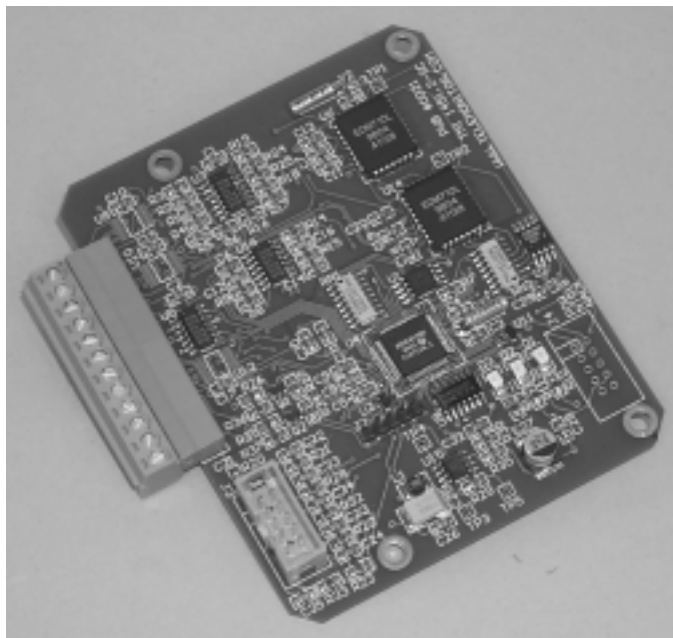


The TMI 1451.2-SC Prototyping STIM (Smart Transducer Interface Module) provides a quick way to build IEEE 1451.2 compliant products. The STIM has nine channels: an on-board temperature sensor, two fully conditioned analog input channels, two buffered analog input channels, two filtered and buffered analog output channels, and two digital output channels. The two fully conditioned input channels can be used in differential or single-ended mode, or all signal conditioning can be turned off for all channels. Mode selection is by supplied configuration software and can be performed over the network.



Highlights

- **“Quick-Start” solution for IEEE 1451.2 products.**
- **Nine channels including analog inputs, analog outputs, digital outputs, and temperature.**
- **Full analog signal conditioning, including programmable gain and anti-aliasing filters.**
- **Compatible with Agilent Technologies Embedded Ethernet Controllers.**

The EDM 710 signal conditioning application-specific integrated circuit (ASIC) used on channels 2 and 3 comprises a differential-input instrumentation amplifier, reference adjustment digital-to-analog converter (offset adjustment DAC), programmable gain amplifier, programmable frequency response anti-aliasing filter, temperature sensor, and digital interface. The programmable features of the ASIC can be set through the IEEE 1451.2 interface and are stored in non-volatile memory.

The STIM will work with any IEEE 1451.2 Network Capable Application Processor (NCAP), but is especially designed for use with the Agilent Technologies 66501 or 66502 Embedded Ethernet Controllers. Additional information about these products is available at <http://www.hp.ie.com>.

Specifications

Electrical

| | |
|--|----------------|
| Supply voltage..... | 4.75 to 5.25 V |
| Operating current (not including transducer excitation)..... | 45 mA |
| Transducer excitation voltage | 4.1V |
| Transducer excitation current..... | 30 mA maximum |

Performance

| | |
|--|-----------------------------|
| Temperature sensor range (CH1)..... | -40 to +85° C |
| Temperature sensor resolution (CH1) | 0.5° C |
| Analog input range (CH2 and CH3 mode 1, programmable) | ±75 µV to ±750 mV |
| Analog input common mode range (CH2 and CH3 mode 1, ±10 mV signal) | 1 to 4 V |
| Analog input amplifier gain (CH2 and CH3 mode 1, programmable) | 6 to 77 dB |
| Analog input range (CH2-CH5 mode 2) | 0 to 4.1 V |
| Hardware input anti-aliasing filter cutoff (CH2 and CH3, -3 dB, programmable)..... | 16 to 1024 Hz |
| Hardware input anti-aliasing filter roll-off (CH2 and CH3) | -24 dB/octave |
| Oversampling rate (programmable)..... | 2 to 16 times filter cutoff |
| Sample rate (programmable) | 32 to 2048 Sa/s |
| ADC resolution (CH2-CH5) | 12 bits |
| Analog output range (CH6 and CH7) | 0 to 4.1V |
| DAC resolution (CH6 and CH7)..... | 12 bits |
| Analog output filter cutoff (CH6 and CH7, -3 dB, fixed) | 400 Hz |
| Analog output filter roll-off (CH6 and CH7)..... | -12 dB/octave |
| Digital output type (CH8 and CH9) | open-collector |
| Digital output rating (CH8 and CH9, with 10k pull-up resistor) | 36 V maximum |
| TEDS memory | 32 Kbytes |

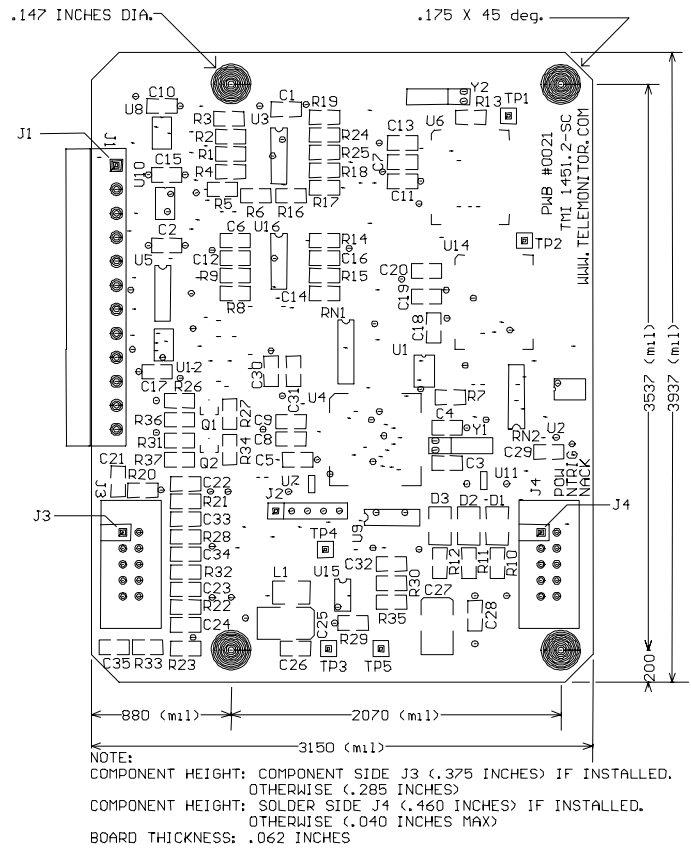
Mechanical Configuration

Operating Modes:

- Mode 1:** Channels 2 and 3 are differential inputs through the signal conditioning ASIC. Can be selected for each channel independently.
- Mode 2:** Channels 2 and 3 are single-ended inputs through the signal conditioning ASIC. Can be selected for each channel independently.
- Mode 3:** All analog input and output signal conditioning is turned off. None of the channels are filtered. Applies to all channels if selected.

Notes on IEEE 1451.2 Connectors

- J3 and J4 are the IEEE 1451.2 Transducer Independent Interface (TII). See IEEE 1451.2 for assignments and use of these pins.
- J3 is a ribbon-cable connector compatible with the Agilent Technologies 66501 or 66502 NCAPs.
- J4 is a stacking connector that can be installed on the opposite side of the board. A connector and standoffs for the 66502 NCAP are included with the STIM (must be installed if needed). A connector for the 66501 is available by special order.



J1 Pin Assignments (Mode Dependant)

| Pin Number | Mode 1 | Mode 2 | Mode 3 |
|------------|-----------|-----------|-----------|
| 1 | CH2 IN+ | N/C | CH2 VIN+ |
| 2 | CH2 IN- | CH2 VIN+ | N/C |
| 3 | CH3 IN+ | N/C | CH3 VIN+ |
| 4 | CH3 IN- | CH3 VIN+ | N/C |
| 5 | CH4 VIN+ | CH4 VIN+ | CH4 VIN+ |
| 6 | CH5 VIN+ | CH5 VIN+ | CH5 VIN+ |
| 7 | CH6 VOUT+ | CH6 VOUT+ | CH6 VOUT+ |
| 8 | CH7 VOUT+ | CH7 VOUT+ | CH7 VOUT+ |
| 9 | CH8 DOUT | CH8 DOUT | CH8 DOUT |
| 10 | CH9 DOUT | CH9 DOUT | CH9 DOUT |
| 11 | +4.1 V | +4.1 V | +4.1 V |
| 12 | COM | COM | COM |

Notes on Pin Assignments

- VIN and VOUT (single-ended inputs and outputs) are referenced to pin 12 (COM).
- Pin 11 (4.1 V) is intended for transducer excitation and is limited to 30 mA maximum.