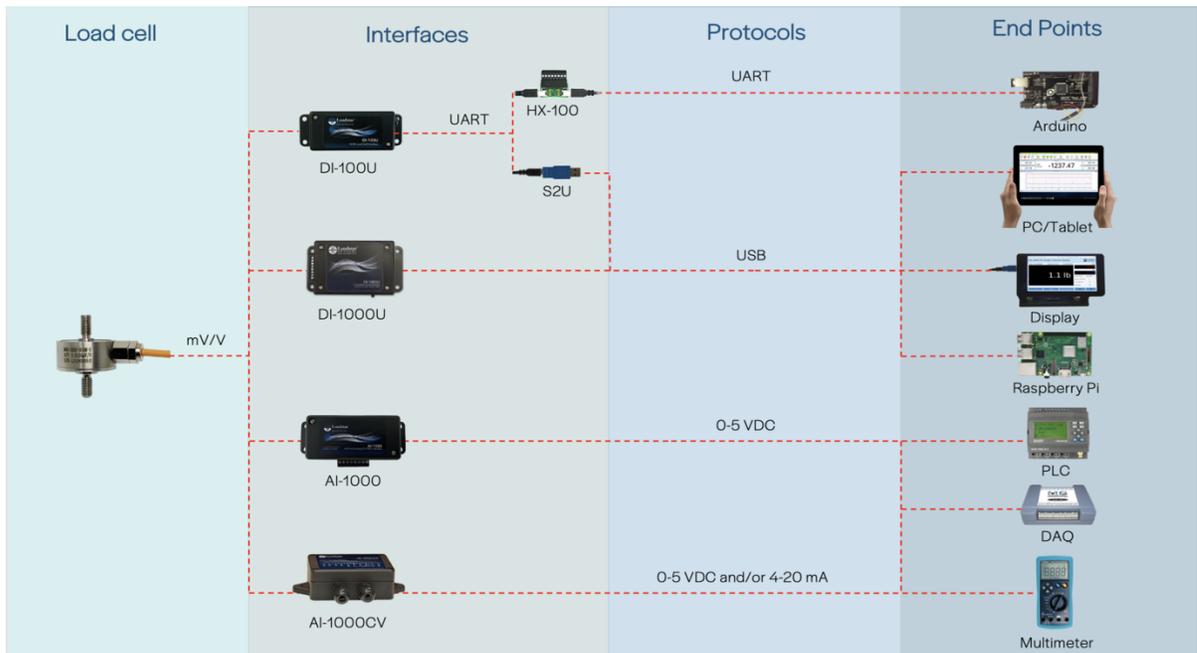


Sensor Only or Interface Only Purchase

A note to customer

By [Div Harish](#)



Loadstar Sensors Interface Options

Sensor with Interface Device/Signal Conditioner?

Sensors generally are analog devices with an electrical output. The output is usually a change in voltage (mV/V), frequency, or current. When a user wants to connect a sensor to a PC, PLC, Tablet, SmartPhone or an LED/LCD display, a sensor interface device or signal conditioner is needed.

What is an Interface Device for Load Cells?

Load cells can be mated with an interface device to make it easy to connect with a PC or a PLC. Our DI-100U, the DI-1000U and DI-400U series of interfaces make it easy for users to connect with a PC via USB. There are versions of DI-1000 available for wireless connections as well.

The AI-1000 interface allows a load cell to be connected with a PLVC via a voltage signal (0.5 to 4.5V DC. The AI-1000-CV interface allows a user to connect to a PLC via a 0.5 to 4.5V DC voltage output or a 4-20 mA current output or both.

**The Load Cells MUST be calibrated
with an interface before they can be used together**

Why do they need to be Calibrated?

Load Cells are sensors with low level analog outputs. Interfaces take in this analog output and convert it into a digital or higher level analog output compatible with a PC or a PLC. But for this to make sense physically in units such as Lb, kg, N etc. one has to “calibrate” them by applying known forces and measuring the sensor output and calculating the best fit curves that can be used to interpret results from the sensor in known physical quantities.

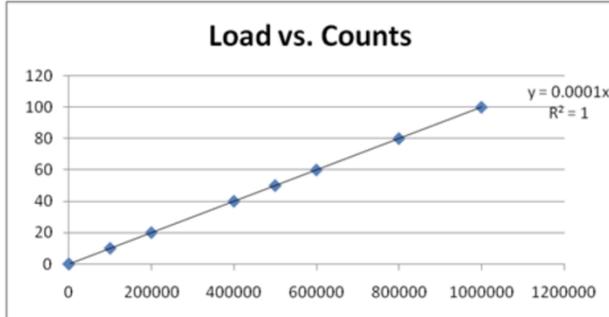
Options for Calibration?

You can either calibrate it yourself before using the sensor and/or the interface or send it in to us for calibration service.

Sending it to us for Calibration

We use NIST traceable calibration equipment to calibrate your sensor and interface and ship it back to you for a very reasonable fee. Some sample digital and analog calibration is shown below.

Sample Digital Calibration



Capacity: 100lb.	
Load	Raw Counts
0	5000000
10	5100000
20	5200000
40	5400000
60	5600000
80	5800000
100	6000000
50	5500000
0	5000000

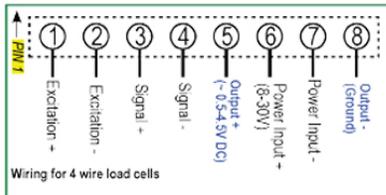
Known Forces vs. Raw Digital Output

Using NIST traceable dead weights or equipment, we apply known weights and gather raw digital data and fit a best fit cubic curve to calculate the calibration coefficients

Burnt into the Interface

The calibration coefficients are burnt into the Digital Interface and stored in it

Sample Analog Calibration



Capacity: 100lb.	
Load (Lbs)	Raw Signal (V)
0	0.500
10	1.000
20	1.500
40	2.000
60	2.500
80	3.000
100	4.000

Known Forces vs. Raw Analog Output

The amplifier is used to amplify the low level signal into a high level signal by adjusting potentiometers on the device. Using NIST traceable dead weights or equipment, we apply known weights and gather raw analog voltage data and fit a best fit linear curve to calculate the calibration coefficients

Analog Calibration

The calibration certificate shows the lb/voltage value or the lb/ampere so that a user can measure just the voltage or current and multiply it by the scaling factor to obtain calibrated values

DIY Digital Calibration

If you want to do it yourself, then you need to have our Calibration utility available in our LoadVUE Pro, SensorVUE and ControlVUE software.

Calibrate Sensor

Specifications **mV/V Calibration** 2-Point Calibration Multi-Point Calibration Verify Calibration

Port Number: COM8 DI-1000 Firmware Ver: 6.0 20150828

Sensor Parameters

ID: REF-RSP1-50KG (Enter a unique string to identify this unit, 12 char max.)

Displacement sensor IDs must start with "DISP-", torque sensor IDs with "TQ-" and pressure sensor IDs with "PR-".

Calibration Units: LB Sensor Capacity: 100.00 LB

Loading Direction (Not supported for firmware v 110 or for mVolt calibrations)

Loading direction is applicable only if you are calibrating a load cell. Otherwise ignore.
Also not applicable for mVolt calibration.

Select... **Compression Only**

Gain: 64 Load Cell: 64
Displacement Sensor: 1

Please contact us if you do not have this software. You will need to purchase a copy of at least the LoadVUE Pro Software to calibrate and test one sensor at a time. Or buy SensorVUE to calibrate and test and display multiple calibrated load cell + interface pairs at a time.

DIY Analog Calibration

If you want to do it yourself, then you need to have access to a good 6 digit voltmeter and/or an ammeter and a good power supply (or use the one we provided with your order)

You have to adjust the potentiometers on the AI-1000 or the AI-1000-CV to adjust the offset (zero level output to be close to 0.5 VDC or 4 mA) and then the scale (to make sure the output at full load is 4.5 VDC or 20 mA).

Then apply known loads and gather data from zero to full scale and then fit a best fit linear curve to calculate the values of lb/volt or lb/mA. Then you can use this in your own DAQ or PLC to calculate the applied loads as measured by the load cell.

“Please note that once calibrated the Sensor and Interface pair MUST be used together. They cannot be used interchangeably”

— [Div Harish](#)