24-bit Analog to Digital (ADC)

Manufacture Part No.	GYRHX711-1

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Published on 01.04.2024

Gyrfalcon IntelliEdge Solutions
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24-Bit Analog-to-Digital Converter (ADC) for Weigh Scales

HX711 Dual-Channel 24 Bit Precision LOAD AMPLIFIER

Description

This module is a precision 24-bit analog-to-digital converter (ADC) crafted for weigh scales and industrial control applications like A/D weight pressure sensor, Pressure, Force and Flex sensor. Tailored to interface directly with bridge sensors, its input multiplexer allows selection between Channel A and B, each offering specific gains. Channel A, programmable with gains of 128 or 64, corresponds to ±20mV or ±40mV full-scale differential input voltage when connected to a 5V supply. Channel B features a fixed gain of 32. With a low-noise programmable gain amplifier, on-chip power supply regulator, and flexible clock input from external sources, crystals, or an on-chip oscillator, the HX711 excels in delivering precise measurements without the need for external components. The integrated power-on- reset circuitry simplifies digital interface initialization, making it an ideal choice for applications demanding accuracy, reliability, and ease of integration.

Features

HX711

- Two selectable differential input channels Channel A and Channel B • On-chip active low noise PGA (Programmable Gate Array) with selectable gain of 32, 64 and 128
- On-chip power supply regulator for load-cell and ADC (Analog to Digital Converter) analog power supply
- On-chip oscillator requiring no external component with optional external crystal
- On-chip power-on-reset
- Simple digital control and serial interface: pin-driven controls, no programming needed
- Selectable 10SPS (Samples per second) or 80SPS output data rate
- Simultaneous 50 and 60Hz supply rejection
- Current consumption including on-chip analog power supply regulator: normal operation
- <1.5mA, power down < 1uA
- Operation supply voltage range: 2.6 ~ 5.5V
- Operation temperature range: -40 ~ +85°C

Module

- Single input Channel A
- Channel A resolution 64 or 128 bits
- Operation supply voltage range: 2.6 ~ 5.5V
- Operation temperature range: -40 ~ +85°C

Pin Description

SOP-

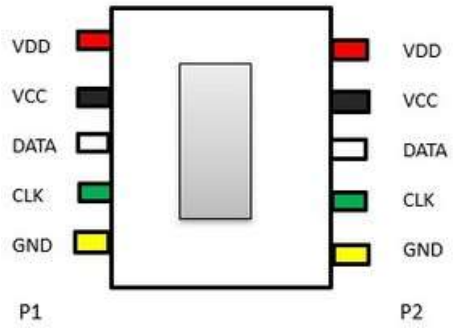


Figure: Pin Diagram

10L Package

Table-1 P1 Pin Description

Pin #	Name	Function	Description
1	VDD	Power	Regulator supply: 2.6 ~ 5.5V
2	VCC	Ground	Voltage Common collector
3	DATA	Analog Input	Channel A negative input
4	CLK	Analog Input	Channel A positive input
5	GND	Ground	Ground

Table-2 P2 Pin Description

Pin #	Name	Function	Description
1	VDD	Power	Regulator supply: 2.6 ~ 5.5V
2	VCC	Ground	Voltage Common collector
3	DATA	Digital Output	Serial data output
4	CLK	Digital Input	Power down control (high active) and serial clock input
5	GND	Ground	Ground

Applications

Weigh Scales
Industrial Process Control
Load Monitoring Systems Material testing and research Automated Dispensing System
Fitness and Sports Equipment

Table 3 Key Electrical Characteristics

Parameter	Notes	MIN	TYP	MAX	Unit
Full scale differential Input range	$V_{(inp)}$ $V_{(inn)}$		± 0.5(AVDD/GAIN)		V
Common mode input			GND+1.2 VDD-1.3		V
Output data rate	Internal Oscillator, RATE = 0		10		Hz
	Internal Oscillator, RATE = VDD		80		
	Crystal or external clock, RATE = 0		fclk/1,105,920		
	Crystal or external clock, RATE = VDD		fclk/138,240		
Output data	2'scomplement	800000		7FFFFF	HEX
Output settling time(1)	RATE = 0		400		ms
	RATE = VDD		50		
Input offset drift	Gain = 128		0.2		mV
	Gain = 64		0.4		
Input Noise	Gain = 128, RATE = 0		50		nV(rms)
	Gain = 128, RATE = VDD		90		
Temperature drift	Input offset (Gain = 128)		±6		nV/°C
	Gain (Gain = 128)		±5		ppm/°C
Input common mode rejection	Gain (Gain = 128)		100		dB
Power supply rejection	Gain = 128, RATE = 0		100		dB
Reference bypass (V_{BG})			1.25		V
Crystal or external clock frequency		1	1 1.0592	20	MHz
Power supply voltage	VDD	2.6		5.5	V
Analog supply current (Including regulator)	Normal		1400		uA
	Power down		0.3		
Digital supply current	Normal		100		uA
	Power down		0.2		

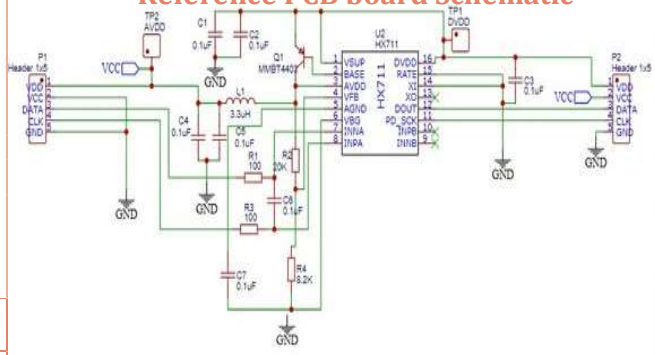
Abbreviations in Table 3

$V_{(inp)}$ - Inverting Input Voltage

$V_{(inn)}$ - Non- Inverting Input Voltage

V_{BG} - Voltage Band Gap

Reference PCB board Schematic



Package Description