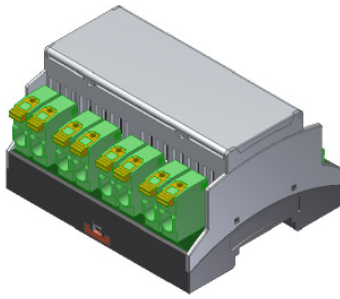


# IsoBlock V

Galvanically Isolated Differential Voltage Sensor



## OVERVIEW

The IsoBlock V module has been designed to provide high-quality isolated differential voltage measurements for applications requiring scaling of high voltages, as well as superior isolation. Each IsoBlock V unit hosts four separate isolated channels, each of which can be connected to separate measurement sources while providing a range of functional coverage up to 1500V. The input of each specific IsoBlock channel has its own isolated reference, and can be configured to suit user needs. All processed signals output from the IsoBlock unit are referenced in respect to the ground channel of the user's data acquisition system. Verivolt designs its IsoBlock V modules with consideration for user great flexibility, high channel-density and low power consumption.

## SPECIFICATION

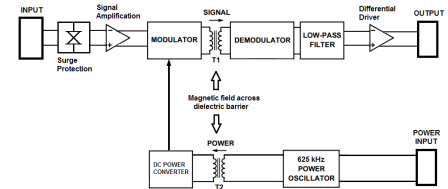
| IsoBlock V   | 50V                            | 100V   | 200V   | 300V   | 500V   | 750V   | 1000V   | 1500V  |
|--|--------------------------------|--------|--------|--------|--------|--------|---------|--------|
| <b>Bandwidth (-3dB point)</b>                        | 100kHz (120kHz to 1MHz custom) |        |        |        |        |        |         |        |
| <b>Integrated sensor noise (Referenced to input)</b> | < 1 mV                         | < 1 mV | < 1 mV | < 2 mV | < 3 mV | < 6 mV | < 10 mV | < 14mV |
| <b>Gain (Using 10V standard output voltage)</b>      | 5                              | 10     | 20     | 30     | 50     | 75     | 100     | 150    |
| <b>Differential input dynamic range</b>              | 50V                            | 100V   | 200 V  | 300 V  | 500 V  | 7500 V | 1000 V  | 1500 V |
| <b>Channels per module</b>                           | 4                              |        |        |        |        |        |         |        |

## HARDWARE DESCRIPTION

The IsoBlock V module is designed to isolate and scale down high voltages found in industrial environments. The end result is a signal ready to connect to any data acquisition system, while galvanically isolating the source from it. Each channel of the IsoBlock module has a galvanic isolation from the input to the output that can eliminate large common mode voltages. In addition to that, each channel also has a protection stage at the input that guards it from surges. Following the input surge protection stage, there is an amplification stage that brings the input signal to a  $\pm 10V$  range. This signal is modulated into a magnetic field, and then transferred across a galvanic barrier. A demodulating stage recovers the original signal, followed by an anti-aliasing filter and a conditioning stage to output a  $\pm 10V$  differential pair. The figure below shows a block diagram of the process described above.

| Electrical  |                                      |
|---|--------------------------------------|
| Accuracy (percentage of reading)  | $\pm 0.2\%$<br>( $\pm 0.1\%$ custom) |
| Max total phase shift at 60Hz   | < 0.05°                              |
| Max Input delay (100kHz versions)                                       | < 2.8 $\mu$ s                        |
| Isolation voltage from primary side to secondary side                   | > $\pm 1500$ V                       |
| Withstanding common mode surge voltage                                  | $\pm 5000$ V                         |
| Withstanding differential mode surge voltage                            | $\pm 2500$ V                         |
| Mechanical  |                                      |
| Mounting Type   | DIN Rail                             |
| Connectivity (Connector for power in and signal out to/from the sensor) | Spring Cage connector                |
| Outer Dimensions  | 3.9" x 3.5" x 2.5"                   |
| Channels  | 1 and 4 channels                     |
| Weight  | 198 g (7.0 oz)                       |

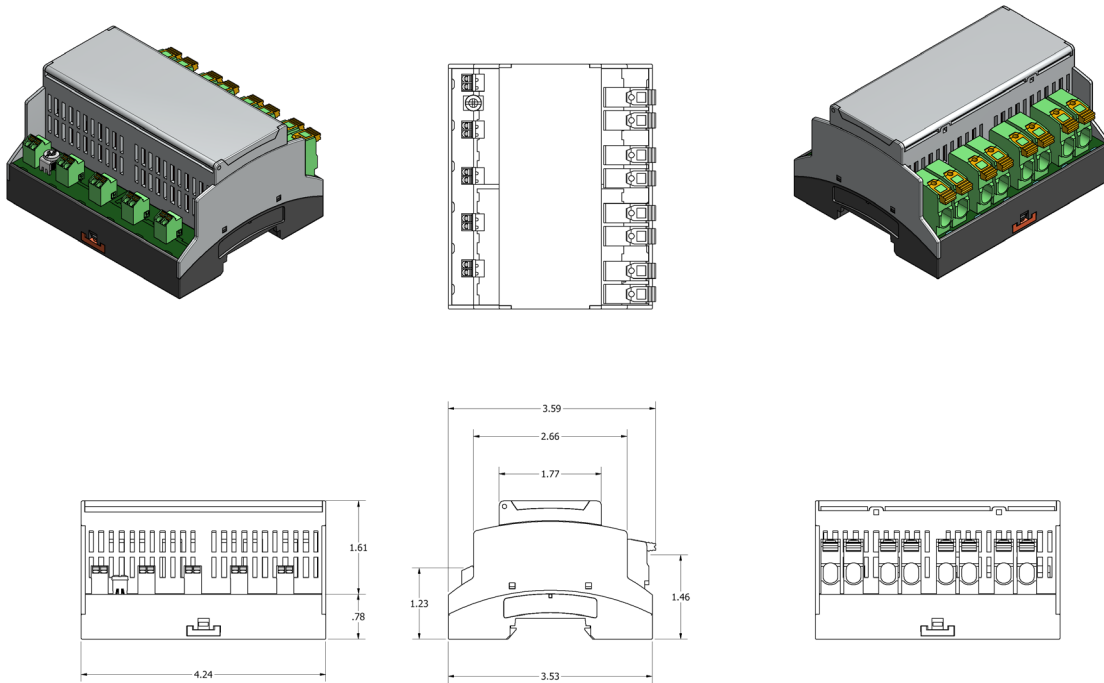
| Performance                                     |   |
|---|---|
| Input-Output non-linearity                      | < $\pm 0.1\%$   |
| Integrated channel noise (Referenced to output) | < 1.2 mV  |
| Output voltage                                  | $\pm 10$ V  |
| Gain temperature drift                          | $\pm 50$ ppm/°C   |
| Common mode rejection at 60Hz                   | 112 dB  |
| Power Supply Voltage                            | 9V to 28 V  |
| Output type                                     | Differential pair   |
| Output Offset Voltage (Referenced to output)    | $2\sigma$ < $\pm 500$ $\mu$ V (typical)<br>$4\sigma$ < $\pm 1$ mV (limit) |
| Differential Input impedance                    | > 10 M $\Omega$   |
| Insulation impedance                            | > 10 G $\Omega$    2pF  |
| Output impedance                                | 100 $\Omega$  |
| Environmental                                   |   |
| Operating temperature                           | - 25 to 70 °C   |
| Storage temperature                             | - 40 to 80 °C   |



IsoBlock V single channel block diagram.

- The isolation barrier of every device is tested with a 5 second partial discharge of 1800V for 5 seconds, with a detection threshold of 150pC.
- Withstanding common mode surge voltage is 2 seconds half sinewave.
- Withstanding differential mode surge voltage is 4 seconds half sinewave.

# MERCHICAL DIMENSIONS

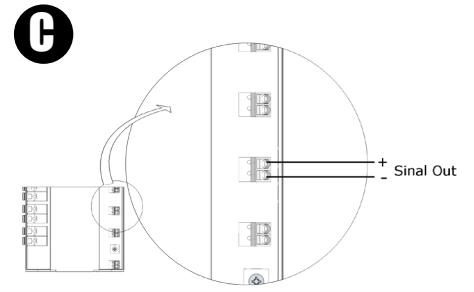
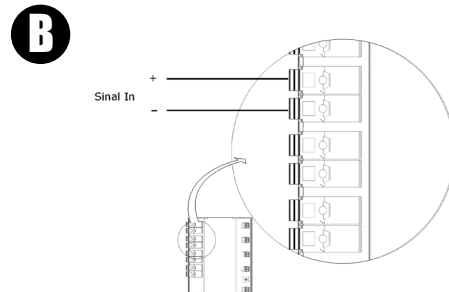
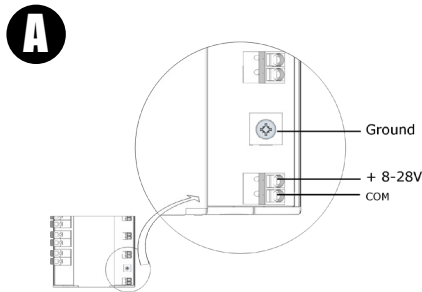


# HARDWARE CONFIGURATION

A. Connect external power source to power the unit. For proper functioning the power supply should provide a voltage between V and 28V with at least 0.25A of continuous current and 0.5A surge during module start-up.

B. Securely connect wire in the 20-6 AWG range between the source of measurement and an available IsoBlock's input screw terminal.

C. Securely connect one end of a twisted pair to the output terminals, and the other end to the inputs of your data acquisition unit



## Standards and Certifications

- CE



## **⚠ DANGER**

THIS SENSOR IS NOT A SAFETY DEVICE AND IS NOT INTENDED TO BE USED AS A SAFETY DEVICE. This sensor is designed only to detect and read certain data in an electronic manner and perform no use apart from that, specifically no safety-related use. This sensor product does not include self-checking redundant circuitry, and the failure of this sensor product could cause either an energized or de-energized output condition, which could result in death, serious bodily injury, or property damage.