

iLoad Mini™ Load Cell

Aluminum

The iLoad Mini Series aluminum load cell is designed for applications where size and cost are major constraints. The iLoad Mini is only 1.25” in diameter and outputs a 5V TTL square wave whose frequency is proportional to applied loads.

Highlights

Capacitive Load Cell Technology

- Simplifies load measurements
- Standard 5V DC input
- 5V TTL frequency output
- Temperature compensated

Integrated Load Cell Electronics

- Large signal to noise ratio
- Saves space & reduces clutter

Rugged & Reliable

- Aluminum construction
- Mechanically robust design
- Weather-resistant packaging

Easy Attachment

- Convenient mounting on top and bottom of sensor
- Self balancing three point support on base
- Optional Tension Adapter available

Multiple Load Cell Capacities

- iLoad Mini 10 pounds
- iLoad Mini 50 pounds
- iLoad Mini 100 pounds
- iLoad Mini 200 pounds

Can be used in compression or tension

Available Interfaces

- DQ-1000A
- DQ-1000U

Overview

Loadstar’s iLoad Mini load cell is based on the same *capacitive technology* as the iLoad and iLoad Pro sensors. However, it differs in one important respect—the Mini outputs a square wave whose frequency is proportional to the applied load. The Mini, the smallest sensor currently offered by Loadstar Sensors, is a small circular sensor with a diameter of just 1.25 in. and is available with either a threaded stud or a load button on top of the sensor. It has three threaded holes on the bottom of the sensor to easily mount the sensor with commonly available hardware.

Unlike conventional resistive load cells based on either strain gauges or piezo-resistive techniques, Loadstar’s breakthrough patented technology harnesses changes in capacitance to measure loads quickly and accurately. In the Mini, the change in capacitance is converted into a change in frequency of the output signal.

The sensor accepts a 5V DC input and outputs a TTL square wave whose frequency is proportional to the applied load. Most data acquisition systems, microprocessors and microcontrollers have the capability to measure the frequency of the signal.

The iLoad Mini load cell has 2 frequency outputs. When Control Input = logic ‘1’, the Mini outputs the sensor frequency, F_{sensor} . When Control Input = logic ‘0’, the Mini outputs the reference frequency, F_{ref} . The compensated frequency $F_{\text{comp}} = F_{\text{sensor}} - K * F_{\text{ref}}$, where K is a constant provided by Loadstar. Loadstar provides the coefficients for the quadratic equation to translate F_{comp} to load.

If one wants an analog (0.5V—4.5V or 2mV/V) or digital USB output from the iLoad Mini the [DQ-1000A](#) or [DQ1000U](#) are available as options.

Load Sensing Made Easy!



Precise
Accuracies to 1% of full scale.



Rugged
Aluminum construction.
Environmentally protected.



Integrated Electronics
Easily measured 5V frequency signal output. Available interface for USB or analog output.



Easy Mounting
Threaded mounting holes for easy attachment using standard hardware.



Suggested Configuration

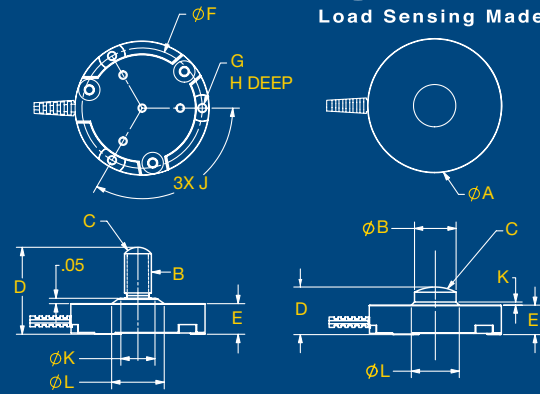


iLoad Mini Load Cell

Aluminum

Dimensions	Domed Top				Threaded Stud		
	10 lb.	50 lb.	100 lb.	200 lb.	10 lb.	50 lb.	100 lb.
A	1.25				1.25		
B	Ø 0.394				#10-32 UNF-2A	¼-28 UNC-2A	
C	R 0.41				R 0.094	R 0.160	
D	0.46				0.81		
E	0.285				0.285		
F	1.120				1.120		
G	#2-56 UNC-2B				#2-56 UNC-2B		
H	0.20				0.20		
J	120°				120°		
K	0.394	0.394	0.394	0.394	0.19	0.32	0.32
L	0.394	0.450	0.454	0.454	0.390	0.505	0.49

All dimensions are in inches unless specified otherwise.



Load Cell Specifications

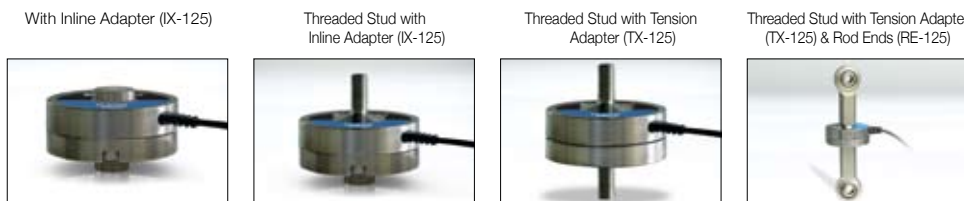
Accuracy w/tare (% of FS)	Non-linearity	Hysteresis	Non-repeatability
10, 50, 100, 200 lb.	±1 %	±1 %	±1 %
Response Rate	10 Hz		

Mechanical	
Safe Overload	to 150% of capacity
Deflection	0.002-in at capacity typical
Sensor Size	1.25 OD, for height see table above

Electrical	
Input Power	Regulated 5V at 60 mA
Output	5V TTL variable frequency signal when Control = 1, Frequency Output = F_{sensor} when Control = 0, Frequency Output = F_{ref} $F_{\text{comp}} = F_{\text{sensors}} - K * F_{\text{ref}}$ Compensation factor K provided by Loadstar
Connections	Integrated 6 ft. cable with pigtail for terminal attachment or 5 pin male USB mini-B Connector

Environmental	
Creep, in 20 min	±0.03 % of full scale
Operating Temperature Range	10°C to 40°C, non-condensing
Temperature Effect on Span	up to ±0.05 % full scale/°C (from calibration temperature)

Alternative Load Cell Configurations



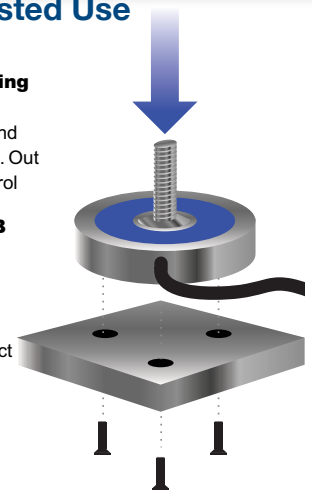
Suggested Use

Pigtail Wiring

- Red - 5V DC
- Black - Ground
- Green - Freq. Out
- White - Control

USB Mini-B Pinout

1. 5V DC
2. Control
3. Freq. Out
4. No Connect
5. Ground



The load cell is circular with a dome or threaded stud (see outline) on top. The flat bottom surface has three slightly stepped areas 120° apart with mounting holes tapped to accept #2-56 screws. Mount the load cells on a flat surface and apply loads perpendicular to the sensor body. Off-center or laterally-applied loads will reduce accuracy. Avoid side loads and twisting loads. Use under steady temperature conditions for best results.

Certificates



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