HART Communication Made Easy

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HART (highway addressable remote transducer) is the global standard for sending and receiving digital information across analog wires between smart field devices and control or monitoring systems, like PLC and DCS systems. Bidirectional HART communication provides access to additional information between the field and the host controller, which can range from a handheld device to a plant controller or asset management system. Fortunately, this bidirectional, digital information utilizes the existing 4 mA to 20 mA network, making it easy to deploy on existing infrastructure (see Figure 1).

The key to a successful HART implementation is the ability to accurately encode and decode HART communication signals in noisy, harsh industrial environments and the attainment of registration for that system with the HART Communication Foundation. ADI has developed a fully functional HART enabled smart transmitter reference demo using the AD5421, a 16-bit, loop powered, 4 mA to 20 mA DAC, and the AD5700 HART, FSK modem. This circuit (see Figure 2) has been compliance tested, verified, and registered as an approved HART solution by the HART Communication Foundation. This registration confirms that the ADI solution, consisting of the AD5421 and the AD5700 complies with the HART physical layer protocol and, hence, is a proven and verified solution. ADI's industrial converter portfolio also includes the AD5422 family, the industry's benchmark solution, which is ideal for 4-wire transmitter applications, while the new AD5755, a 16-bit, quad DAC with innovative dynamic power control technology, is for multichannel I/O applications.

These industrial DAC families and the AD5700 HART modem have been specifically engineered to address the challenges of incorporating HART onto 4 mA to 20 mA communication. They feature a single pin for easy coupling of the HART signal into the converter, superimposing the HART pulses onto the preprogrammed 4 mA to 20 mA output. The combination of ADI's HART enabled 4 mA to 20 mA DACs with the new AD5700 HART modem greatly simplifies the design of HART enabled systems, enhancing reliability, while reducing overall PCB size and cost. ADI provides the complete signal chain for a HART enabled 4 mA to 20 mA loop with components designed to mate seamlessly together. By selecting the AD5700 and a complementary ADI industrial converter for your application, be it a field instrument or an I/O card, you can be assured that your solution will adhere to the HART protocol.

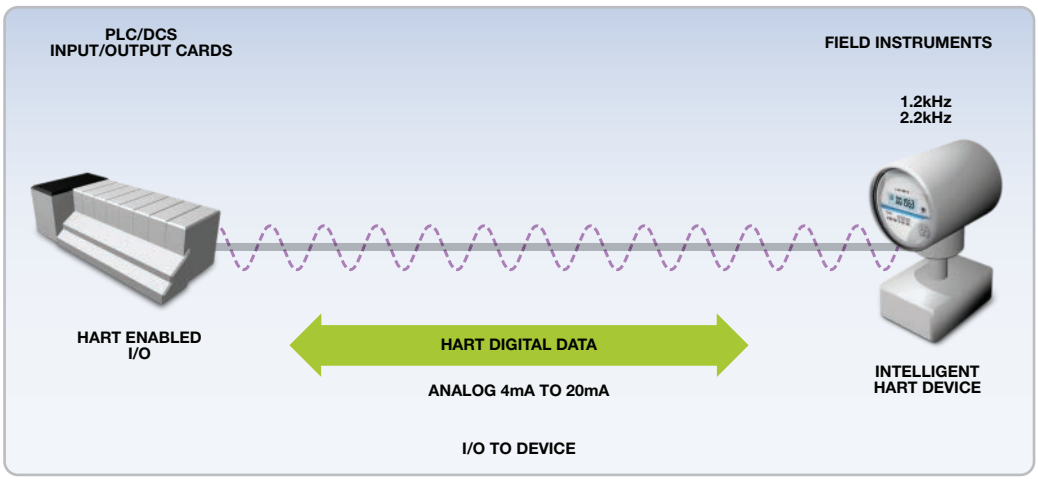

Figure 1. Two communication channels.

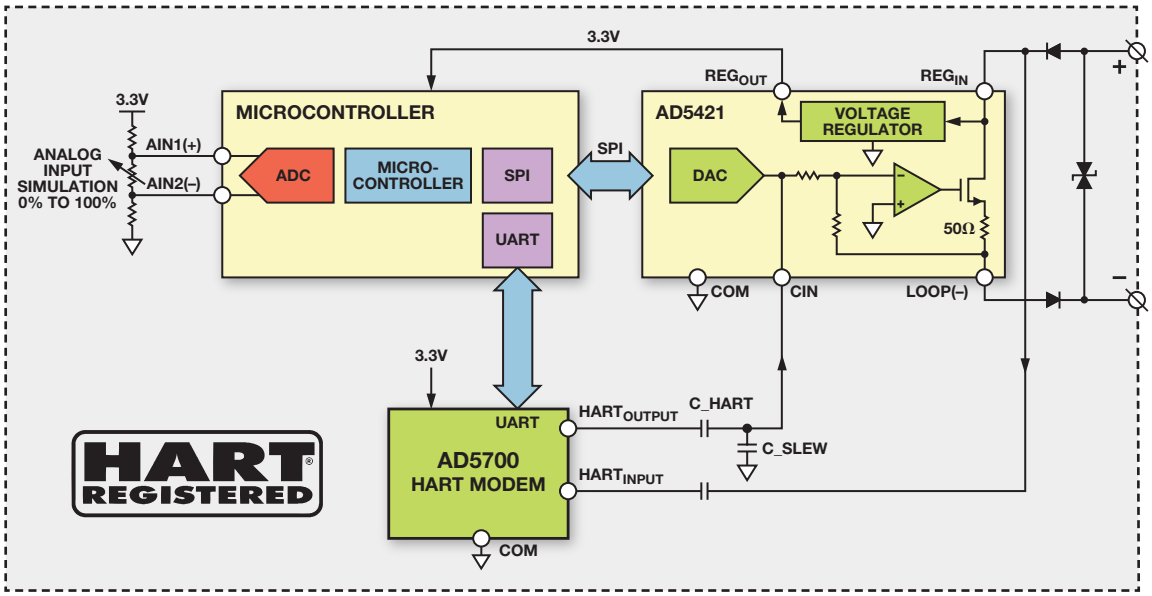

Figure 2. Smart transmitter demo.

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