FUTEK
ADVANCED SENSOR TECHNOLOGY, INC.

Quick Start Guide

USB520

External USB Output Kit

Sensor Solutions Source
Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software

www.futek.com

Getting Help

TECHNICAL SUPPORT

For more USB support documentation please visit: https://www.futek.com/usb-output-modules

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EM1017-C

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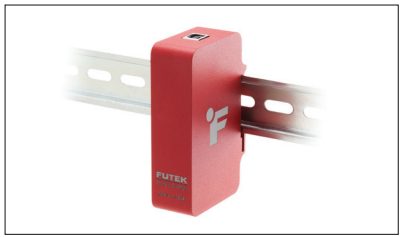
Layout and Included Accessories

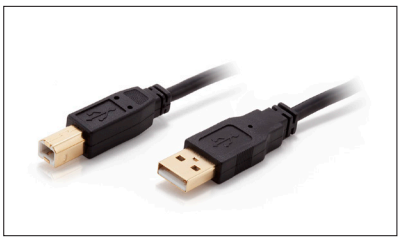
Included with the USB520 is one 12 pin male plug for use with a sensor, and one 4 pin USB cable assembly for connections to a computer USB 2.0 port.

12 PIN SENSOR CONNECTOR

12 PIN SENSOR BINDER PLUG



DIN RAIL MOUNTED



USB 2.0 HI-SPEED A/B CABLE

SENSOR CONNECTIONS

PIN	SYMBOL	DESCRIPTION
A	+E	+Excitation/+Sense
B	+S	+Signal
C	–E	–Excitation/–Sense
D	–S	–Signal
F	24_OUT	24V Output
G	GND_OUT	Ground

PIN	SYMBOL	DESCRIPTION
H		4.75V Output
J	–V	–V and –mA Amplified Input Connections
K	+V	+V and +mA Amplified Input Connections
L	PLEAD	Leading pulse from sensor
M	PLAG	Lagging pulse from sensor

For 6 wire sensors connect +Sense to +Excitation and –Sense to –Excitation.

Note: Sensor cable shield connections should be grounded on one end, either the sensor side or the USB520 sensor input side, to avoid potential ground loops.

Shield should be connected to cable clamp of binder cable assembly when connecting on instrument side.

12 PIN SENSOR CONNECTOR TO USB520

Binder Connector From Sensor

The ± Excitation and ± Signal pins are used for mV/V non-amplified output sensors.

For six wire sensors with ± Sense, the ± Sense connections should be connected to the ± Excitation connections respectively.

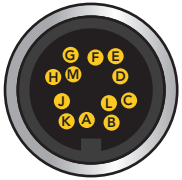
For amplified output sensors, the selectable 24V Output and Ground pins can be used to power the sensor, and the ± Amplified pins can be used for Voltage or Current outputs from the sensor.

The 4.75V Output and Ground pins can be used to power circuits, such as encoders in our rotary torque sensors.

The Leading Pulse and Lagging Pulse pins can be used with the Ground pin for encoder outputs.

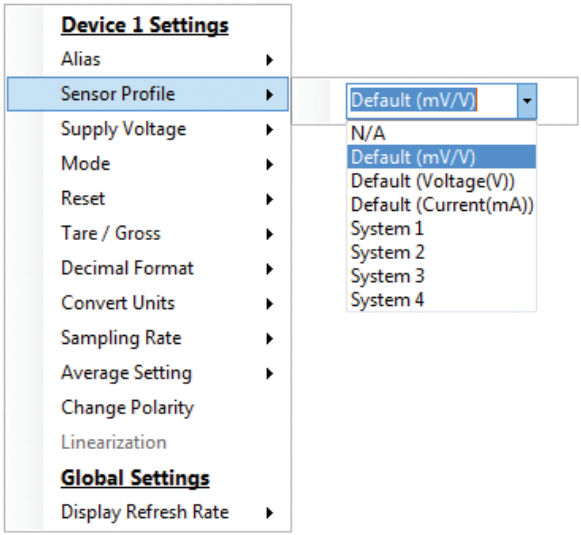
Typically our rotary torque sensor encoders will have Angle 1 on the Leading Pulse pin and Angle 2 on the Lagging pulse pins.

If the Leading Pulse, Pin L, leads Pin M the encoder count will increase, and if the Lagging Pulse, Pin M, leads Pin L the encoder count will decrease.



The USB520 Spec Sheet can be found here:
https://media.futek.com/content/futek/files/pdf/productdrawings/usb520.pdf

Multiple Profile Selection in SENSIT Software



In SENSIT, profile options can be accessed by right clicking in the Display Mode screen.

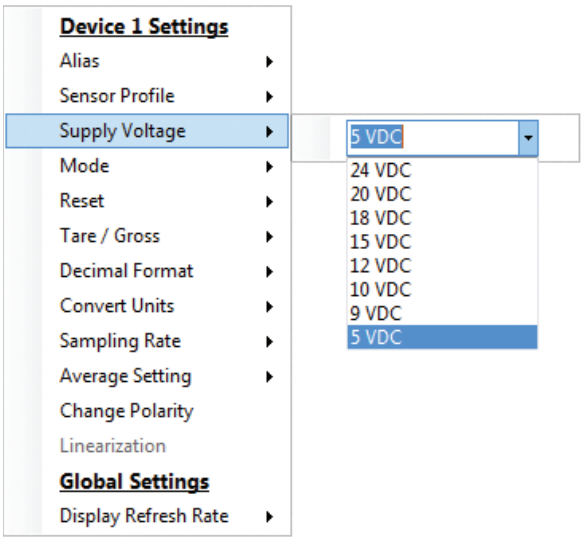
The USB520 offers four customizable calibration profiles and three default profiles. The default profiles include, mV/V, Voltage, and Current.

Profiles listed as System 1 through 4 can be user defined in the SENSIT calibration and can be used for different types of sensors or the same sensor.

One way to utilize the multiple profiles is to improve the accuracy for the lower range of a sensor by having one profile for the full sensor range and another one for the lower range of the sensor. This would allow a full capacity profile and a lower range capacity profile for the same sensor to be used as needed.

Please refer to the SENSIT Quick Start Guide, or our online SENSIT support documentation, for more information on using SENSIT at: https://www.futek.com/sensit-software-support

Supply Voltage Selection in SENSIT Software

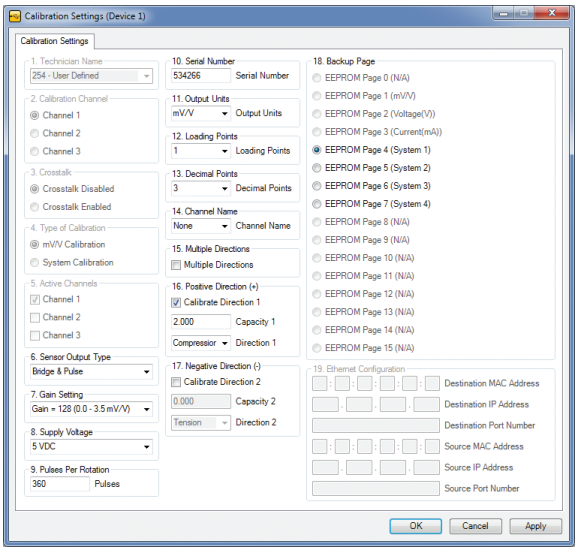


The USB520 offers a selectable 5 VDC to 24VDC, 1 Watt power supply on its amplified 24V Out and Ground pins to power amplified sensors, such as the FUTEK rotary torque line, TRS605.

In SENSIT supply voltage options can be accessed by right clicking on the Display Mode screen.

When changing to a default profile the supply voltage will reset to 5 VDC to avoid possible damage to the sensor. The set voltage specified in the calibration will be used for programmable system profiles.

Calibration Settings in SENSIT Software

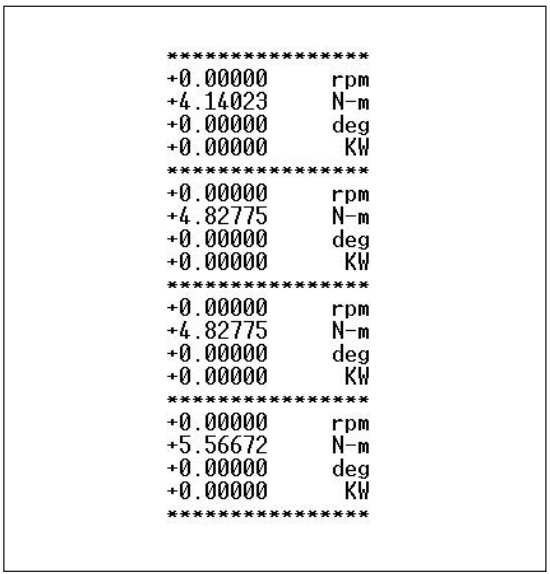


Four EEPROM pages are available for custom sensor profiles, or calibrations, in the SENSIT calibration menu under the Calibration Settings.

The sensor output type does not have to be the same for each profile, meaning the USB520 can be calibrated to multiple sensors with different output types, such as amplified and mV/V.

SENSIT utilizes a live calibration with known loads for the USB520.

ASCII Streaming Output



This is an example of the streaming ASCII output for the USB520.

The USB520 can output an automatic streaming ASCII output of the current reading.

The ASCII output will turn off when the USB520 is in command mode, such as when in use with SENSIT. Resetting, or unplugging and re-plugging in the USB instrument, will restart the ASCII streaming output.

The ASCII output is updated up to 10 samples per second.

Specifications

FEATURES

- USB 2.0 Communication Link
- USB Bus - Powered (5V)
- Input/Output Short Circuit Protection
- Streaming ASCII Output

ENVIRONMENT

- Operating Temperature: –13°F to 185°F [–25°C to 85°C]
- Storage Temperature: -40°F to 257°F [–40°C to 125°C]

ENCODER INPUT*

- Encoder Input: Quadrature Leading and Lagging Pulse
- Speed Measurement: Up to 150k pulses per second[1]
- Angle Measurement (α): up to 10k pulses per rotation (PPR)[1]

[1] Speed = $\Delta\alpha \times 60$ / PPR

* Encoder information is updated at 10hz.

GENERAL

- Internal Resolution: 24 bits
- Output: Digital Packetized Data
- Integrated Digital Filter: 50 Hz/60 Hz rejection (100 dB)
- On Chip Memory: 1 Kilobyte
- Up to 16 Point Stored Calibration
- Weight: 0.43 lb (195 g)
- Selectable Supply Voltage 5-24 VDC / 1W

Specifications (continued)

STRAIN GAUGE mV/V INPUT

- Bridge Excitation: 4.6 VDC
- Standard Input Range: ± 3.4 mV/V (factory default)
- Optional Input Range: ± 400 mV/V
- Min. Bridge Resistance: 50 Ohm
- Max. Bridge Resistance: 5000 Ohm

VOLTAGE INPUT

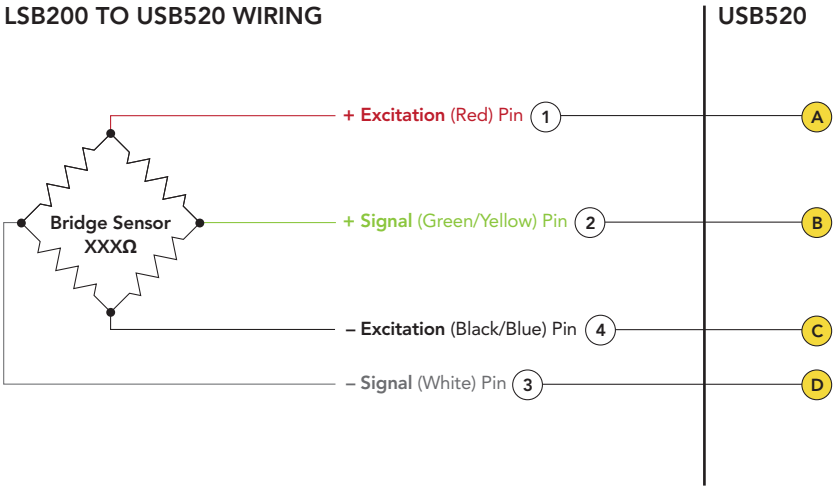
- Standard Input Range: ± 10 VDC (factory default)

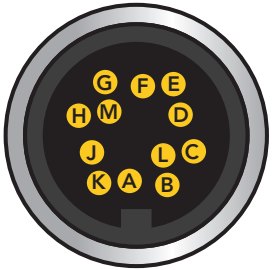
CURRENT INPUT

- Standard Input Range: 0–20 mA (factory default)

mV/V Wiring Example

LSB200 TO USB520 WIRING

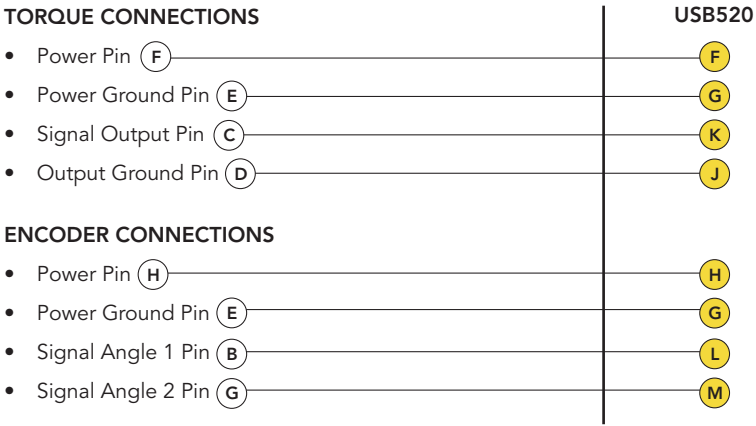


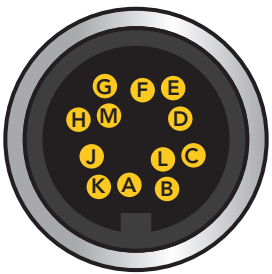


Note: For sensors with ± Sense, the sense wires must be connected to ± Excitation or clipped off.

Amplified Output Wiring Example

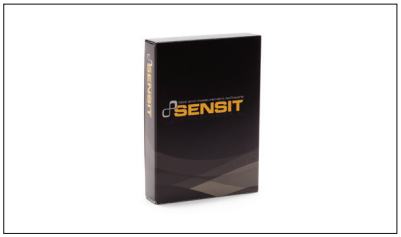
TRS605 TO USB520 WIRING



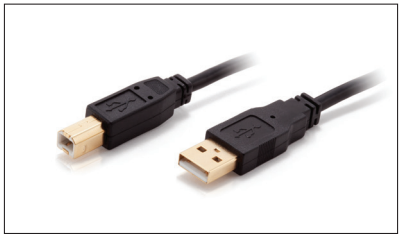


Note: Encoder and Torque share the same power ground connection E to G. Encoder connections supported by the USB520.

Accessories



SENSIT™ TEST AND MEASUREMENT SOFTWARE
Item Number: FSH03189



USB 2.0 HI-SPEED A/B CABLE WITH FERRITE CHOKES (M/M) 6 FT
Item Number: GOD04123

BINDER MALE PLUG WITH CABLE CLAMP
Item Number: GOD02975

Programming Support
FUTEK offers our USB DLL file as well as LabVIEW and Visual Basic examples online on the SENSIT support page at:
https://www.futek.com/sensit-software-support

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RoHS CE ANSI Z540-1 ISO 17025 ISO 9001 ISO 13485 U.S. Manufacturer

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