

# iLoad Mini™ Load Cell

## Stainless Steel

The iLoad Mini Series load cell is designed for applications where size is a major constraint. 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

- Stainless steel 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,  $F^{\text{sensor}}$ . When Control Input = logic '0', the Mini outputs the reference frequency,  $F^{\text{ref}}$ . 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  $F^{\text{comp}}$  to load.

If one wants an analog (0.5 V– 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 0.5% of full scale.



**Rugged**  
Stainless steel 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

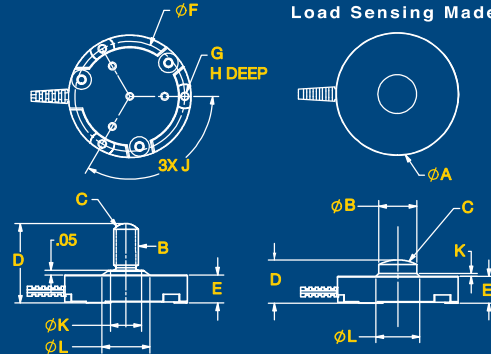
Stainless Steel

Domed Top

Threaded Stud

Dimensions	10 lb.	50 lb.	100 lb.	200 lb.	10 lb.	50 lb.	100 lb.	200 lb.
A	1.25				1.25			
B	Ø 0.270				#10-32 UNF-2A   ¼-28 UNC-2A			
C	R 0.41				R 0.094   R 0.160			
D	0.394				0.81			
E	0.285				0.285			
F	1.12				1.12			
G	#2-56 UNC-2B				#2-56 UNC-2B			
H	0.20				0.20			
J	120°				120°			
K	0	0	0.02	0.055	0.27	0.30	0.32	
L	0.27	0.27	0.47	0.47	0.27	0.40	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.	±0.5 %	±0.5 %	±0.5 %
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

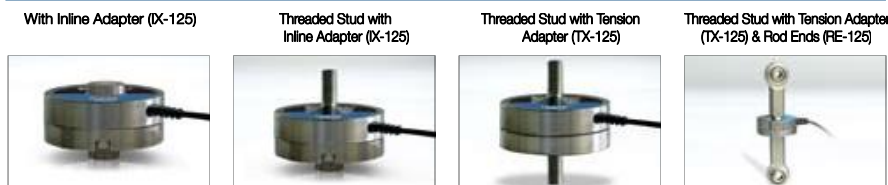
### Electrical

Input Power	Regulated 5V at 60 mA
Output	5V TTL variable frequency signal when Control = 1, Frequency Output = $F_{\text{sensor}}$ when Control = 0, Frequency Output = $F_{\text{ref}}$ $F_{\text{comp}} = F_{\text{sensors}} - K * F_{\text{ref}}$ 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



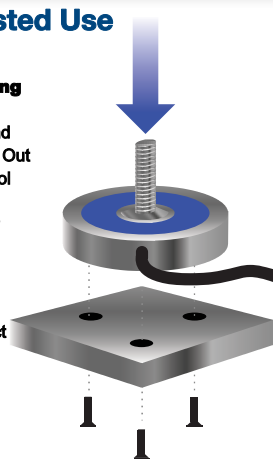
## Suggested Use

### 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.

## Certifications



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