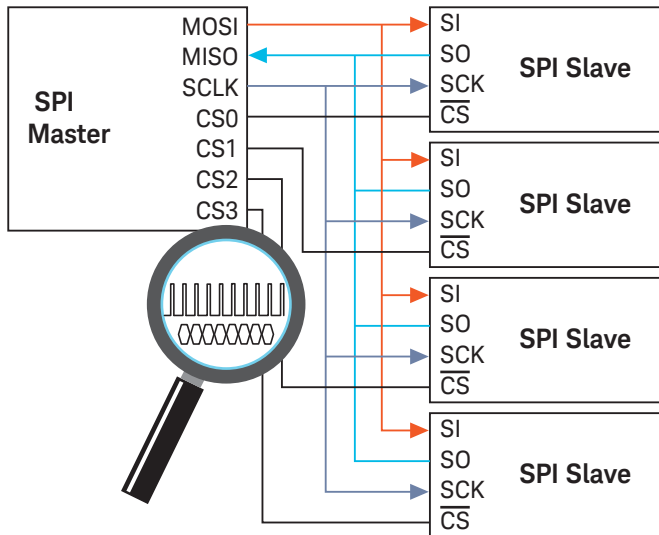


Application Brief

Bus multi-channel real-time decoding

Using M3100A PXIe Digitizer module with programmable FPGA option and M3602A software to implement a SPI decoder

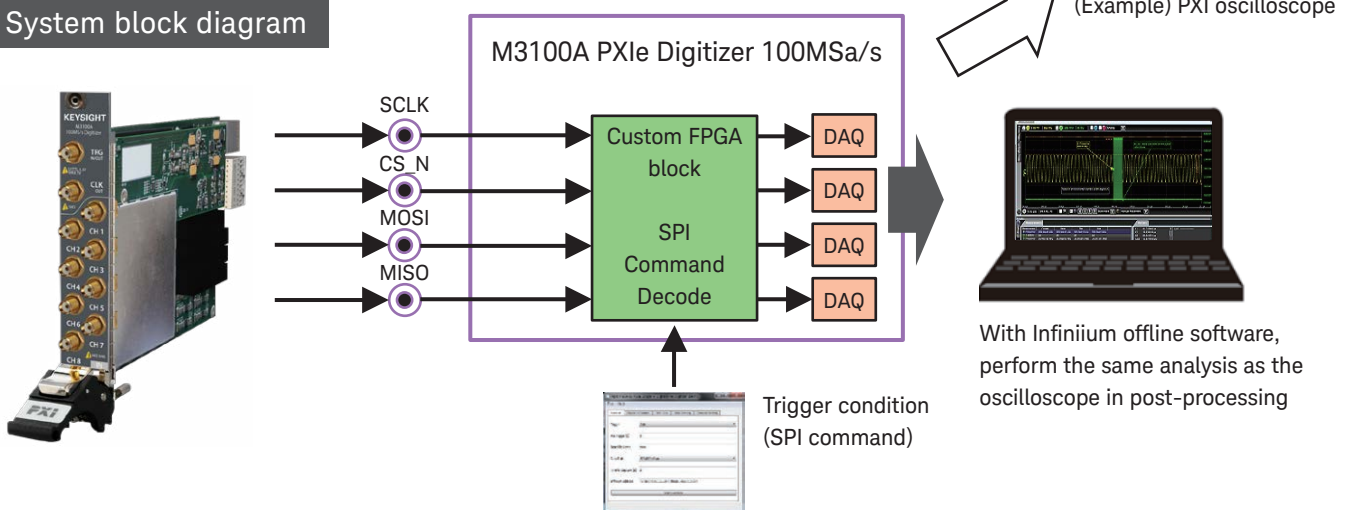


SPI, CAN, etc. are widely used for communication between in-vehicle ECUs and peripheral devices, and debugging them requires waveform observation with an oscilloscope. Oscilloscopes, however, have dead time, and are unable to analyze all communication packets and trigger data completely.

An FPGA-based signal processing, allows real-time analysis of all signals coming through multiple channels, and ensures triggering every time a specific command arrives. It supplements long-time waveform to SSD regardless of memory limitation.

The data are converted to enable observation. This improves resolution for subsequent analysis on a PC.

System block diagram



FPGA development Services

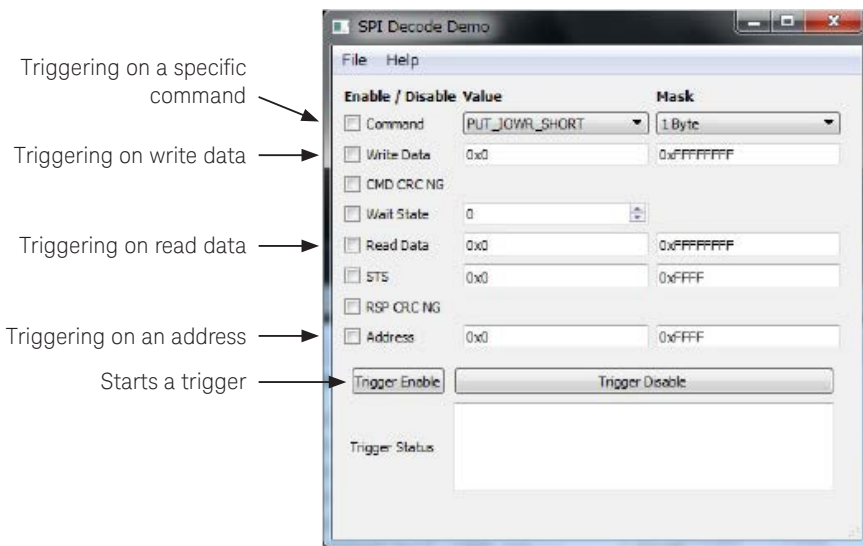
Keysight Technologies not only sells hardware and software products, but may also provide services according to customers' requests for hardware implementation, software and application development.*

Consulting Services *

1. Sample codes
2. Turnkey software (project) contracts
3. IP development and delivery

* Consulting Services may be provided by means of an integration partner. Consult with your Account Manager the options that are available in your region.

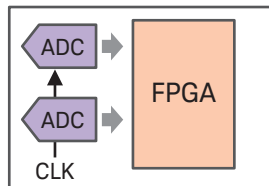
Example Software



Example software (included source code) is available on request

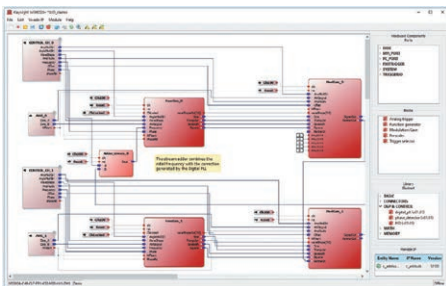
- Set up various commands on the SPI bus and monitor a 4 -channel bus in real time (can be easily extended to 8 channels or more)
- Ensure supplementation every time a command arrives and capture signals for all four channels until the specified length is achieved.
- Convert to the format directly read by the oscilloscope's offline analysis software
- Automatically displays on the offline analysis software

M3100A PXIe Digitizer



- 100 MSa/s 14 bit digitizer 4 channels or 8 channels
- Easy channel expansion through synchronization with multiple modules with optional HVI technology which allows automatic synchronic coherent operation across multiple modules or chassis
- User programmable built-in FPGA (Xilinx Kintex 7)
- Link triggers with other PXIe oscilloscopes etc. allows further expansion of analysis.

M3602A FPGA Design Environment software



The user-customized area and the measurement area are clearly separated, allowing you to focus solely on the custom processing of AWG generation and Digitizer acquisition signals without having to implement the control of measurement.

- The user-friendly graphical environment simplifies the development of custom DSP for the FPGA device enabling special modes of operation or new control structures.
- Easily import FPGA codes and external IP
 - VHDL, Verilog, and VIVADO/ISE projects, MATLAB/SIMULINK, Xilinx IP core
- Fast one-click compilation
- Reduced development time and compiling time together with hot programming enable dynamically-reconfigurable instruments.

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