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HIUSB   *HART Interface for protocol USB*

Description

The Computer Modem HIUSB is a complete communication path for a HART network. It will enable personal computers to read and or configure data within HART devices. The computer USB connector provides operating energy for the modem, eliminating the need for extra power supply, while the HART loop connector is electrically isolated from the computer terminals. These are key features for process control network. The HIUSB is able to work with most configuration software in the market, being a reliable and cost effective option.

Features

- Ideal for configurations, data acquisition and digital control.

- Factory tested to work with all HART field devices.

- Extremely low leakage current (< 1 uAdc) will not interfere with current loop.

- Compatible with USB type A connector or type B with adaptor cable.

- Galvanic isolation between HART and USB port greater than 500V.

- Small size and light weight enclosure, no need for extra power supply.

The purpose of this document is assist with the setup, installation, operation and maintenance of the HIUSB as well as providing technical specifications and basic data, for further information about this product can be found at www.springres.com

Table of Contents

1   General Information

Process control applications impose strong concerns over any access into the signal line. Quite common to have the field device far from the control room, raising serious concerns about ground loops and static electricity, while the signal wires are transmitting the analog current representing the process variable anything connected to it must not disturb such signal. The computer interface must consider these necessities therefore must be built with best quality components and also observing all guidelines for ground loop isolation, energy injection, and current leakages.

At the computer side these interfaces must satisfy applicable standard computer communication such as RS232, USB, BlueTooth, Ethernet, and many others. At the process control network these interfaces must satisfy the requirements of HART protocol.

The HIUSB interface combine requirements of HART and USB protocols, and also consider general guidelines of intrinsic safety for hazardous areas. The HART connector is galvanically isolated from the computer connections making it safe for process control application.

2   Mounting & Electrical

The HIUSB require no special need for mounting it can be left hanging on the computer cable, or over any desk within an environment fitted for computer operation. Figure 7.1.1 suggest electrical connection to computer and HART network.

The HART and USB wires are galvanically isolated from each other this way the computer and process control equipments can be grounded according to their own requirements. The HIUSB will tap into signals from these 2 ground systems without concerns.

3   Electric Wiring

Figure 7.1.1 and the table below describe the electrical designators of the HIUSB terminals.

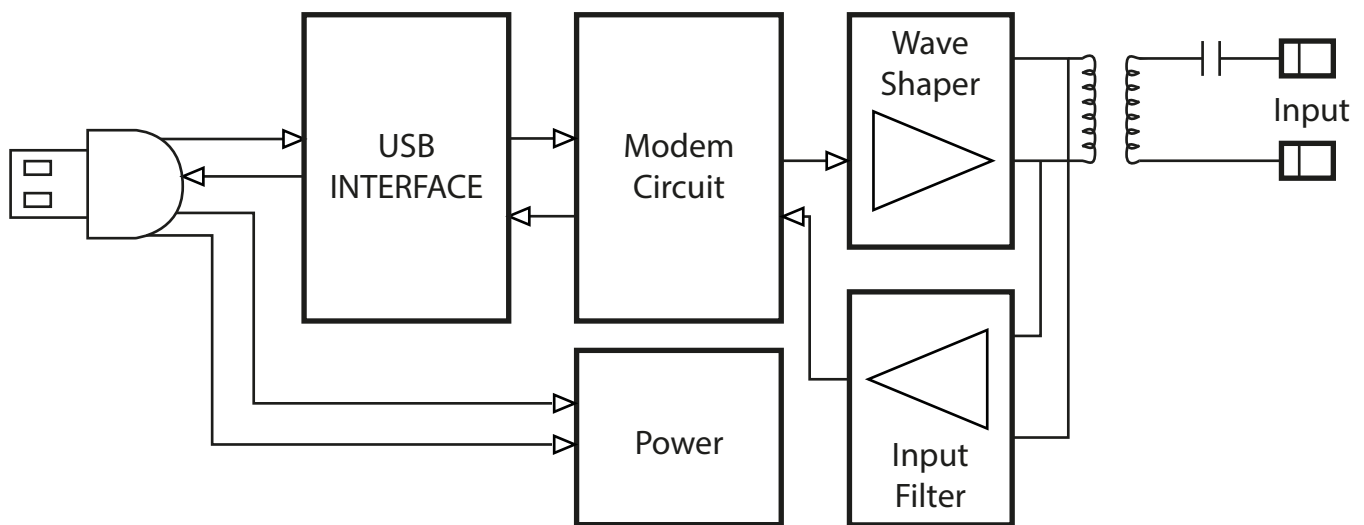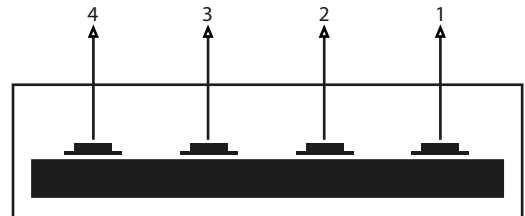| Pin #	Designator
1	VCC
2	D-
3	D+
4	GND

Figure 3.1: HIUSB functional block diagram

4 Functional Specifications

- Power supply: _____ less than 20mA from USB port

- Operating temp.: _____ -20 to 70C

- Storage temp.: _____ -20 to 70C

- Humidity: _____ 10 to 90%

5 Performance Specifications

- Computer port: USB compliant

- Computer o.s.: Windows, MacOS, Android

- HART protocol: HART 1 through 7

- HART modulator output: 400mVpp through 250 Ohm (see figure 5.1)

- HART modulator input: 120mVp to 1500mVpp

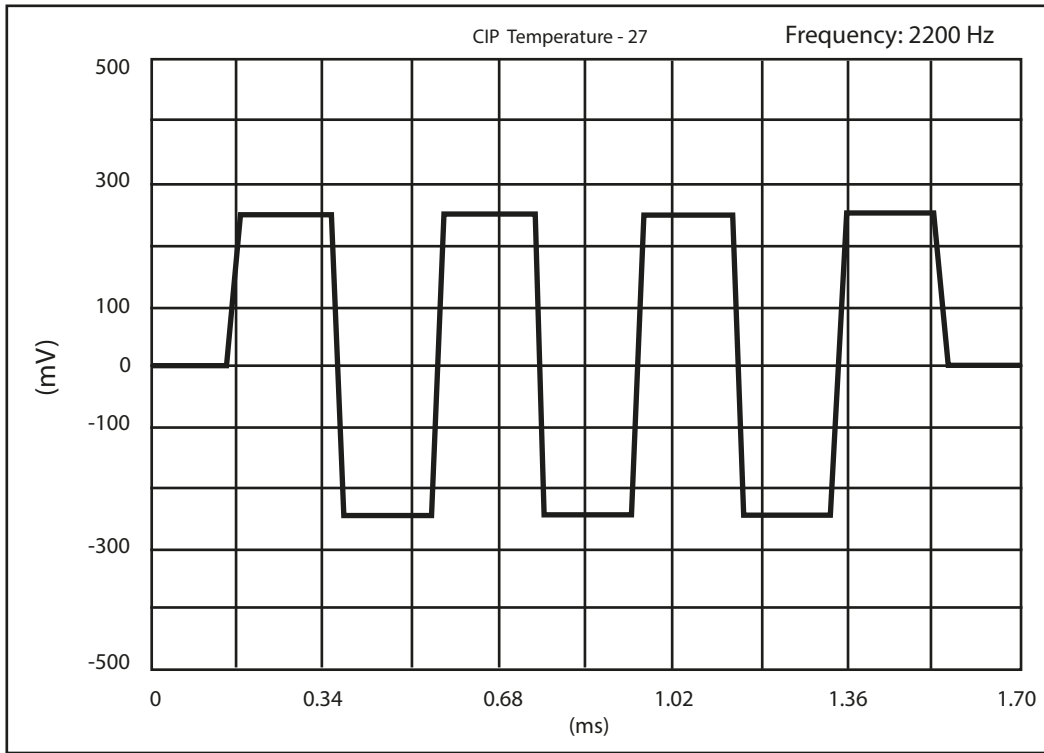- HART-USB isolation: 500Vac @ 60HZ

CIP - Temperature - 27   Frequency: 1200 Hz
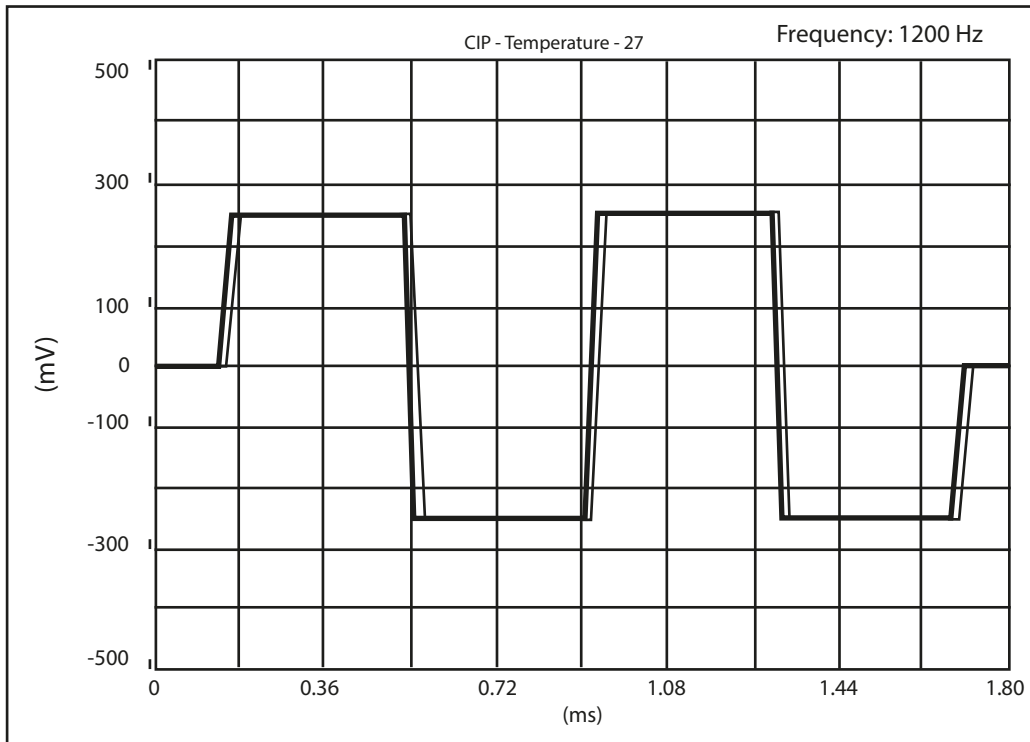
Figure 5.1: modulation wave shape

Vibration Effect:	Meets SAMA PMC 31.1

Electro-Magnetic Interference:	Designed to comply with IEC 801

6   Physical Specifications

Electrical Connection:	USB cable up to 400mm HART cable expandable to 1 meter.

Mounting:	No special requirement

7   Hardware Configuration

The HIUSB is composed of 4 sections, the USB electronic interface, the HART modem, the galvanic isolation module, and the a/c current section. These sections are designed to satisfy the respective protocols to provide serial communication without interference to the process control current signal and also keeping the 2 networks electrically isolated to prevent damaging ground faults.

7.1   USB computer cable

The HIUSB computer cable will connect directly into any PC with USB port, it will transfer serial data through USB protocol and take power from the same PC connector. The HIUSB require less than 1mA of current therefore it will not cause issues when used with modern PC or Laptop.
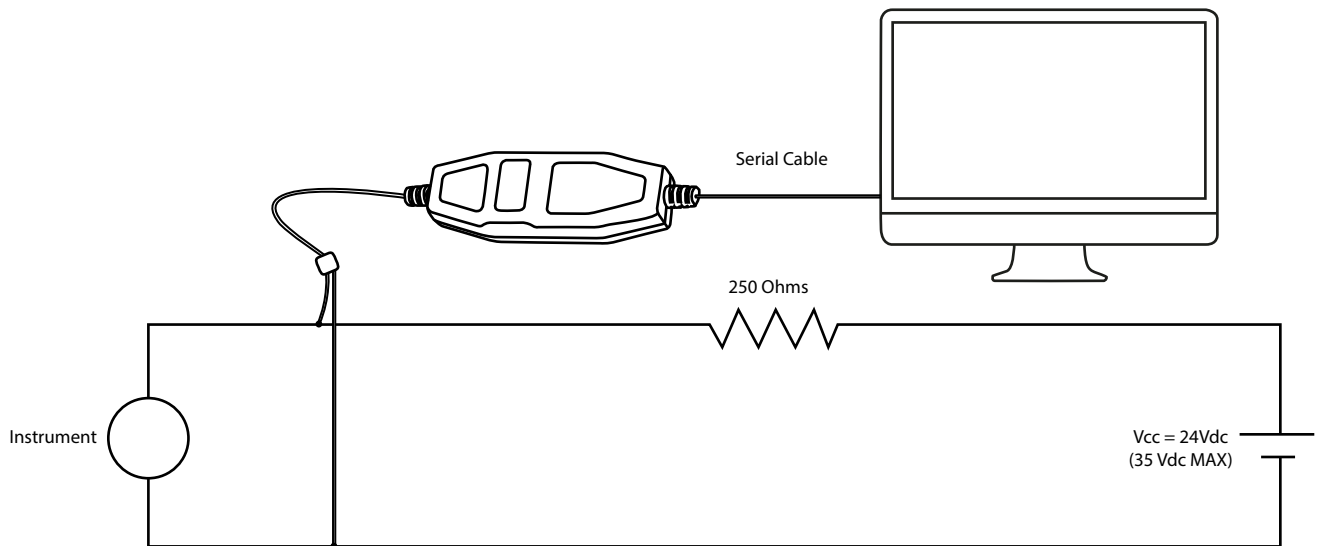
Figure 7.1.1: connection practice

7.2 HART network cable

The HIUSB HART cable is delivered with hook conector to provide fast and easy attachment to any bare wire or field instrument terminals, its expandable cable 1 meter long will allow momentary connections inside panels or hard to access instruments, allowing easy configurations and commissioning of HART devices.

8   Software Configuration

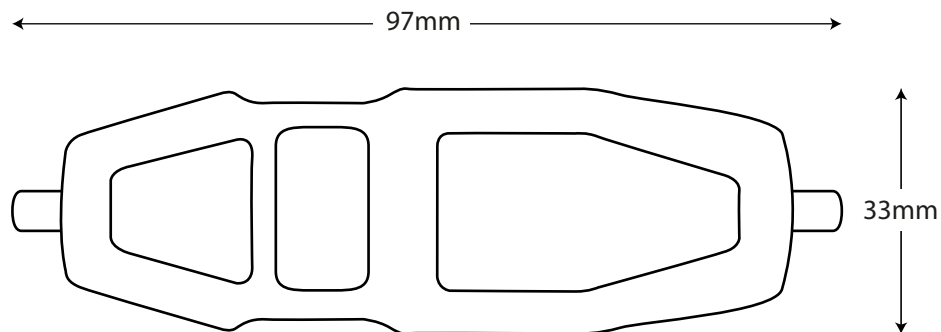The HIUSB will work with any USB compliant PC software with emulation package for protocol RS-232

9   Mechanical Dimensions

Fig. 9.1 – Mechanical Dimensions

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