

## In-Line USB Kit

### Compatible with:



Load Cells



Torque Sensors



Pressure Sensors



Multi-Axis Sensors



### NOTABLE FEATURES

- Simple connection to sensor and computer
- Up to 24 Bit Resolution, 0.001% Accuracy and Nonlinearity
- Linearization utilizing SENSIT Software
- Excellent sampling rate up to 14K per second
- Integrated digital filter to reduce high frequency noises
- Capability to store calibration values inside the on-board non-volatile memory (in order to apply the real-time calculation to account nonlinearities)
- Alternative configurations can also be stored, eliminating the need for a TEDS chip
- Works alongside SENSIT, LabVIEW, or DLL derived softwares
- No external power supply needed

**FUTEK's USB Solutions are external modules serving as digital interfaces between a sensor and a computer. Traditionally, testing platforms consisted of a sensor, amplifier, filter, data acquisition system and software to transmit data to a computer. FUTEK's USB Solutions eliminate the need for all additional instrumentation, condensing your platform into just your sensor, the USB device and your computer.**

FUTEK's engineering team took into account all the capabilities needed to create a high-performance data exchange solution. From sampling rates to accuracy to noise-free resolution, FUTEK's USB Series offers customers with the ultimate digitized instrument. With five model options, users can pair these modules with load cells, torque sensors, pressure sensors, or multi-axis sensors to measure anything from microgram loads to torsion, angle and speed. Needless to say, there is a USB Solution for almost every strain gauge sensor platform.



### Sensor Solutions Source

Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software

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

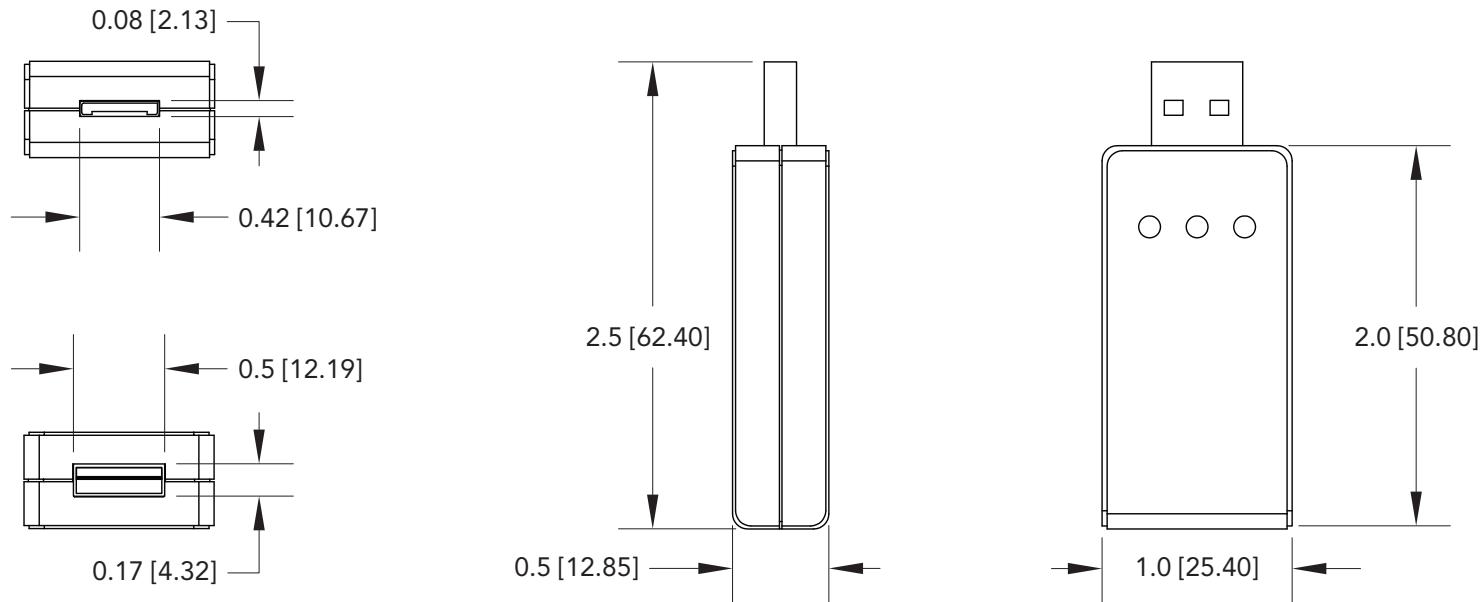


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**DIMENSIONS** inches [mm]**FEATURES**

PARAMETER	USB210	USB220	USB240 <sup>1</sup>	USB320	USB410
Compatible with	☒	☒	☒	☒	☒
USB 2.0 Communication Link	✓	✓	✓	✓	✓
USB Bus-Powered (5V)	✓	✓	✓	✓	✓
Integrated Shunt Cal	✓	✓			✓
Input /Output Short Circuit Protection	✓	✓	✓	✓	✓
ASCII Streaming	✓	✓		✓	✓
Blinking Blue LED Indicator (10 Hz): Module Auto-Calibration	✓	✓	✓	✓	✓
Blinking Blue LED Indicator (1 Hz): Module Normal Operation	✓	✓	✓	✓	✓
Green LED Indicator: USB Power	✓	✓	✓		✓
Red LED Indicator: USB Data Link	✓	✓	✓	✓	✓
Quadrature Encoder Input					✓
CE Approval	✓	✓	✓	✓	✓
RoHS Compliant	✓	✓	✓	✓	✓
Multi-Channel			✓		

<sup>1</sup> USB240 will be available second quarter of 2013.

For high-speed measurement, consult factory for model USB230. For mv/V, amplified, and encoder input, see model USB520.

SPECIFICATIONS				
PARAMETER	USB210	USB220	USB320	USB410
Sampling Rate (Samples Per Second)	Up to 1,000	Up to 4,800	Up to 4,800	Up to 200
Resolution	Up to 18 bits (ENOB)	Up to 19 bits (ENOB)	Up to 19 bits (ENOB)	Up to 18 bits (ENOB)
Accuracy	0.001% of FSR	0.001% of FSR	0.001% of FSR	0.001% of FSR
Temperature Coefficient Factor	10 ppm	10 ppm	10 ppm	10 ppm
Standard Input Range	$\pm 4 \text{ mV/V}^7$	$\pm 4 \text{ mV/V}^7$	$\pm 10 \text{ VDC}$ or $4\text{--}20 \text{ mA}^2$	$\pm 4 \text{ mV/V}^7$
Output	Digital Packetized Data	Digital Packetized Data	Digital Packetized Data	Digital Packetized Data
Excitation Output	4.5 VDC	4.6 VDC	12 VDC <sup>3</sup>	4.5 VDC
Max. Bridge Resistance	5,000 $\Omega$	5,000 $\Omega$	N/A	5,000 $\Omega$
Min. Bridge Resistance	50 $\Omega$	50 $\Omega$	N/A	50 $\Omega$
Integrated Digital Filter	50 Hz / 60 Hz rejection (100 dB)	50 Hz / 60 Hz rejection (100 dB)	50 Hz / 60 Hz rejection (100 dB)	50 Hz / 60 Hz rejection (100 dB)
External Power Supply	Not Required	Not Required	Not Required	Not Required
On-Chip Memory	1 Kilobyte	1 Kilobyte	1 Kilobyte	1 Kilobyte
Stored Calibration	Up to 16 Point	Up to 16 Point	Up to 16 Point	Up to 16 Point
Approximate Weight	10 grams	10 grams	10 grams	10 grams
Encoder Input	N/A	N/A	N/A	Quadrature Leading and Lagging Pulse
Speed Measurement	N/A	N/A	N/A	Up to 150k pulses per second <sup>4</sup>
Angle Measurement (alpha)	N/A	N/A	N/A	Up to 150k pulses per rotation (PPR) <sup>4</sup>
Max. Resolution (noise-free bits) <sup>5</sup>	16	19	16	16
Min. Resolution (noise-free bits) <sup>6</sup>	8	13.5	11.5	13

<sup>2</sup> For 4–20 mA use item FSH03634, for 10 VDC FSH03631<sup>3</sup> 1W power output.<sup>4</sup> Speed =  $\Delta\alpha \times 60 \div \text{PPR}$ <sup>5</sup> At lowest sampling rate<sup>6</sup> At highest sampling rate<sup>7</sup>  $\pm 500 \text{ mV/V}$  consult factory.

For sampling rate in excess of 14KHz, consult factory for model USB230. For mv/V, amplified, and encoder input, see model USB520.

## EXAMPLE OF PRODUCT CONFIGURATION

SENSOR TYPE	USB SERIES	SERVICES	SOFTWARE
			
Load	USB210	• Integration	SENSIT Test & Measurement Software
Torque	USB220	• Configuration	
Pressure	USB320	• Calibration and Certification	
Multi-Axis	USB410	• Sensor + Instrument NIST Traceable	

## COMING SOON NEW USB SOLUTIONS TO COME

FUTEK's engineering team is set on building solutions for all application circumstances. Whether your platform utilizes a load cell or a multi-axis sensor, we want you to have the most efficient feedback instrument possible. Therefore, our engineering team is constantly producing new USB solutions:

- USB240: multiple channel measurements
- USB520: or mV/V, voltage, current, and encoder input

Contact our sales team for more information about our upcoming USB releases.

## RELATED ACCESSORIES

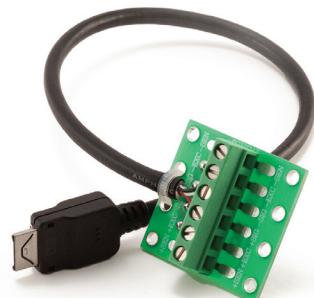
The following accessories are readily available with our USB Series products. Please visit [www.futek.com](http://www.futek.com) for full details on these items.



## HIROSE CONNECTOR (INCLUDED)

Item Number: FSH03320

- Connector Plug Kit for USB210/USB220/USB230/USB320
- Includes 12 pos. connector plug and appropriate size bushing (4.0, 4.5, 5.0)



## SCREW TERMINAL KIT

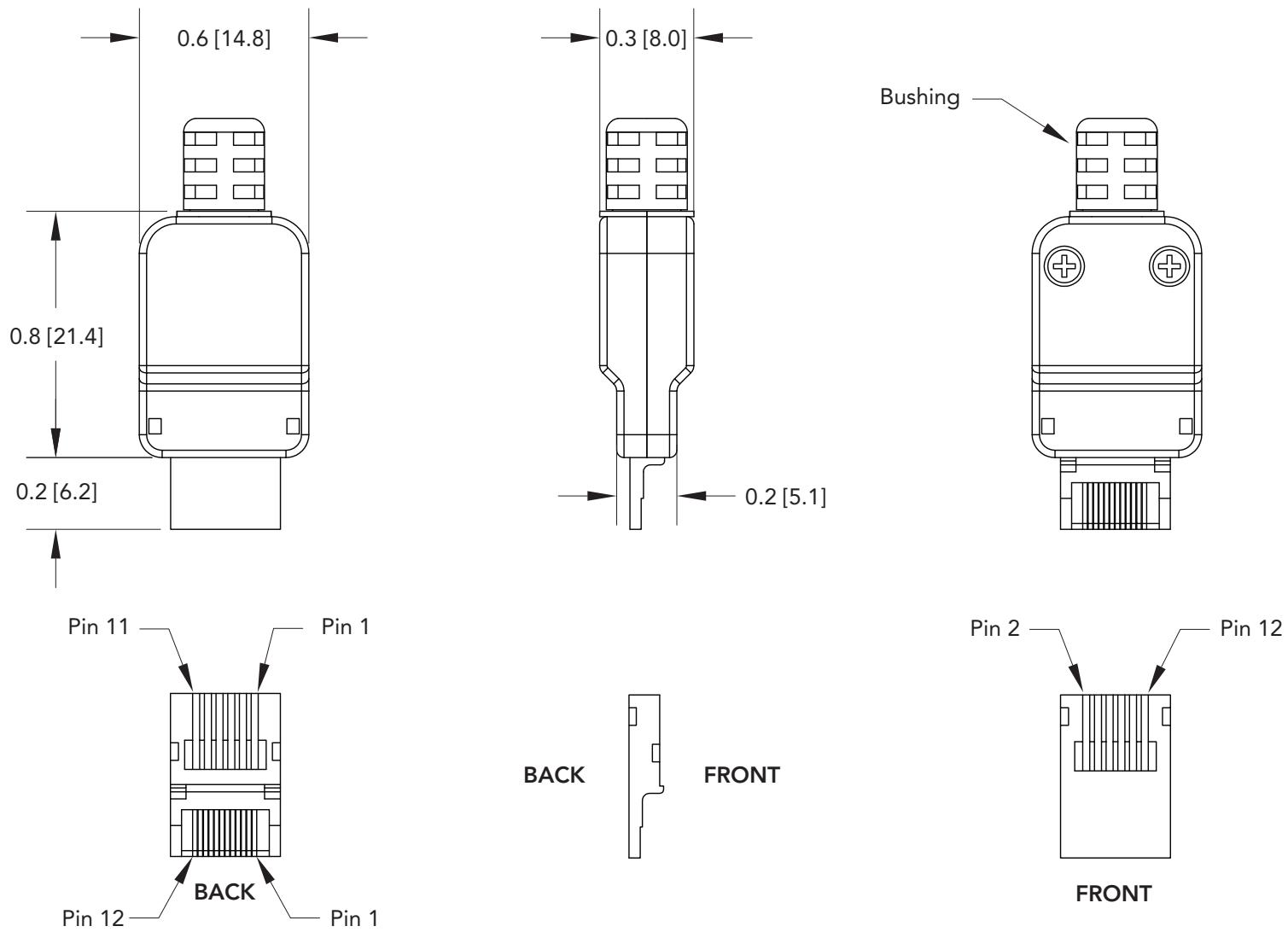
Item Number: FSH03520

- USB Screw Terminal adapter board (2 ft cable)
- For use with USB210/USB220/USB230/USB320

# FUTEK USB Series Connector Plug Kit

5

## DIMENSIONS inches [mm]



## HIROSE MALE (SENSOR SIDE)

PIN #	USB210/220/230 (FSH03631) USB320 4 WIRE VOLTAGE	(FSH03631) USB320 3 WIRE VOLTAGE	(FSH03634) USB320 3 WIRE CURRENT	(FSH03634) USB320 2 WIRE CURRENT	USB410
1	+SIGNAL	+SIGNAL	+SIGNAL	+SIGNAL	+SIGNAL
2	-SIGNAL	N/A	N/A	N/A	-SIGNAL
5	N/A	N/A	N/A	N/A	P1-LEADING PULSE
6	N/A	N/A	N/A	N/A	P2-LAGGING PULSE
11	+EXCITATION	+EXCITATION	+EXCITATION	+EXCITATION	VCC/+EXCITATION
12	-EXCITATION/SHIELD <sup>8</sup>	-EXCITATION/SHIELD <sup>8</sup>	-EXCITATION/SHIELD <sup>8</sup>	N/A	GND/-EXCITATION/ SHIELD <sup>8</sup>

<sup>8</sup> Use Y connection on pin 12 to make connecting the -EXCITATION and SHIELD easier

## SENSIT™ Test and Measurement Software

FUTEK's USB Solutions are designed to work alongside software, whether it is our own, LabVIEW™/MATLAB™ or DLL derived software. The SENSIT Software is designed to display and record measurements made by USB Sensors. At its core, the software is incredibly simple and efficient. Users can take advantage of basic features such as the display mode, where the sensors peak/valley is shown, or utilize more advanced functions for data logging and graphing. Programmed entirely by FUTEK engineers, this software seamlessly integrates with all USB Sensors.



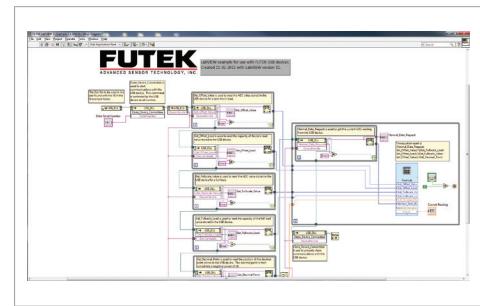
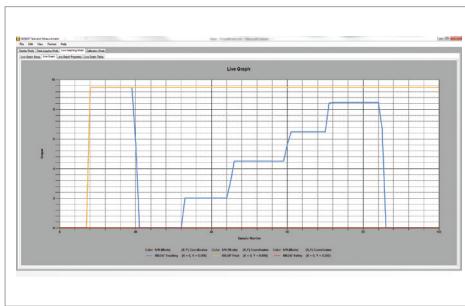
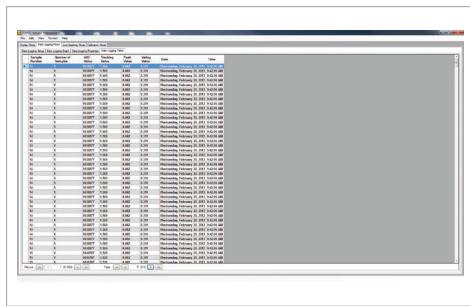
### 16 CHANNELS

With FUTEK's SENSIT software, you are able to measure the activity of 16 different sensors in the same platform, record the data for each, or activate the display for the sensors you want to monitor. Regardless of the operation, you're in control.



### MATH f(x)

Need to run a few calculations? Take advantage of the built in calculator tool for involved permutations. This tool is very valuable in avoiding miscalculations.



### DATA LOGGING

You can easily utilize the SENSIT software to measure and track your tests with the data-logging feature. Users can set up their tests and record all of the data taking place with the USB Software. A convenient export to excel option is also available making this feature very powerful.

### LIVE GRAPHING MODE

One of the great features of SENSIT is its ability to perform live graphing. Operating simultaneously with the data logging feature, the graph feature serves as a great data visualization tool giving you an image of your measurements as data is being recorded.

### COMPATIBLE WITH LabVIEW

Test & Measurement engineers rely on a number of great software sources to perform their daily operations. Knowing the popularity of National Instruments LabVIEW software, you can take comfort that SENSIT is offered with a dynamic link library (DLL file) that is used to communicate with LabVIEW.

To download a trial version of SENSIT or any additional support documents, visit [www.futek.com/sensit](http://www.futek.com/sensit)

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