

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 5, 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-PHYSM and D-PHYSM 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 maximum 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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