

**MEMSENSE**

**USB Host Bridge Interface  
Series Documentation**

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Version 2

[www.memsense.com](http://www.memsense.com)

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# MEMSENSE

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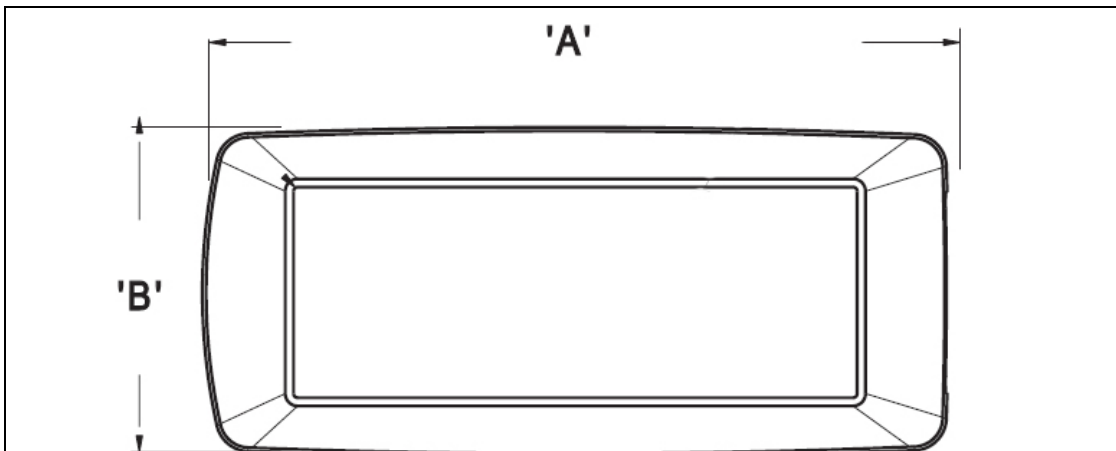
## 1 INTRODUCTION

### 1.1 The USB Host Bridge Interface

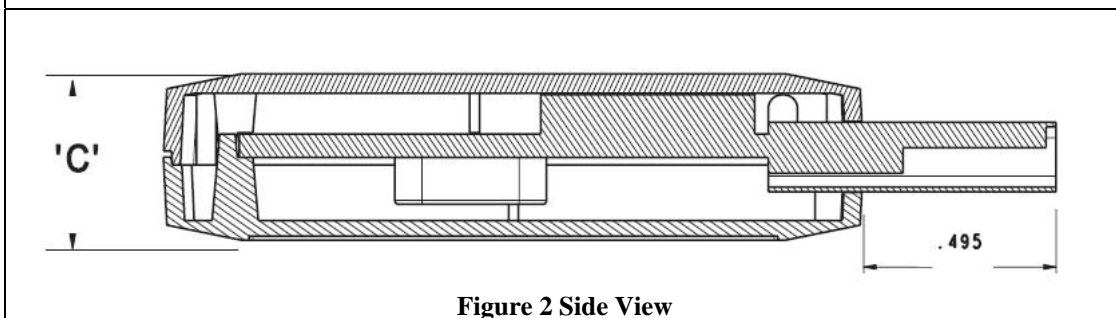
The USB Bridge includes a USB 2.0 full-speed function controller, USB transceiver and serial data bus interface in a compact 2.3 x 0.8 in. package for use with MEMSense IMU's (see Appendix A for part numbering specifications). Table 1 shows the dimensions for Figures 1 and 2.

**Table 1 Dimensions**

	'A'	'B'	'C'
<b>Enclosure Dimensions (inches)</b>	<b>1.80</b>	<b>0.8</b>	<b>.48</b>



**Figure 1 Case Dimensions**



**Figure 2 Side View**

## 2 SETUP

### 2.1 Drivers

USB-422 operates using virtual com port drivers that are compatible with typical com port communication. These devices show up as COMx ports in the windows device manager. The USB-422 device consists of a pair of RX (receive) data signals, voltage, and ground. The data format uses 8 data bits, 1 start bit, 1 stop bit, and no parity.

USB- I<sup>2</sup>C devices operate using SIlabs USBXpress device drivers. The USBXpress drivers allow simple, instant access to IMU data.

Driver and data acquisition downloads can be found at <http://memsense.com/support/downloads.asp>.

## 3 HARDWARE

### 3.1 Connections

The USB0x ships with a four inch cable terminated with a male Hirose six pin connector (Hirose part number HR30-6R-6P) as shown in Figure 3 below. This connector mates with female Hirose connector part number HR30-6P-6S. Pins two and five have external cabling connected to each pin for connection to an external power supply. These connections must be made to power the device and the IMU. The user must ensure the circuit interfacing the device is configured to match the pin description as given in Section 3.2.

### 3.2 Pin Function Description

The pin functions are listed in Table 2 below.

**Table 2 Hirose pin functions**

Pin No.	USB-422	USB-I2C
1	Not Used	SDA
2	Vdd	Vdd
3	RS422_RX_A	Not Used
4	RS422_RX_B	Not Used
5	GND	GND
6	Not Used	SCL

**Figure 3 HR30-6R-6P**

**Table 3 Pin Descriptions**

Name	Function
SCL	SMBus Serial Clock Line
SDA	SMBus Serial Data Line
RS422_RX_A	RS422 Noninverting Receiver Input
RS422_RX_B	RS422 Inverting Receiver Input
Vdd	8.3 V Power
GND	Ground

## 4 APPENDIX A

### 4.1 Part Numbering

**Table 4 Ordering Numbers**

Part	Description
USB-422	IMU UART to USB Host Bridge
USB- I <sup>2</sup> C	IMU I <sup>2</sup> C to USB Host Bridge

### 4.2 Specifications

**Table 5 Specifications**

PARAMETER	SPECIFICATION	UNITS	CONDITIONS
<b>Operational Requirements</b>			
Operating Input Voltage	8.1 to 8.5	VDC	8.3 Typical
Supply Current	22	mA	Typical
Mass	15	grams	
Operating Temperature	-40 to +85	°C	
Storage Temperature	-55 to +125	°C	
Typical Values at 25°C, V <sub>supply</sub> = 8.3 VDC, unless otherwise noted			

## 4.3 Terms and Conditions, Warranty

**DEFINITIONS** - As used herein: “Seller” means MEMSense, 2693D Commerce Road, Rapid City, SD 57702. “Buyer” means the party purchasing Product(s) from the Seller. “Product” means all articles, materials, work or services offered by the Seller and described in the accompanying quotation, acknowledgement, invoice, or other Seller form. “Order” means any purchase Order or contract issued by the Buyer for Products provided by the Seller.

**WARRANTY** - Seller warrants that the Products will be free from defects in material and workmanship and conform in all material respects to their applicable specifications for a period of one (1) year from the date of delivery (“Warranty Period”), when operated under normal conditions and in accordance with their applicable specifications. For any breach of this warranty, Seller will, at its option and expense and as its sole obligation, and as Buyer’s exclusive remedy, repair or replace any defective Product returned to Seller during the Warranty Period, provided that an examination by Seller discloses to Seller’s reasonable satisfaction that a defect is covered by this warranty. This warranty does not apply to any Products that have been (i) subject to misuse, neglect, or abuse, (ii) improperly installed or maintained, or (iii) repaired or altered by anyone other than Seller. The warranty period for Products repaired or replaced under this warranty shall be limited to the components repaired or replaced and shall run for a period of one hundred and eighty (180) days from the date of delivery or the balance of the original one (1) year Warranty Period (excluding the time the Products were out of service and in Seller’s plant), whichever is longer. **EXCEPT AS STATED IN THIS SECTION, SELLER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AND SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, TITLE, AND NON-INFRINGEMENT OF THIRD PARTY RIGHTS.**

**LIMITATION OF LIABILITIES** - In no event shall Seller be liable to Buyer or any third party for consequential, indirect, punitive, special, or incidental damages (including but not limited to loss of profits) arising from or relating to the sale, delivery or use of the Products. Seller’s total cumulative liability under this Agreement to Buyer or any third party (including indemnity obligations), whether in contract or tort or otherwise, will not exceed the amount paid by Buyer to Seller for the Product sold hereunder giving rise to such liability.

**DELAYS** - Seller shall not be liable for delay in delivery or for failure to manufacture, due to causes beyond its reasonable control, including but not limited to acts of God, acts of any government, acts of civil or military authority, acts of Buyer, application of US Government priorities, Government delays in granting Export Licenses, fires, strikes, floods, war, terrorism, riot or civil commotion, delays in transportation, difficulty in obtaining necessary labor or materials. In the event of any such delay, date of delivery shall be extended for a period of time equal to that lost by reason of the delay.

**TAXES** - Prices do not include sales or excise tax, VAT, duties or other governmental charges resulting from this transaction or the manufacture, sale, ownership, possession, or use of the Products, all of which must be paid by Buyer. Buyer shall provide Seller a tax exemption certificate acceptable to the taxing authorities.

**SHIPMENT** - Title to all purchased material and risk of loss therefore is passed from Seller to Buyer at the time of shipment from Seller’s facility. Unless otherwise agreed upon in writing, all purchased material will be shipped uninsured. Seller may request partial shipment and invoice therefore.

**EXPORT LICENSE** – Buyer will comply with all applicable export and import control laws and regulations in its use of the Products and Buyer will not export or re-export the Products or any technical data or confidential information derived from or pertaining to the Products without all required United States and foreign government licenses.