

Pixim D2500 Video Imaging System for Advanced CCTV and IP Cameras

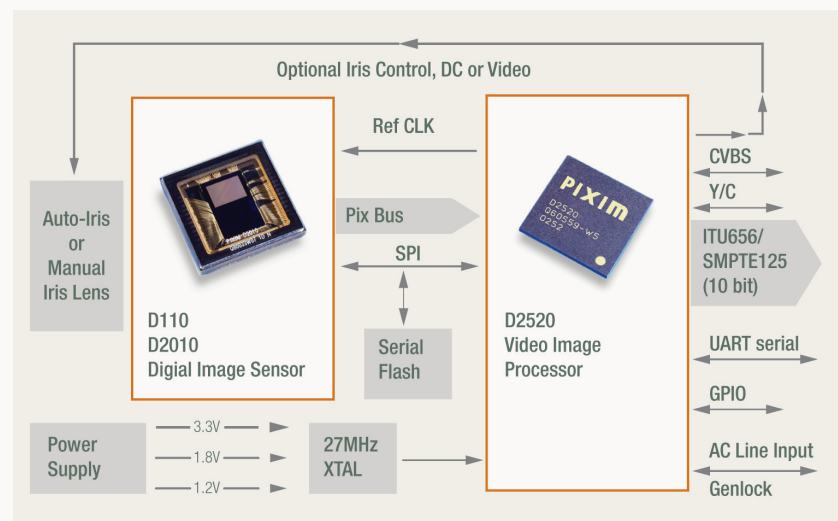
Highlights

- › **High resolution color for crisp, clear video**
 - 540 HTVL equivalent (RGB)
 - Progressive image capture
 - Global electronic shutter
- › **High sensitivity for low-light images**
 - Advanced noise reduction technology
 - 0.5/0.8 lux (CMY/RGB) minimum illumination, f/1.2, 50 IRE
- › **Wide dynamic range provides excellent image quality in high-contrast environments**
 - 102 dB typical
 - 120 dB max
- › **Single camera SKU supports NTSC, PAL, and TCP/IP cameras**
 - Analog: Composite, S-Video, YUV/RGB, Differential Composite (for unshielded twisted pair wiring)
 - Digital: 10-bit parallel digital video (ITU/BT656, SMPTE 125)
- › **Optimum Exposure Mode presets**
 - Best pictures in a variety of applications
- › **Numerous control options**
 - Automatic White Balance
 - Backlight Compensation
 - AC line lock, internal or external sync
 - Automatic Gain Control
 - On-Screen Display
 - Activity / motion detection
 - Electronic Iris
 - Digital Pan / Tilt / Zoom
 - Configurable alarms
 - Auto-Iris control (DC or video)
 - Day / Night

The 'Orca' D2500 is a highly integrated two-chip set utilizing Pixim's innovative Digital Pixel System[®] technology that provides the image sensor, image processor, and the necessary intelligence to develop advanced-feature, high-quality, cost-effective color CCTV and IP cameras. The D2500 is designed to deliver superior quality video, providing up to 102 dB dynamic range in typical operation (120 dB max) while providing excellent resolution, sensitivity and color fidelity. The image sensor is available with either complementary (CMY) or primary (RGB) color filter array allowing pin-compatible choice of the highest sensitivity or the highest resolution.

The D2500 includes configurable software which allows camera manufacturers to get to market quickly and offer a number of camera products from a common base hardware design, including an option to select PAL / NTSC operation via software or switch. Simultaneous analog (composite, S-video, or component) and digital outputs are available, as well as a differential composite output to support analog video over unshielded twisted pair (UTP) wiring.

The D1110 and D2010 digital image sensors and D2520 video image processor are manufactured in low-power, high-volume commercial CMOS processes. The low power dissipation enables high performance camera designs under 1.5 watts.



Specifications

D2010(CMY) & D1110(RGB) Digital Image Sensor

- › Pixel type: Digital Pixel System technology
- › Silicon process: 0.18 μ m CMOS
- › Image size: diagonal 6.3 mm (1/3 inch optical format)
- › Sensor array size: 5.04mm (H) x 3.78 mm (V)
- › Pixel size: 7 μ m x 7 μ m
- › Picture elements: Total: 742 (H) x 552 (V); effective: 720 (H) x 540 (V)
- › Color filter array:
 - Complementary (CMY: D2010)
 - Primary (RGB: D1110)
- › Dynamic range: 102 dB typical, 120 dB max
- › Horizontal resolution:
 - 540 horizontal TV lines equivalent (with High Resolution RGB kernel)
 - >504 TV lines typical (RGB)
 - 500 horizontal TV lines equivalent (CMY)
- › Vertical resolution: 460 TV lines
- › Minimal blooming
- › Zero smear

D2520 Video Image Processor

- › Silicon process: 0.13 μ m CMOS
- › ARM™ processor core
- › Custom image pipeline
- › Wide dynamic range
- › Built-in NTSC/PAL video encoder
- › Extensive programmability

- › DIP switch / push-button menu support
- › Advanced on-screen display with scalable font size and outlined fonts, multiple language support including Asian characters
- › Camera ID
- › Alarms: on-screen, serial port, GPO, and zoom alarms
- › White balance: auto tracking, manual, and presets
- › Gamma correction options
- › Global electronic shutter
- › Extended slow shutter
- › Automatic gain control
- › Backlight compensation control
- › B/W mode
- › Image flip: horizontal and vertical
- › Four user configuration sets
- › Digital Pan/Tilt/Zoom (1x to 4x zoom)
- › Exposure control: up to 1/30,720 second electronic shutter at f/1.2
- › Iris selection: DC, Video, Manual lens support
- › Auto iris output: Video or DC drive using internal PWM DAC
- › AC line lock autosense
- › Full color genlock
- › Progressive scan output
- › Image freeze
- › Day / Night modes including support for IR filter exchanger

Temperature Range

- › D2010 & D1110 Operation: -10° to 60° C ambient
- › D2520 Operation: -10° to 60° C ambient

System Interfaces

- › Boot Flash: Serial Programming Interface (SPI) Flash memory, reprogrammable via PC connection
- › Iris Control: DC or video
- › CVBS: Composite video signal (75 Ω output) (up to 3)
- › Y/C: standard S-video output (75 Ω output)
- › YUV: component output (75 Ω output)
- › Differential Composite (for unshielded twisted pair)
- › External Sync: H, V TTL output
- › Parallel video: ITU-R656 format 8-bit; SMPTE 125M 10-bit video (CCIR 601)
- › UART: general purpose for configuration, alignment, and remote control (RS232 / RS485)
- › GPIO: 14 general input/output pins for camera modes via DIP switches or push buttons

Power

- › D2010 & D1110: Standard 1.8V (core) and 3.3V (I/O) supply
- › D2520: Standard 1.2V (core) and 3.3V (I/O) supply
- › Typical power: <1.25 W for D2500 chip set
- › Max. power: <1.5 W for D2500 chip set

Package

- › D2010 & D1110: 17mm x 17mm; 181 BGA, 1mm ball pitch
- › D2520: 15mm x 15mm; 144 BGA, 1mm ball pitch

System Tools

- › Camera Development Kit (CDK)
- › Property Access Tool (PAT)
- › Heater Control Board

Pixim® Digital Pixel System® Technology

Pixim's patented Digital Pixel System technology marks a fundamental breakthrough in imaging technology. Built upon technology developed at Stanford University in the 1990s, Pixim has created an image capture and processing system that provides high-quality pictures with enhanced dynamic range that significantly improves image quality in scenes consisting of both bright and dark areas.

The core invention is the inclusion of an analog-to-digital converter (ADC) within each pixel of the image sensor. The ADC translates the light signal into a digital value at the immediate point of capture, thus minimizing signal degradation and cross-talk in the array and allowing for greater noise reduction methods. Once the data is captured in a digital format, a variety of digital signal processing techniques are used for optimal image reproduction.

