Introspect Technology Adds MIPI C-PHY and D-PHY Frame Grabber Solutions for CSI-2 Image Sensors

Based on the company's E Series modules, the SV4E-CPRXG and SV4E-DPRXG are necessary for validating vision and imaging systems based on MIPI CSI-2 video links

Montreal, Canada, March 4, 2020 — Introspect Technology, leading manufacturer of test and measurement tools for high-speed digital applications, today released two new frame grabber solutions for the validation and optimization of image sensors based on the MIPI® Alliance Camera Serial Interface 2 (CSI-2SM) standard and targeting the MIPI Alliance C-PHY SM and D-PHY SM physical layers. Because of their enhanced features, these image sensors are finding widespread use in non-consumer applications such as industrial, imaging, and machine vision, and this trend has resulted in the need for a new breed of frame grabber solutions supporting high-speed C-PHY and D-PHY physical layers. The highly flexible SV4E-CPRXG MIPI C-PHY Frame Grabber and SV4E-DPRXG MIPI D-PHY Frame Grabber modules enable rapid frame capturing and image processing on any host computer platform, and they support the latest MIPI Alliance specifications.

Beyond Selfies: How Frame Grabbers Help Develop High Performance CSI-2 Sensors

Image sensors have been used prolifically in many industrial, vision, and imaging applications, and this was traditionally achieved through the use of high-resolution optical sensing arrays that were coupled with wide-bandwidth digital transfer links. At the same time, consumer-grade sensors based on the MIPI CSI-2 specifications started to offer a rich set of features that made them especially attractive for other high-performance applications. For example, CSI-2 sensors now include high dynamic range support, brightness control, contrast control, variable frame rate, and many other features that have been made possible by the latest MIPI Alliance C-PHY and D-PHY physical layer standards. They are even used for sensing non-optical inputs such as radar signals.

The new breed of CSI-2 sensors now need to be tested and validated for real-life situations involving continuous (high frame rate) captures and continuously variable stimulus conditions – not just single-frame analysis. To address this, a frame grabber is needed that supports:

- Live streaming to a host computer
- Capturing large sequences of contiguous images from a single video stream
- Dynamically controlling the sensor parameters while continuously modifying input and environmental conditions

The above requirements can all be enabled using the SV4E-CPRXG MIPI C-PHY Frame Grabber for C-PHY based CSI-2 sensors and the SV4E-DPRXG MIPI D-PHY Frame Grabber for D-PHY based CSI-2 sensors. Each of these modules can be attached to any CSI-2 camera output or radar output, and it will automatically extract image data and provide for automated application development, calibration, and regression testing.

Features of the Introspect Technology C-PHY and D-PHY Frame Grabbers
Introspect Technology's C-PHY and D-PHY frame grabbers leverage many generations of hardware and software tools for MIPI, and they are optimized for the C-PHY and D-PHY physical layers, respectively. The following is a list of their main features:

- Any rate operation from 80 Msps to 3.5 Gsps (or 80 Mbps to 3.5 Gbps)
- Any CSI-2 lane configuration
- Support for all CSI-2 data types and pixel formats, including RAW16 and RAW20
- Automatic isolation of all CSI-2 virtual channels according to the latest revision of the CSI-2 specifications
- Integrated I2C master for controlling sensors under test
- Integrated I3C master for controlling sensors under test
- Support for contiguous frame capture at the maxim frame rate supported by the CSI-2 specifications
- Advanced exposure features including frame start and line start trigger I/O's
- Built-in frame rate monitors
- Built-in programmable power supplies for automating the turn-on and turn-off of sensors under test

With the deployment of MIPI CSI-2 based sensors into a wider range of applications, there is a strong need for flexible and robust frame grabber solutions that can handle the latest physical layer characteristics of these sensors. Introspect Technology's unique analog front-end technology for both C-PHY and D-PHY means that users can achieve high-confidence sensor validation without worrying about physical attachment issues.

Introspect Technology's SV4E-CPRXG MIPI C-PHY Frame Grabber and SV4E-DPRXG MIPI D-PHY Frame Grabber are both available for purchase now from Introspect Technology or through one of its approved worldwide distributors.

About Introspect Technology
Introspect Technology designs and manufactures innovative test and measurement tools for high-speed digital applications. Whether it is the next smartphone or the level-4 autonomy engine in a mobility solution, our instruments are used to help develop, test, and manufacture next-generation products. In other words, we help the leading semiconductor, automotive, and telecommunications companies make tomorrow's technology today's possibility.

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