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CAST

CAST Ships I2C/SPI Controller IP Core for Easier Serial Communication

Delivers the flexible, multiple-peripherals simplicity of I2C and the faster, lower-latency communication of SPI in a single, efficient, easier-to-use IP core

Woodcliff Lake, New Jersey — **September 5, 2024**—Semiconductor intellectual property provider CAST today announced a new serial interface IP core that supports two of the most popular communication protocols: I2C (Inter-Integrated Circuit) and SPI (Serial Peripheral Interface).

The new **I2CSPI-CTRL** I2C and SPI Controller/Target Controller implements the features of the de facto I2C standard and also conforms to the Philips SPI standard, all in a compact and versatile hardware controller ready for FPGAs or ASICs. Run-time protocol selection makes it straightforward for developers to integrate the most effective communication between modules within a system and with peripherals outside of the system. Since many systems use both I2C and SPI interfaces but rarely concurrently, using this one core rather than two simplifies integration and can save significant silicon resources.

For I2C, the core offers half-duplex operation in controller (master) or target (slave) mode, works with single- or multiple-controller buses, and offers clock stretching to transmit data at up to 100 kbit/s in Standard Mode or 400 kbit/s in Fast Mode, all over a synchronous two-wire interface. I2C is scalable and very flexible, making it relatively easy, for example, to add multiple addressable sensors and actuators to Internet of Things (IoT) or drone systems where minimum silicon area and power consumption are critical.

The SPI controller supports full-duplex communication at speeds up to 10 MB/s, operating as either a controller or a target on a single-controller bus with a four-wire connection. While SPI is less flexible than I2C, it offers faster, lower-latency communication, making it the preferred choice for scenarios where speed is critical, such as in automotive systems or flash memory controllers.

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“This new IP core lets system developers easily switch between I2C and SPI as needed without building in a separate core for each interface,” said Evan Price, sales engineer for CAST. “While I2C and SPI are well-established technologies, combining them in a single core is an advance with significant resource and time savings. This reflects CAST's commitment to providing practical, dependable IP solutions that streamline development and empower our customers to build standout products.”

The silicon-proven I2CSPI-CTRL core is sourced from Fraunhofer IPMS and is shipping now in RTL for ASICs or as a netlist optimized for FPGAs. Learn more and download a product brief on the core’s web page, or contact CAST at info@cast-inc.com to discuss how the new controller might address the communication challenges in your system while reducing integration effort and saving silicon resources.

About CAST

Computer Aided Software Technologies, Inc. (CAST) is a silicon IP provider founded in 1993. The company’s ASIC and FPGA IP product line includes microcontrollers and processors; compression engines for data, images, and video; interfaces for automotive, aerospace, and other applications; various common peripheral devices; and comprehensive SoC security modules. Learn more by visiting www.cast-inc.com.

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