

Quick Start Guide

USB520/USB530 External USB Output Kit

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

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Getting Help

TECHNICAL SUPPORT

For more USB support documentation please visit: <u>http://www.futek.com/usb/support.aspx</u>



EM1017

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Table of Contents

Layout and Included Accessories						4
Binder Connector Wiring Information .						5
Multiple Profile Selection in SENSIT .						7
Supplied Voltage Selection in SENSIT						8
System Calibration in SENSIT						9

ASCII Streaming Output	.10
Specifications	.11
mV/V Wiring Example	.13
Amplified Wiring Example	.14
Additional Accessories	.15

Layout and Included Accessories

Included with the USB520 and USB530 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

SENS	OR CONNE	CTIONS			
PIN	SYMBOL	DESCRIPTION	PIN	SYMBOL	DESCRIPTION
А	+E	+Excitation/+Sense	Н		4.75V Output
В	+S	+Signal	J	–V	–V and –mA Amplified Input
С	–Е	-Excitation/-Sense/Shield			Connections
D	–S	–Signal	K	+V	+V and +mA Amplified Input Connections
F	24_OUT	24V output	L	PLEAD	Leading pulse from sensor
G	GND_OUT	Ground/Shield	М	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.

Cable shield connection can also be made to sensor 12 pin Binder connector.

12 PIN SENSOR CONNECTOR TO USB520 AND USB530



Binder Connector From Sensor

The \pm Excitation and \pm 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: http://www.futek.com/files/pdf/Product%20 Drawings/USB520.pdf



And the USB530 Spec sheet can be found here: http://www.futek.com/files/pdf/Product%20 Drawings/USB530.pdf

Multiple Profile Selection in SENSIT Software

Device 1 Settings	
Alias	•
Sensor Profile	•
Supply Voltage	•
Mode	•
Reset	•
Tare / Gross	•
Decimal Format	•
Convert Units	•
Sampling Rate	•
Average Setting	+
Change Polarity	
Linearization	
Global Settings	
Display Refresh Rate	•

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

The USB520 and USB530 offer 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: http://www.futek.com/sensit/support.aspx

Supply Voltage Selection in SENSIT Software

Device 1 Settings	
Alias	•
Sensor Profile	•
Supply Voltage	•
Mode	•
Reset	•
Tare / Gross	•
Decimal Format	•
Convert Units	•
Sampling Rate	•
Average Setting	•
Change Polarity	
Linearization	
Global Settings	
Display Refresh Rate	•

The USB520 and USB530 offer 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

libration Settings			
1. Technician Name	10. Serial Nu	mber	18. Backup Page
254 - User Defined	· 534266	Serial Number	EEPROM Page 0 (N/A)
2. Calibration Channel	11. Output U	Inits	 EEPROM Page 1 (mV/V)
Channel 1	mV/V	 Output Units 	EEPROM Page 2 (Voltage(V))
Channel 2	12. Loading	Points	 EEPROM Page 3 (Current(mA))
Channel 3	1	 Loading Points 	EEPROM Page 4 (System 1)
3 Crosstalk	13 Decimal	Pointe	EEPROM Page 5 (System 2)
Crosstalk Disabled	3	Decimal Points	EEPROM Page 6 (System 3)
Crosstalk Enabled	14 Channel		EEPROM Page 7 (System 4)
4. Type of Calibration	None	Channel Name	EEPROM Page 8 (N/A)
mV/V Calibration			EEPROM Page 9 (N/A)
System Calibration	15. Multiple E		EEPROM Page 10 (N/A)
	Multiple I		EEPROM Page 11 (N/A)
5. Active Channels	16. Positive I		EEPROM Page 12 (N/A)
Channel 2	Calibrate		EEPROM Page 13 (N/A)
	2.000	Capacity 1	EEPROM Page 14 (N/A)
Channel 3	Compression	 Direction 1 	EEPROM Page 15 (N/A)
6. Sensor Output Type	17. Negative	Direction (-)	19. Ethemet Configuration
Bridge & Pulse	Calibrate		Ethernet Configuration Destination MAC Address
7. Gain Setting	0.000	Capacity 2	Destination IP Address
Gain = 128 (0.0 - 3.5 mV/V)	 Tension 	 Direction 2 	
8. Supply Voltage	Tension	 Direction 2 	Destination Port Number
5 VDC	•		: : : : Source MAC Address
9. Pulses Per Rotation			Source IP Address
360 Pulses			Source Port Number
			<u></u>

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 and USB530 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 and USB530.

ASCII Streaming Output

+0.00000	*****	
+4.14023	rpm N-m	
+0.00000	deg	
+0.00000	KW	
********	*****	
+0.00000	rpm	
+4.82775	N-m	
+0.00000	deg	
+0.00000	КŴ	
********	*****	
+0.00000	rpm	
+4.82775	N-m	
+0.00000	deg	
+0.00000	ĸŴ	
*********	*****	
+0.00000	mom	
	rpm	
+5.56672	N-m	
+0.00000	deg	
+0.00000	KW	
*******	*****	

This is an example of the streaming ASCII output for the USB520 and USB530.

The USB520 and USB530 can output an automatic streaming ASCII output of the current reading.

The ASCII output will turn off when the USB520 or USB530 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 second¹
- Angle Measurement (a): up to 10k pulses per rotation $(\mbox{PPR})^1$
- ¹ Speed = $\Delta a \times 60$ / 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)

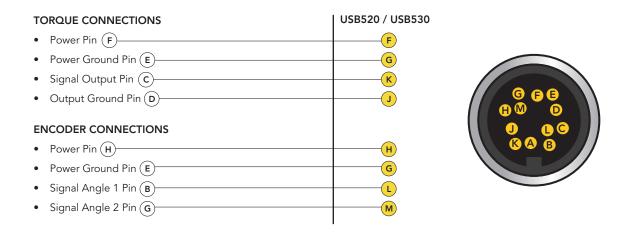
mV/V Wiring Example



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

Amplified Output Wiring Example

TRS605 TO USB520 & USB530 WIRING



Note: Encoder and Torque share the same power ground connection E to G. Encoder connections supported by the USB520/USB530.

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: <u>http://www.futek.com/sensit/support.aspx</u>

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