

The TMI 1451.2-SA Smart Transducer Module provides a quick way for manufacturers to build Smart Transducer Interface Modules (STIMs) based on the IEEE 1451.2 standard for connecting transducers to microprocessors. IEEE 1451.2 defines a Transducer Electronic Data Sheet (TEDS), as well as the digital interface for accessing that data sheet, reading sensors, and setting actuators. It provides transducer manufacturers and system integrators a network-independent way to build network-capable smart transducers.

The TMI 1451.2-SA has one analog input (sensor) and one analog output (actuator) channel.

The physical arrangement of the TMI 1451.2-SA has been referred to as a "STIM in a connector" because the signal conditioning and logic electronics are contained in the housing for the IEEE 1451.2 interface connector. By attaching the transducer to the other end of a fixed cable, the TMI 1451.2-SA fully meets both the requirement and the intent of IEEE 1451.2 to keep the TEDS positively associated with the transducer.



Highlights

- Complete "Quick-Start" solution for building IEEE 1451.2 Smart Transducers.
- Full analog signal conditioning, including anti-aliasing filter.
- Attaches directly to strain gage and other resistive bridge transducers.
- Meets IEEE 1451.2 requirement to keep TEDS attached to transducer.

The TMI 1451.2-SA interface module uses TMI CogniSense technology to provide the analog signal conditioning, anti-aliasing filter, data conversion, and digital communications interface. It connects directly to resistive bridge or voltage-output sensors. The user has only to provide the transducer and the data for the TEDS to produce a complete IEEE 1451.2 STIM.

The TMI CogniSense signal conditioning application-specific integrated circuit (ASIC) 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. A 12-bit analog-to-digital converter (ADC) is used as a signal converter.



A STIM requires a Network Capable Application Processor (NCAP) to provide the interface to the network of choice. The TMI 1451.2-NA RS-485 Network Node provides the functions of an NCAP, and includes an RS-232 serial interface and software to permit using a personal computer to load and view TEDS, or set and monitor transducers. Up to 255 TMI 1451.2-NA nodes can be daisy-chained on a single RS-485 network. The TMI 1451.2-SA also works with the HP BFOOT-66501 Ethernet NCAP.

Also available is the TMI 1451.2-KA kit which contains one TMI 1451.2-NA node and two TMI 1451.2-SA interface modules, one of which has been built into a fully functional accelerometer STIM. The second interface module is included so that manufacturers may build experimental IEEE 1451.2 STIMs using their own transducers.

Specifications

Mechanical

Connector body size (see drawing) 2.7 x 1.2 x 0.8 in.
 Standard transducer cable wire size..... 24 AWG
 Standard cable length..... 40 in.
 Interface connector type (see notes)..... male 15 pin Subminiature-D, shell size 1

Electrical

Supply voltage 4.5 to 5.5 V
 Operating current (not including transducer excitation) 30 mA
 Transducer excitation voltage 4.1V
 Transducer excitation current..... 45 mA maximum

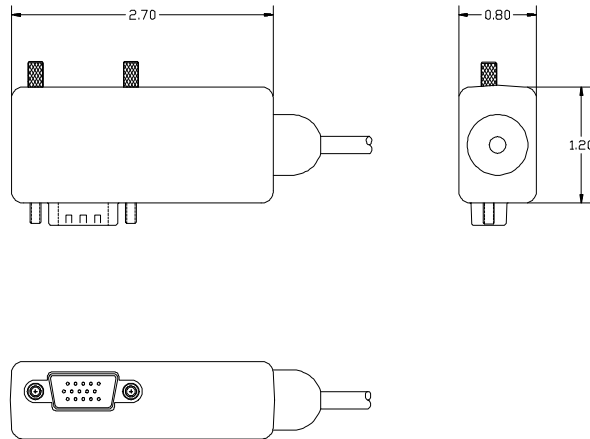
Performance

Analog input range (differential signal) ±750 mV
 Analog input common mode range (±10 mV signal) 1 to 4 V
 Instrumentation amplifier gain (programmable) 6 to 77 dB
 Hardware anti-aliasing filter cutoff (-3 dB, programmable) 16 to 1024 Hz
 Hardware filter roll-off..... -24 dB/octave
 Oversampling rate (programmable)..... 2 to 16 times filter cutoff
 Sample rate..... 32 to 2048 Sa/s
 ADC resolution..... 12 bits
 Analog output range 0 to 4.1V
 DAC resolution..... 12 bits
 Analog output filter cutoff (-3 dB, fixed)..... 400 Hz

See the EDM 710 data sheet for more information about the analog input ASIC.

Transducer Cable Wires and Housing Dimensions

Signal name	Wire color
Excitation (+4.1 V)	Red
Excitation common	Black
In +	White
In -	Green
External Input	Blue
External Output	Brown
Shield Drain	Bare



Notes on Interface Connector Pin Assignments

1. Pins 1-10 of the 15-pin interface connector are the IEEE 1451.2 Transducer Independent Interface (TII). See IEEE 1451.2 or the TMI 1451.2-NA data sheet for assignments and use of these pins.
2. Pins 11-13 are not connected internally and may be connected to ground if desired.
3. Pin 14 is a factory test point and should either be connected to ground or not connected.
4. Pin 15 is for factory use (programming control) and must not be connected.