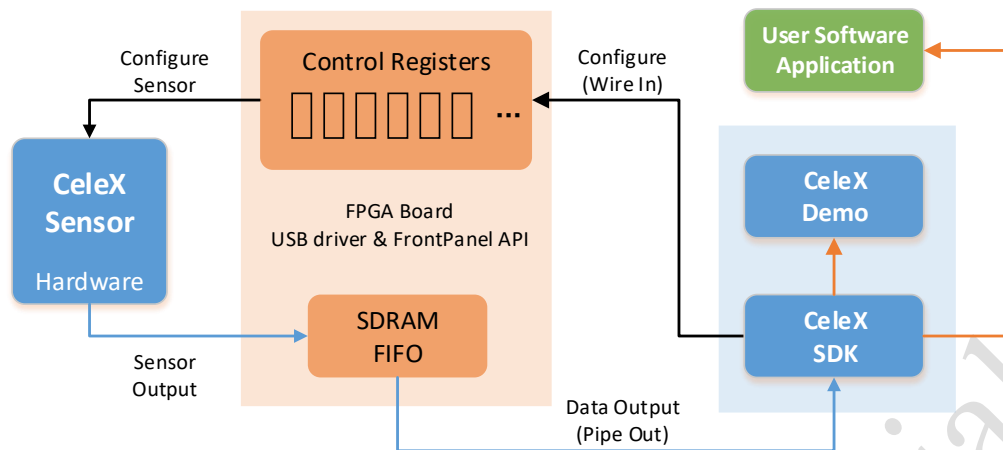# Brief Introduction of the CeleX^{TM} Sensor SDK
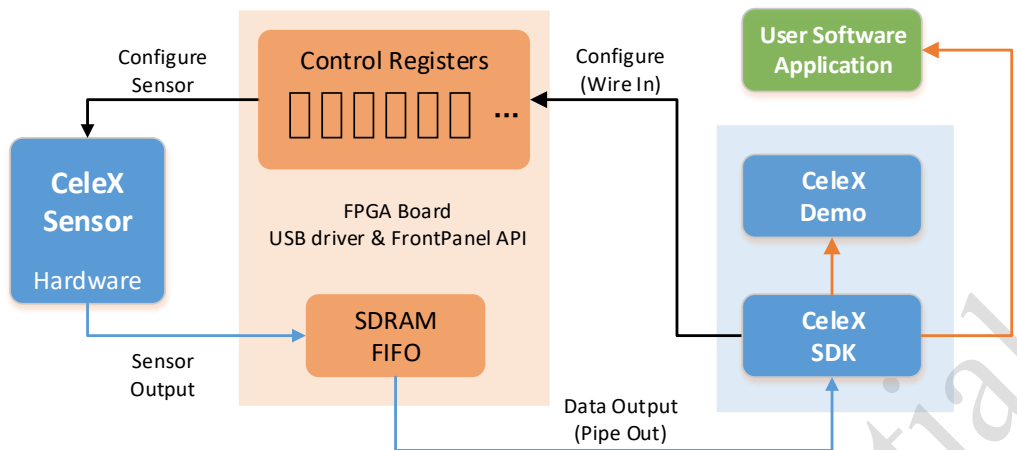

◆ CeleX^{TM} is a family of smart image sensor, specially designed for machine vision. Each pixel in CeleX^{TM} sensor can individually monitor the relative change in light intensity and report an event if a threshold is reached.

◆ The output of the sensor is not a frame, but a stream of asynchronous digital events. The speed of the sensor is not limited by any traditional concept such as exposure time and frame rate. It can detect fast motion which is traditionally captured by expensive, high speed cameras running at thousands of frames per second, but with drastic reduced amount of data.

◆ Our technology allows post-capture change of frame-rate for video playback. One can view the video at 10,000 frames per second to see high speed events or at normal rate of 25 frames per second.

◆ This SDK provides an easy-to-use software interface to get data from the sensor and communicate with the sensor, and it is consistent across the Windows (32-/64-bit) and Linux (32-/64-bit) development environments. In addition, it provides both pure C++ interfaces without any third libraries and OpenCV-based interfaces to obtain data from the sensor.

◆ This SDK provides three working modes of CeleX^{TM} Sensors: *Full-Picture* data, *Event* data, and *Optical-Flow* data. Full-Picture and Event data output alternately to create *FullPic-Event* data.

Brief Introduction of Release Directory

DemoGUI Documentation Drivers Samples Sources ReadMe.pdf ReleaseNotes.txt	◆ **DemoGUI**: CeleX Demo GUI execution (Windows and Linux). ◆ **Documentation**: **CeleX_SDK_Reference**: The introduction of CeleX^{TM} Sensor and the references of all the classes and functions in the SDK. **CeleX_SDK_Getting_Started_Guide**: The method to use the CeleX^{TM} Sensor Demo Kit, install Opal Kelly driver, run the CeleXDemo GUI and compile the source code. ◆ **Drivers**: OpalKelly FPGA Board driver (Windows / Linux / ARM). ◆ **Sources** **SDK**: CeleX library source code. **CeleXDemo**: CeleX demo source code (developed by Qt). **FPGA**: SE Project files, top level source code, Lower Layer FPGA module Declaration and Netlist file (ngc file). ◆ **Samples**: Several examples developed based on SDK and a sample user manual file. ◆ **ReadMe**: Brief Introduction of the CeleX^{TM} Sensor SDK. ◆ **ReleaseNotes**: New features, fixed bugs and SDK development environment.

CeleX™ Sensor SDK 简介

- CeleX™ 是针对机器视觉而设计的智能图像传感器系列。传感器中的每一像素点能够独立自主地监测相对光强的变化，并在到达阈值时被激发发出被读出信号。

- 传感器依据被激发的事件，输出连续的异步数据流，而不是图像帧。CeleX™ 传感器监测的运动物体速度不再受传统的曝光时间和帧速率限制。它可以侦测高达万帧/秒昂贵高速相机才能获取到的高速物体运动信息，而且还能大幅降低后端处理量。

- 可实现视频回放帧率的高速运动物体信息捕捉，回放帧率可以在 25~10000 帧/秒范围内进行选择。

- 本 SDK 提供了的所有接口都是跨平台且易于使用的，用户可以很方便的从 sensor 获取各种数据以及修改 sensor 工作模式，亮度和对比度等。并且，除了提供了纯 C++的获取 Sensor 数据的接口，还提供了基于 OpenCV Mat 的数据接口以方便开发者使用。

- 本 SDK 可提供三种类型的 CeleX™ 传感器数据：*Full-Picture* 数据，*Event* 数据以及 *Optical-Flow* 数据。Full-Picture 与 Event 数据交替输出组成：*FullPic-Event* 数据。

CeleX SDK Release 内容简介

DemoGUI Documentation Drivers Samples Sources ReadMe.pdf ReleaseNotes.txt	**DemoGUI**：CeleX Demo GUI 的可执行程序（Windows 和 Linux） **Documentation**： 　**CeleX_SDK_Reference**：本文档给出了 CeleX™ Sensor 的介绍以及本 SKD 的中所有的类和接口的说明 　**CeleX_SDK_Getting_Started_Guide**：本文档给出了如何使用 CeleX™ Sensor 开发套件，安装 Opal Kelly 驱动，运行 CeleXDemo GUI 以及编译 SDK 的源代码 **Drivers**：OpalKelly FPGA 处理板驱动（Windows / Linux / ARM） **Sources**： 　**SDK**：CeleX SDK 源码 　**CeleXDemo**：CeleX Demo 源码（用 Qt 开发） 　**FPGA**：SE 工程文件，top level 源码，Lower Layer FPGA 模块说明以及 Netlist 文件（ngc 文件） **Samples**：基于 SDK 开发的几个示例以及一份示例说明文档 **ReadMe**：CeleX™ Sensor SDK 的简介 **ReleaseNotes**：本次发布新增的功能，修复的 bug 以及开发环境介绍