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DS600

11.6” Cheetah Smart Display family for rugged applications

SPECIFICATIONS

Display (Color TFT with capacitive Touch Screen)

- Size (aspect ratio) : 11.6” Diagonal (16:9)
- Resolution : 1920 x 1080 (Full HD)
- Display Luminance : 600 NITS

Single Board Computer (SBC)

- Intel ATOM® x7-E3950 quad core processor with 4 GB DDR3L RAM
- Integrated graphics processor (GPU) with video overlay, scaling & blending
- Increased H.264 compressed video encode and decode/playback performance
- Onboard 64 GB SATA SSD and optional mSATA storage up-to 1024 GB

Standard Video Processing Module (VPM)

- Up-to 4x 3G-SDI video inputs
- Scaling, de-interlacing, alpha blending, PIP, Text Overlay etc.
- 10-bit 4:4:4 video processing with high-bandwidth video pipeline
- Other standard VPM input options are also available, consult OEM for details

Interfaces

- 1x Ethernet 10/100/1000 Mb/s
- 2x USB 2.0, 1x USB 3.0 (option), 2x RS422, 1x RS232/422, CAN (option), GNSS (option), 2x GPInput
- User definable hard keys (x6) and soft keys, Power On/Off switch
- +28VDC MIL-STD-1275E Power input

Order Options (Generic order code = DS6X-I-O-U-CG-AS-R)

- X: VPM: (0, 2X, 6X) 0=No VPM, 2X=Standard VPM, 6X=Custom VPM
- I: Video Inputs (mDnA) m=Digital(D), n=Analogue(A) number of inputs
- O: Video Outputs (mDnA) m=Digital(D), n=Analogue(A) number of outputs
- U: USB 3.0 (0,1) Number of USB 3.0 interfaces
- CG: CAN & GNSS (mCnG) m=CAN (C), n=GNSS (G) interfaces
- AS: Additional storage 0, 256, 512 or 1024 GB
- Ruggedization Level 0=Commercial, 1=Industrial, 2=Military

Standard Smart Display = DS620-I2D-O0-U0-C0G0-AS0-R1

- Standard VPM, 2x SDI in, 1x Gbe, 2x USB2, 2x RS422, 1x RS232/422, 2x GPinput
- Excluded options: Video outputs, USB3, CAN, GNSS
- Industrial ruggedization level

The **DS600** is a rugged Smart Display family featuring an 11.6” display, the latest Intel™ Atom® E3900 series of embedded processors and a Video Processing Module (VPM) for high-performance end-to-end Full HD (FHD) video processing capability, suitable for industrial and military applications. It has a sunlight readable FHD (1920x1080) color TFT display with wide viewing angles, high brightness and touch screen technology with glove support.

The **DS600** display is driven by an Intel ATOM® E3900 series based single board computer (SBC) with a quad core processor that offers exceptional efficiency with real-time video processing. The integrated graphics processor (GPU) running at up to 650MHz, achieves greatly increased video encode and playback performance, with Ultra HD 4k display resolution and features such as video and text overlay, video scaling and alpha blending.

The SBC provides an onboard SSD with Gigabit Ethernet, USB2, USB3, RS422, CAN and GPInput interfaces. An optional mSATA SSD (up to 1024 GB) is available for storage and data logging.

The Intel® Time Coordinated Computing Technology provides network synchronization to within 1µs, greatly improving the real time deterministic behavior on a system level.

Compressed (IP) video is supported through the Ethernet interface. Hardware assisted H.264/H.265 decoding supports multiple inputs, which are then further processed by the GPU. RTSP video streaming (amongst others) is supported.

The optional Video Processing Module (VPM) acts as a front-end video processor which is available in different configurations. The standard VPM option provides frame grabbing, video scaling, de-interlacing, color format and frame rate conversion of up-to four 3G-SDI inputs. It supports 10-bit 4:4:4 video processing with a high-bandwidth video pipeline.

Other standard and custom VPM options are available for PAL, RGB, HDMI and other video formats. Video output options are also available. Consult the OEM for user specific requirements.

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SOFTWARE AND FIRMWARE SUPPORT

OS & Board Support Package (BSP)

- Linux, Windows, Lynx OS, Thread-X and others
- Intel® Media SDK (Intel® Quick Sync Video), DirectX* 12, and OpenGL* 4.3
- Enhanced GPU and VPM API support, Intel oneAPI
- Computer Vision and AI, Auto Tracker and Multi-Target Tracking
- Example software application provided

Custom Video Processing Module

- Other video input and/or output combinations availble as custom VPM options
- Consult OEM for user specific requirements

APPLICATIONS

Situational Awareness Display

- Overwatch and Alarm function to monitor area of interest
- Artificial Intelligence detection of Objects of Interest
- Fusion of Infra-red/Night Vision/ Optical Sensors

Battle Panel Display

- Joystick USB interface to control Pan and Tilt sensors
- Auto Tracker function to control Pan and Tilt sensors

Environmental

Temperature (Operational)	-20°C to +71°C
Temperature (Storage)	-40°C to +80°C
Vibration	MIL-STD810G ‘Operational Service’ as for Category 20 Ground Vehicles. MIL-STD810G ‘Transportation’ as for Category 6 Large Assembly Cargo.
Shock	MIL-STD810G ‘Procedure I – Functional Shock’ of 40g as for Ground Equipment.
Humidity	MIL-STD810G ‘Procedure I – Natural’ of 80%RH at 40°C.
Sand and Dust	MIL-STD810G ‘Dust (<150um) Procedure’ as for Ground Vehicles.
Electromagnetic Compatibility	MIL-STD-461F.
Altitude	MIL-STD810G ‘Procedure I – Storage/Air Transport’ up to 15 km (50,000 feet).
Input Voltage	28V DC MIL-STD-1275E
MTBF	15,000 hours @30°C GM

The VPM interfaces to the Intel ATOM® SBC through a high-bandwidth Gen 2 x4 PCIe bus, facilitating a direct interface through DMA, into the SBC’s Graphics processor.

Pre-processed video from the VPM can be combined with other video sources on the SBC, such as internally generated overlays or compressed video from the Gigabit Ethernet interfaces.

The integration of video detection and tracking functionality is available as an optional order item. Multiple object detection and tracking using a variety of algorithms are features that provide superior video auto tracking performance for various scenarios. In addition, the output of the video tracker can be used to provide rate demand data for pan and tilt control of a host system platform.

The **DS600** is offered as a smart Display Platform deployed with a standard firmware and software configuration that addresses typical applications. For custom requirements, bespoke configurations can also be provided after a requirements extraction session with the system integrator. Customization of software by the system integrator’s developers is also offered as an option.

Block Diagram