Requested Changes to the IEEE 1451.2 Standard for Smart Transducers

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Most requested changes to IEEE 1451.2

- Make it easier to understand and implement
- Make the hardware interface faster
- Use less wires
- Pick a standard connector
- Provide for electrical isolation
- Allow real-time reconfiguration
- Add frequency response to TEDS and correction engine
- Make NCAPs readily available and compatible with existing systems
- Don’t add unnecessary expense to simple transducers
- Add security, timestamps, data logging, etc.

Most requested changes, con't.

- Make it easier to understand and implement
  - New, broad-reaching standard
  - Wide adoption will produce user guides, books, etc.
  - Not everyone must understand the details
  - OEMs can convert raw transducers to STIMs without having to design signal conditioning and conversion
- Make the hardware interface faster
  - Minimum of 6,000 bit/s supports inexpensive hardware
  - Maximum not specified; several million bit/s has been demonstrated
  - Digital interface may not be appropriate for all applications (*e.g.* IEEE P1451.4)

Most requested changes, con't.

- Use less wires
  - Originally for single close-coupled transducer to microprocessor
  - Based on SPI with hardware handshaking
  - Supports synchronized trigger and data acquisition
  - Simpler interfaces are appropriate for some uses
- Pick a standard connector
  - Connectors are very application-dependent
  - Started defining connectors for some applications
  - Alternate physical layers may include connectors
  - True "plug-and-play" requires connector definition

Most requested changes, con't.

- Provide for electrical isolation
  - Isolation less of an issue for close-coupled system
  - Using existing standard physical layers will help
- Allow real-time reconfiguration
  - STIM cannot tell NCAP that the TEDS has changed
  - No standard mechanism for selectable gain, sample rate, number of samples, etc.
- Add frequency response to TEDS and correction engine
  - Standard provides for extensions to TEDS but not to correction engine

Most requested changes, con't.

- Make NCAPs readily available and compatible with existing systems
  - Standard visualizes complete system including STIMs, NCAPs, network-level software
  - Need growth path to bring benefits of IEEE 1451 to existing systems
- Don't add unnecessary expense to simple transducers
  - Target is applications where interchangeable communicating smart transducers add value
  - Some applications are too cost-sensitive
  - Line between the two will shift over time

Most requested changes, con't.

- Add security, timestamps, data logging, etc.
  - Originally viewed as higher-level functions
  - Appropriate to consider for proposed enhancements
  - Will depend on the interests of the people who participate in the working group
  - Must avoid "rampant featuritis!"