

# Progressive Scan Technology

## The evolution of Progressive Scan technology

Introduced in the early 1990s, Progressive Scan remains the main Sony technology in the evolution of industrial imaging for many high-speed applications. The term "Progressive Scan" relates to a specific design of CCD. In this design, images are acquired through a progressive integration mode that has been specifically developed to meet the need for a high quality imaging solution.

## Conventional picture integration modes

The current generation of conventional CCD sensors are designed for use in the interlaced scanning systems of video and TV. These systems have two fields, each of 262.5 (EIA) or 312.5 (CCIR) scanning lines, interlaced to form a single 525 or 625-line, 1/30 or 1/25 second picture. To be displayed, each video picture is processed using one of two alternative signal charge integration modes:

- Field integration mode uses the double integration of two adjacent lines, giving low vertical resolution but high dynamic resolution. This is the preferred method for most live video applications
- Frame integration mode uses the integration of each odd line after integrating each even line, giving high vertical resolution but low dynamic resolution. This is the preferred method for shooting still objects, such as captions.

## The Progressive Scan concept

In some industrial applications, problems occur when a camera shoots fast moving objects. This is due to the time delay between the acquisition of odd and even fields – the picture appears blurred if an object is moving quickly compared to the CCD refresh rate. One solution is to use only one field, which reduces the vertical resolution. Other solutions are to use a mechanical shutter or an external strobe light (extra cost and lower reliability). The best answer is the application of Progressive Scan technology which uses a revolutionary progressive scan CCD sensor. This sensor is specifically designed to integrate all the lines at the same time - producing sharp, clear and high-resolution pictures in all circumstances.

## How Progressive Scan functions

In the field integration mode, the charges from two adjacent pixels are mixed together and then transferred to the vertical register. In the frame integration mode, the charges from odd lines and even lines of pixels are alternatively transferred to the vertical registers.

In a Progressive Scan CCD, the charges from all the pixels are transferred to enhanced vertical registers. These charges are then transferred to one or two horizontal registers.

Progressive Scan cameras featuring dual outputs can capture up to 60 full frames per second.

## Applications benefiting from Sony Progressive Scan cameras

For industrial applications, Progressive Scan cameras combined with square pixel CCD sensors represent the optimum solution for high-speed shooting applications such as traffic control, quality control, factory automation, machine vision applications, etc. For applications involving image measurement or still imagery where the highest resolution is required, the Sony Progressive Scan CCD provides high resolution, blur-free images which represent an excellent solution for scientific imaging applications.

## Sony Progressive Scan Cameras

New Sony Progressive Scan products for 2000-2001 bring further expansion to the line up! Now including seven analog models: the XC-HR300 (please refer to page 14), XC-55 and XC-55BB/1 (page 16), XC-7500 and XC-8500CE (page 15), as well as one 3-CCD model, the DXC-9000/1 / 9100P (page 26). It also includes six digital models: the XCD-X700 and XCD-SX900 (page 10), DFW-X700 and DFW-SX900 (page 20), DFW-V500 and DFW-VL500 (page 21).