



**ProCamHD™: Capturing the Ultimate  
High-Definition/Digital Image Perspective  
ProCamHD vs. CCD**

New camera and transmission technologies are giving viewers better pictures with the continuing roll out of high-definition television (HDTV). One of today’s most vocal proponents of HDTV is the FCC, which is steadfast in its resolve that technology will progress to provide high-quality, cost competitive options that will allow broadcasters to implement HDTV on a widespread scale. Meanwhile, technology companies continue to roll out new components and hardware that can improve images captured by security monitoring devices.

With the mandate to switch to HDTV by 2006, the broadcasting industry must find new technologies and products that will ease the transition – and the security industry can also benefit from these changes. The bigger challenge is that the broadcasting industry has enjoyed relatively unchanged camera standards for more than 50 years- and CCD technology for the last 20 years. AltaSens now offers broadcast and security camera manufacturers a cost-effective, highly efficient superior imaging alternative with CMOS-based ProCamHD. As broadcast and security camera technology expands its resolution to accommodate HD at the necessary frame rates, AltaSens anticipates that two factors will contribute to the growth of CMOS technology in professional grade cameras: 1) Integrated circuit technology used for memory and microprocessors continues to improve; 2) a basic architectural difference relative to CCD sensors is enabling CMOS imaging systems-on-chip (I-SoC).

<b>Feature</b>	<b>CCDs</b>	<b>ProCamHD</b>	<b>CMOS-Based ProCamHD Advantage</b>
<b>SIZE</b>		X	Imaging System-on-a-Chip (I-SoC) architecture results in a smaller footprint than CCDs with required additional chips.
<b>POWER CONSUMPTION</b>		X	Even with high-speed A/D converter, consumes less than 20% of the power required for a comparable HDTV CCD engines (including additional chips)
<b>INTEGRATION</b>		X	I-SoC is ideal for design into state-of-the-art cameras. CCDs require additional chips for image processing
<b>FRAME SPEED</b>		X	Many HDTV CCD sensors operate at 24 fps progressive, ProCamHD operates at 60 fps progressive / 120 fps interlaced at full HD resolution
<b>VIDEO DYNAMIC RANGE</b>		X	Delivers >68dB at its full 150 MHz data rate. CCD’s dynamic range is reduced as data rate increases (generally to 50-55dB)
<b>SYSTEM NOISE</b>		X	Patented “Tapered Reset” design reduces read noise to <10e- compared to CCDs traditional noise floor of <100e-
<b>OUTPUT RESOLUTION</b>		X	12-bit output better matches the dynamic range of film than competing CCDs (which are generally 10-bit)
<b>COST</b>		X	Is lower cost than comparable CCD devices, enhancing the user’s profitability
<b>SENSITIVITY</b>	X	X	Competitive sensitivity to CCD technology if CCD’s 2-line mixing not used, but mixing degrades vertical resolution
<b>ANTI-BLOOMING</b>		X	No vertical smear is induced by even very bright highlights
<b>FILL FACTOR</b>	X	X	ProCamHD microlenses improve fill factor, even at today’s small pixel pitches – higher fill factor than progressive FIT CCD and competitive fill factor to interlaced FIT CCD
<b>SENSOR DYNAMIC RANGE</b>	X	X	Though CCD’s higher operating voltage allows larger sensor dynamic range, ProCam supplies full 12 bit video at 150 MHz for 3.3V operating voltage