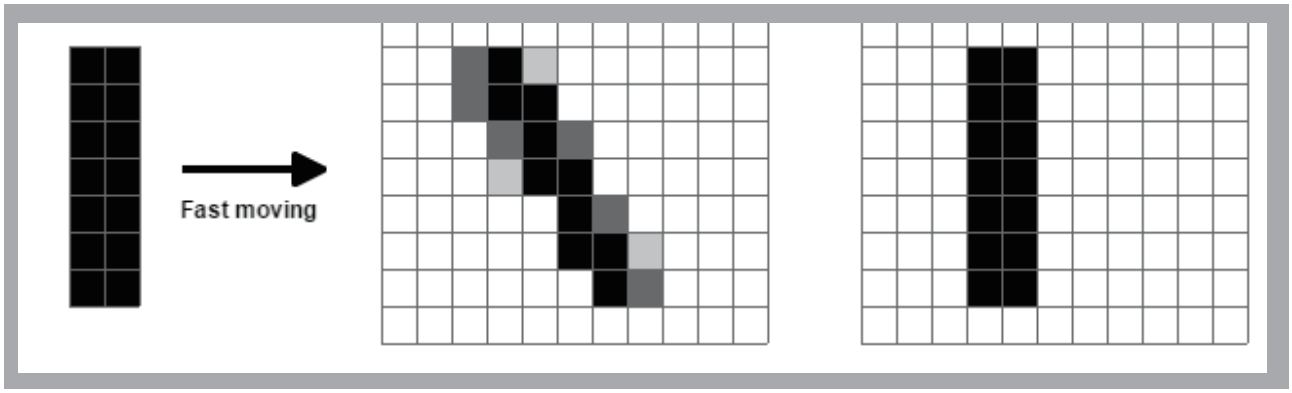
When using a handheld barcode scanner, the successful scan rate is often affected by hand jitter. This will cause user problems and affect efficiency, especially when the environment cannot avoid any hand or barcode jitters. The main cause of read failure due to jitter is because the image of a barcode will be distorted by different structures of shutter during the imaging process. Thus, this image distortion affects barcode recognition rate.

HOW (Concept of Technology)

At present, there are two kinds of shutter structure in scanners - Rolling Shutter and Global Shutter. The structure of Rolling Shutter is easily affected by image jitter, which is described as follows:

Rolling Shutter is exposed in a progressive motion which meaning every row in the image is exposed one at a time in a sweeping motion. This approach cannot avoid image distortion when the image is moving at high speed. As shown below, the barcode will be distorted and make scanners hard to read it.

Global Shutter image scanning method is different form Rolling Shutter. Since the sensor is exposed all at once, the barcode image won't be distorted by hand-jitter. Therefore, the barcode reading rage is higher than the Rolling Shutter. Thus, to increase the reading rage in mobile scanning environment, mobile scanners need to use Global Shutter technology.



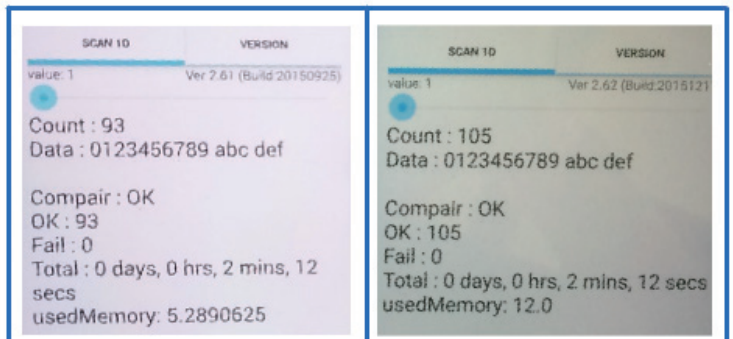
A barcode to be scanned

This image exposed through Rolling Shutter

This image exposed through Global Shutter

WHAT (Case study benefits)

unitech PA700 and PA720 adopt Rolling Shutter and Global Shutter image scanning respectively, so the read rate will be different when reading with hand-jitter.
For this, we do a simple jitter scan experiment, so that we can compare the different performance between PA700 and PA720 while scanning the same barcode for 2 minutes on a shaking platform. The performance of PA720 which adopts Global Shutter is 12% higher scan rate than PA700, which is shown in the table below.



	PA700 (Rolling Shutter)	PA720 (Global Shutter)
# of Successful Scan	93	105
Performance Percentage	100%	112%

Note: Access the following link to see the vibration experiment video on line.
https://youtu.be/sRbH3Yn-ros