FUTEK

MODEL USB225

High Speed/High-Resolution Strain Gauge Analog to Digital USB Output Module (Pro and Pro Elite versions)

FEATURES

- USB2.0 device compatible with a USB3.0 port
- Short/Open Circuit and Excessive Temperature Detection
- PT1000 RTD Temperature Measurement (Pro Elite only)
- TEDS Auto-Recognition (Pro Elite only)
- High Resolution and High Sampling Rate Output up to 38,400 SPS[1] for the Strain Gauge mV/V Input
- Supports strain-gauge based sensors (Load, Torque, Displacement and Pressure Sensors)
- Fully Powered over USB
- Streaming ASCII up to 1,200 SPS

MATERIAL & MANUFACTURING

- High-Reliability PCB/Assembly (IPC CLASS III)
- High-Temperature Rated Material/BOM Items
- Strictly Controlled Inspection, Test, and Calibration Process
- Fully Controlled Handling/Packaging Process
- Extensive Test and Validation for 100% of Production Units
- Individual Calibration Report/Certification for Instruments and Systems

APPLICATIONS

- Medical
- Aerospace
- Precision Industrial Automation
- Lab & Field Instrumentation
- Precision Manufacturing

SPECIFICATIONS

GENERAL	
Internal Resolution	32 bits
Output	Digital Packetized Data
On Chip Memory	64 Kb
Weight	0.7 oz (20 g)
Material	Aluminum body/stainless steel cover
IP Rating	IP50
STRAIN GAUGE mV/V INPUT	
Input Range	Up to ± 16 mV/V
Non-Linearity (max)	± 0.002% of FSR[4]
Sampling Rate	Up to 38,400 SPS[1] (see chart)
Bandwidth (Hz)	See Chart
Min/Max Bridge Resistance	87.5 to 5000 Ω
Stored Calibration	Up to 22 points
Bridge Excitation	4.6 VDC
Resolution (Noise Free)	Up to 20 bits (see chart)
Internal Shunt Value	43, 60.4, & 150 kΩ; ± 0.1% Tolerance
POWER	
Supply	Standard USB Bus (5 VDC ± 10%)
Power Consumption	32 mA at 5 VDC (without a sensor connected)
Inrush Current	<500 mA
CONNECTORS	
Mating Connector	Hirose ST40TX-10S-CV(30)
USB 3.0 Connector	USB 3.0 Type A Plug
ENVIRONMENT	
Operating Temperature	-4°F to 175°F [-20°C to 80°C]
Storage Temperature	-40°F to 257°F [-40°C to 125°C]
Temperature Coefficient	±5 ppm/°C
CONFORMITY	
RoHS	2011/65/EU
CE	EN 61326-1:2013, FCC 15.107:2021, FCC 15.109:2021, ICES-003:2020, VCCI-CISPR 32:2016

DSPM Industria sensori & trasduttori
Via Paolo Uccello 4 - 20148 Milano
Tel +39 02 48 009 757 Fax +39 02 48 002 070 info@dspmindustria.it www.dspmindustria.it

ADDITIONAL FEATURES	
LED INDICATORS	
Solid Green	Normal Operation Mode
Blinking Red	Fault Condition Detected (Open, Short or Temperature Exceeded)
Solid Pink	System is logging data
Solid Blue	Bootloader mode is enabled

NOISE FREE RESOLUTION FOR ± 5 mV/V		BANDWIDTH
Sampling Rate	**NFR[3]** (bits)	**Bandwidth** (Hz)
2.5[2]	20	0.58
5[2]	19.2	1.15
10[2]	18.6	2.28
16.6[2]	18.3	3.80
20[2]	18.1	4.63
50[2]	17.5	11.40
60[2]	17.4	13.70
100[2]	17.1	22.80
400[2]	16.2	91
1200[2]	15.3	273
2400	14.6	544
4800	14	1077
7200[1]	13.6	1590
14400[1]	13.3	2940
19200[1]	13.1	3920
38400[1]	11	7740

[1] Sampling Rate Only Available With USB225 Pro Elite

[2] ASCII streaming feature is auto-enabled upon startup. This feature only works for sampling rates up to 1,200 SPS and is auto-disabled for higher sampling rates.

[2] ASCII streaming only supports mV/V scaling/calibration (RTD and TEDS are not supported)

[3] Noise Free Resolution

[4] Nonlinearity calculated at FSR (Full Scale Range) = 5 mV/V

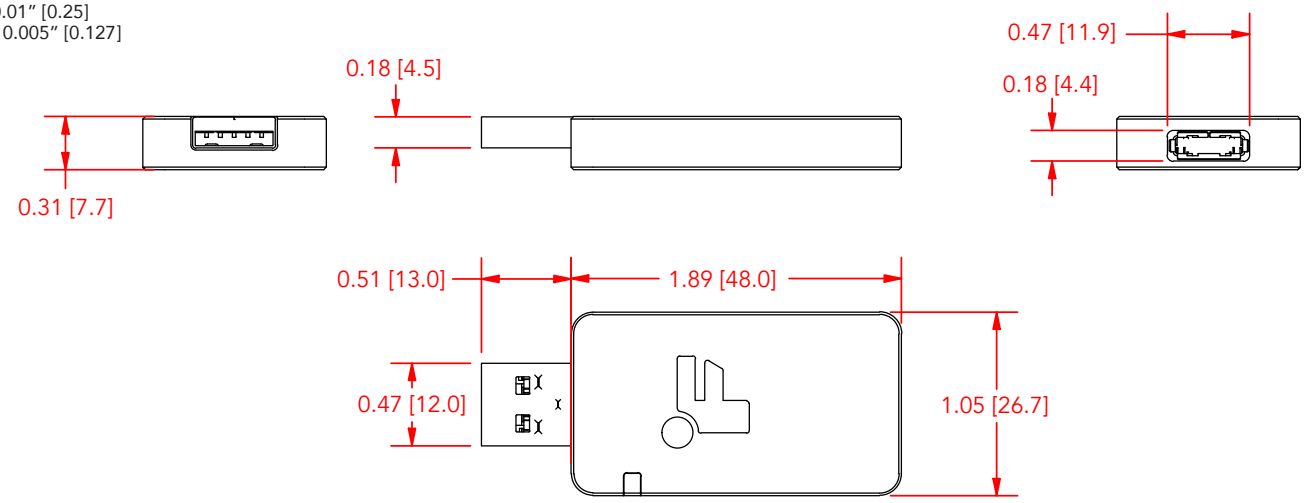
SPECIFICATIONS continued	
TEDS (PRO ELITE ONLY)	
Compatibility	ISO/IEC/IEEE 21451-4:2010/TEDS
Supported TEDS Devices	DS2431, DS24B33, & DS28EC20
Supported Cable Length	Up to 30 ft
Supported Templates	30 and 33
RTD INPUT (PRO ELITE ONLY)	
RTD Precision	±2.5°C (±4.5°F)
RTD Type	PT1000 only
RTD Sampling Rate	10 SPS (fixed)
ASCII PARAMETERS	
Data (Bit)	8
Baud Rate (bps)	2,000,000
Parity	None
Stop (Bit)	1
Flow Control	None
Format	Data, Unit, LF

MODEL COMPARISON		
Feature	**USB225 Pro** (FSH04720)	**USB225 Pro Elite** (FSH04454)
TEDS Input		✓
RTD (PT1000) Input		✓
Fault Detection	✓	✓
Min Sampling Rate (SPS)	2.5	2.5
Max Sampling Rate (SPS)	4,800	38,400

DSPM Industria sensori & trasduttori
Via Paolo Uccello 4 - 20148 Milano
Tel +39 02 48 009 757 Fax +39 02 48 002 070 info@dspmindustria.it www.dspmindustria.it

DIMENSIONS inches [mm]

TOLERANCE:
.X ± 0.1" [2.5]
.XX ± 0.01" [0.25]
.XXX ± 0.005" [0.127]



COMPATIBILITY

System	Notes
Software	Programming Platforms: DLL file available for programing support, such as LabVIEW, Visual Studio, and Xcode.
	Support Operating Systems: Windows 10 and 11.

GENERAL NOTES

- System requires a 5 second startup time.
- USB225 Pro Elite requires an additional system calibration for an accurate RTD reading.

ACCESSORIES

- **Mating Connector included** FSH04651 (ZCO975).
- **FUTEK's SENSIT® Software** (FSH04877, FSH04878)
  14 Day Trial - Available to download on FUTEK website. A license is required, per seat, after 14 days to benefit the features such as data logging, graphing, etc. Trial version turns into basic read-out ONLY after 14 days and a product key is required to enable the features.

Drawing Number: FI1554-A

FUTEK reserves the right to modify its design and specifications without notice. Please visit http://www.futek.com/salesterms for complete terms and conditions.

The information provided herein was developed using FEA analysis, empirical data and multiple testing simulations. FUTEK presents the information in good faith and believes it is correct but makes no representations or warranties as to the completeness or accuracy of the information provided. User's application may produce different data and/or results. By using this information, you agree that you have read and understand this disclosure. Please contact us to discuss your particular application and needs.

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

DSPM Industria® sensori & trasduttori
Via Paolo Uccello 4 - 20148 Milano
Tel +39 02 48 009 757 Fax +39 02 48 002 070 info@dspmindustria.it www.dspmindustria.it