



Ultra-Low-Power Miniaturized Integrable Sampling System



FEATURES

- High-resolution digital strain-gauge measurement
- $\overline{DRDY}$ Pin for precise data-ready synchronization
- Flexible integration: UART or SPI
- Ultra-low power
- Reliable communication with integrated checksum and CRC-8/SMBUS⁵
- On-board temperature measurement
- On-board ESD protection

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 (Available Upon Request)

APPLICATIONS

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

SPECIFICATIONS

GENERAL

Item Number	FSH04942
Profile Storage	1 Profile
Internal Resolution	24 Bits
Stored Calibration	Up to 22 points per profile
Sampling Rate	4 - 1300 SPS (See NFR Table)
Weight	0.466 oz [13.2 g]
Material	Aluminum Enclosure
IP Rating	IP40

STRAIN GAUGE MV/V INPUT

Input Range	Up to ± 480 mV/V
Excitation Voltage	2.5 VDC
Min/Max Bridge Resistance	350 to 5000 Ω
Non-linearity (max) ¹	$\pm 0.01\%$ of FSR
Resolution (Noise Free)	Up to 18.4 bits (See NFR Table)

DIGITAL OUTPUT (UART)

Data Length (Bit)	8
Baud Rate (bps)	320,000
Parity	None
Stop (Bit)	1
Flow Control	None
Voltage Level	2.5 VDC (Compatible with 3.3 VDC)
Max Cable Length ²	6 m [19.7 ft]

DIGITAL OUTPUT (SPI)

Serial Word Length (Bit)	8
SPI Mode	Mode 0 (CPOL = 0, CPHA = 0)
SCLK Frequency	1 MHz - 2 MHz
Operating Mode	Client
Voltage Level ³	1.8 VDC (Compatible with 3.3 VDC)
Max Cable Length ²	20 cm [7.9 in]

CONNECTORS

Mating Connector	FSH04801 (J4) & FSH04802 (J2)
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SPECIFICATIONS (CONTINUED)	
POWER	
Supply ⁴	3 to 5 VDC
Power Consumption (no load)	45 mW (Max)
Power Consumption (350 Ω Bridge)	85 mW (Max)
Inrush Current	180 mA (Max)
ENVIRONMENT	
Operating Temperature	-13°F to 185°F [-25°C to 85°C]
Storage Temperature	-13°F to 185°F [-25°C to 85°C]
Temperature Stability/Drift	10 ppm/°C of FSR
CONFORMITY	
RoHS	2015/65/EU

General Notes:

- ¹ Non-linearity calculated at Full Scale Range (FSR) of 2 mV/V and gain of 128
- ² The stated maximum cable lengths are the recommended configurations under which device performance has been validated. These values are based on testing conducted using shielded, properly terminated cables under controlled operating conditions. Customers may use cable lengths exceeding the recommended values at their own discretion; however, system performance, signal integrity, and communication reliability beyond the specified lengths are not guaranteed and remain the responsibility of the user. In addition, the stated limits may not apply in environments with strong magnetic or electrical interference.
- ³ The QIA128/IDC150/IEM100 (client device) operates on a 1.8 VDC logic level and is compatible with logic levels up to 3.3 VDC, allowing for direct connection. If the host device's input threshold for logic high (VIH) supports 1.8 VDC, no additional hardware or considerations are required. Otherwise, a level shifter may be necessary to ensure proper communication.
- ⁴ 20 – 40mV peak-to-peak ripple in passband and 20MHz bandwidth (cutoff 40dB @ 20MHz)
- ⁵ Refer to the QIA128/IDC150/IEM100 UART and SPI communication guides

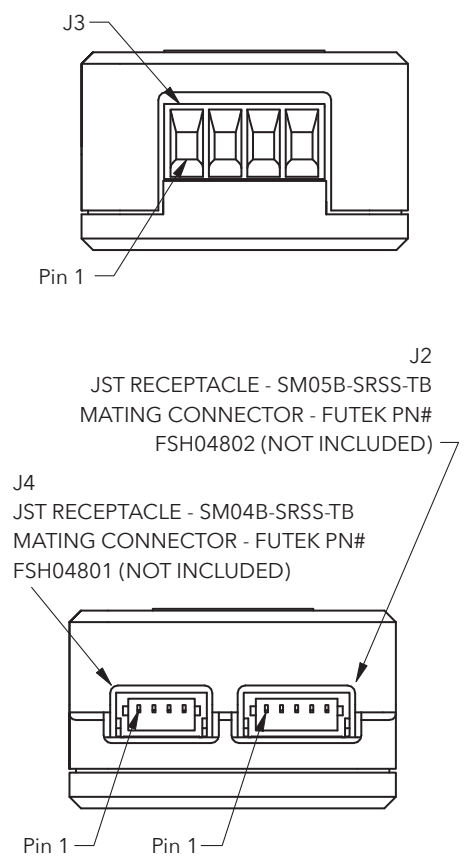
Active low $\overline{\text{DRDY}}$ pin is used to keep all communication synchronized

All Grounds are internally connected.



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WIRING CODE FSH04942



SENSOR CONNECTOR J3

PIN	FUNCTION	DESCRIPTION	COLOR
1	+ EXCITATION	Sensor excitation output.	RED
2	- EXCITATION	Sensor excitation return, internally connected to GND.	BLACK
3	+ SIGNAL	Sensor positive input.	GREEN
4	- SIGNAL	Sensor negative input.	WHITE

UART CONNECTOR J4

PIN	FUNCTION	DESCRIPTION
1	TX	UART transmit data output.
2	RX	UART receive data input.
3	GND	Ground. All ground pins are internally connected.
4	VIN	Supply input, 3 to 5 VDC.

SPI CONNECTOR J2

PIN	FUNCTION	DESCRIPTION
1	$\overline{\text{DRDY}}$	Active low data ready output ⁶
2	HOCi	SPI Host Out Client In data line.
3	HICO	SPI Host In Client Out data line.
4	SCLK	SPI serial clock input from host.
5	$\overline{\text{CS}}$	Active low chip select input. Do not assert $\overline{\text{CS}}$ low until the device has completed boot. Do not assert $\overline{\text{CS}}$ low unless $\overline{\text{DRDY}}$ is low.

⁶Indicates new sampled data is available and keeps host communication synchronized. $\overline{\text{DRDY}}$ goes low when data is ready to be clocked out and may be used as a host interrupt. DRDY is high during conversion and returns low when new data is available. Note: DRDY does not return high after data is read. It returns high only when the system enters a conversion state.

NOISE-FREE RESOLUTION

RANGE (mV/V)	GAIN	4 SPS (Default)	20 SPS	50 SPS	100 SPS	200 SPS	500 SPS	850SPS	1300 SPS
240-480	1	18.4	17.7	16.7	16.3	15.8	15.2	14.6	14.2
120-240	2	17.1	16.8	15.8	15.3	14.9	14.2	13.9	13.3
60-120	4	16.9	16.7	16.5	16.3	16.0	15.0	14.9	14.1
30-60	8	16.8	16.4	16.3	16.1	15.6	15.1	14.8	13.8
15-30	16	16.7	16.3	16.2	16.0	15.5	15.2	14.7	13.7
7.5-15	32	16.6	16.2	16.1	15.9	14.9	14.7	14.6	13.5
3.7-7.5	64	16.5	16.1	16.0	15.8	15.7	15.2	14.5	13.4
1.8-3.7	128 (Default)	16.1	15.6	15.5	15.1	14.7	14.0	13.8	13.2
0.9-1.8	256	15.1	14.7	14.1	13.5	13.3	13.1	12.6	12.2
0-0.9	512	14.0	13.6	13.5	13.1	12.8	12.1	11.8	11.4

Noise Free Resolution is calculated using upper limit of "Range (mV/V)" or "maximum dynamic range"



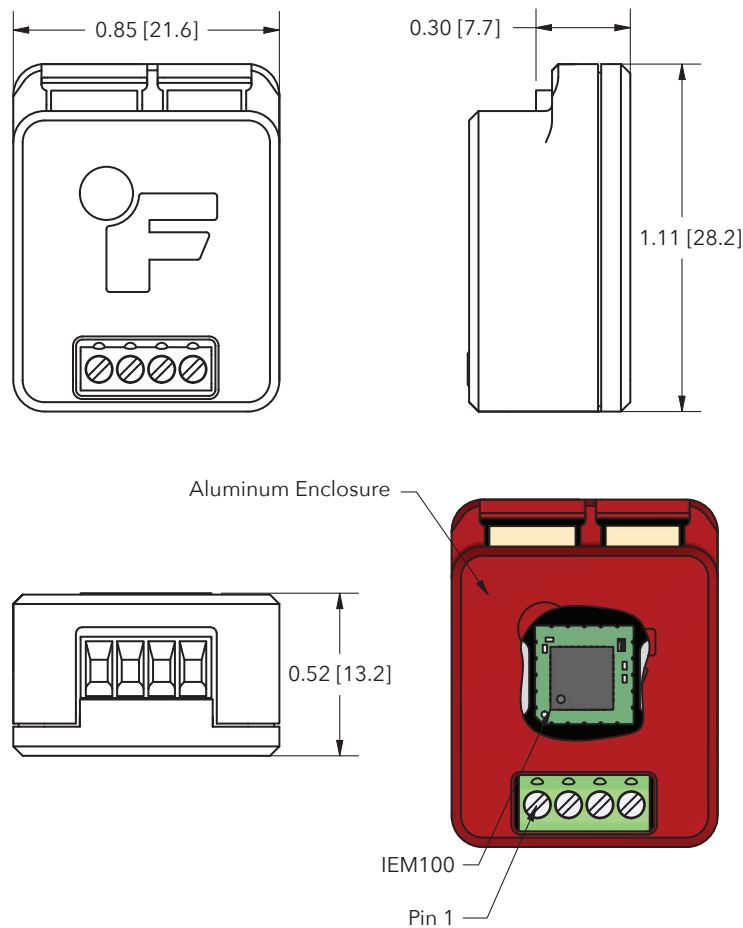
RoHS



U.S. Manufacturer

Ultra-Low-Power Miniaturized Integrable Sampling System

DIMENSIONS inches [mm]
FSH04942



Drawing Number: FI1586

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