Dual Load Cell Amplifier
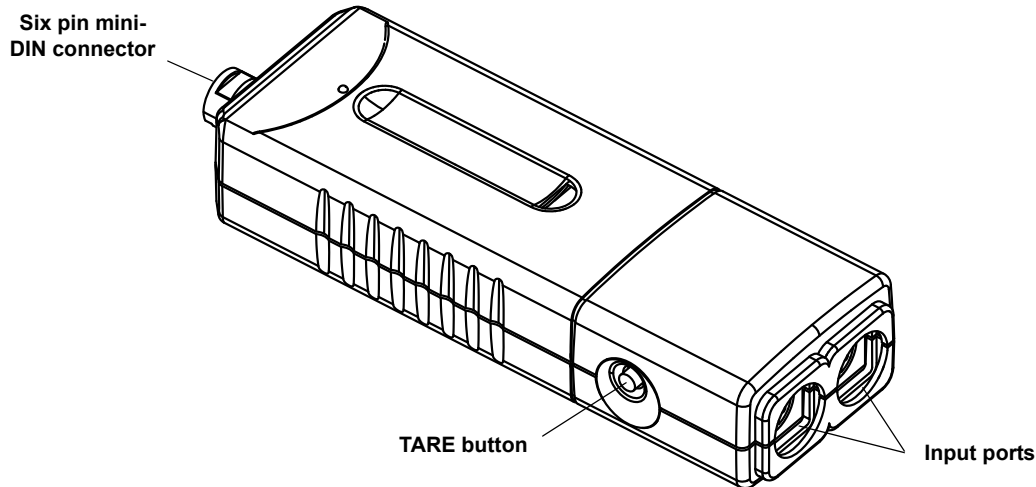
PS-2205

Included Equipment	Part Number
Dual Load Cell Amplifier	PS-2205
Compatible Sensor	
Load Cell, 100 N	PS-2200
Load Cell, 5 N	PS-2201
Recommended Items	
PASPORT Extension Cable	PS-2500
Truss Set	ME-6990
Bridge Set	ME-6991
Advanced Structures Set	ME-6992

See the PASCO catalog or web site at www.pasco.com for compatible PASPORT interfaces.

Introduction

The PASPORT Dual Load Cell Amplifier works with one or two Load Cells and a PASPORT interface to collect multiple streams of tension or compression force data. Individual Load Cells (available separately) can be connected to the two input ports.

The Dual Load Cell Amplifier can be connected to any PASPORT interface. One amplifier can be connected to a single USB Link or Xplorer. Up to three amplifiers can be connected to a PowerLink, and up to four amplifiers can be connected to the Xplorer GLX datalogger.

Usage

The Dual Load Cell Amplifier and the Load Cells that connect to it are designed measure the tension or compression in beams from the PASCO Structures Syste (See the PASCO catalog online at www.pasco.com for information.)
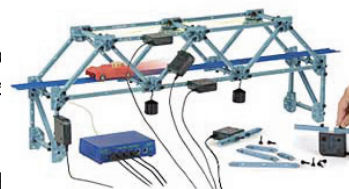
Typical usage is to replace an element in a truss or bridge or other structure with smaller elements joined to a Load Cell that is connected to a Dual Load Cell Ampl... fier that is connected to a PASPORT interface. The PS-2200 Load Cell's range is from -100 N to +100 N. The PS-2201 Load Cell's range is from -5 N to +5 N.

PASCO Structures System

About the Load Cell Amplifier

The Dual Load Cell Amplifier has a 16-bit analog-to-digital converter for a theoretical maximum resolution of 0.003 N when a PS-2200 Load Cell, 100 N is connected or 0.001 N when a PS-2201 Load Cell, 5 N is connected. The amplifier is lightweight and travels easily when connected to a hand-held datalogger such as the Xplorer or Xplorer GLX.

Load Cells can be connected to the Dual Load Cell Amplifier in any order. The maximum sampling rate is the same whether one or two Load Cell are connected.
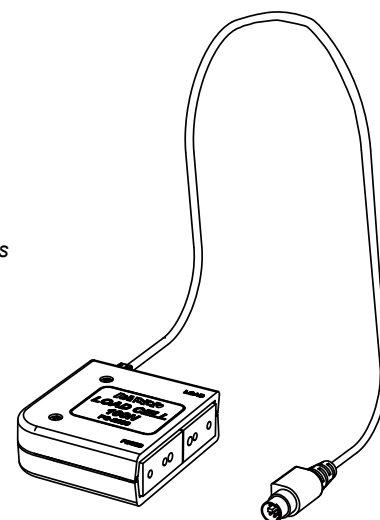
Setup

Hardware Setup

The following three steps can be performed in any order.

1. Connect one or two separate Load Cells (PS-2200) to the individual input ports of the sensor box.

Load Cells can be connected to either port in any order. The connector on the Load Cell cable fits into the sensor box in only one way.

2. Connect the Dual Load Cell Amplifier to a PASPORT interface.

3. If you will be using a computer, connect the PASPORT interface to the computer's USB port.

DataStudio Setup

If you will be using the Dual Load Cell Amplifier with a computer, install the latest version of DataStudio first. Check the PASCO web site at www.pasco.com for information.

1. When you connect the Dual Load Cell Amplifier to the computer through a PASPORT interface, the PASPortal window will launch automatically (if DataStudio is not already running).

2. Select *Launch DataStudio* in the PASPortal window.

A Digits display for force will open automatically.

3. Click [▶ Start] to begin data collection.

To view and change the sample rate and other sensor properties, click [▭ Setup] .

Load Cell

PASCO ®
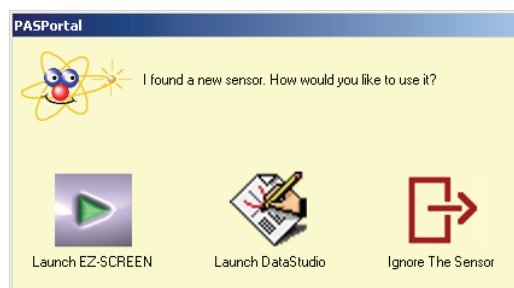
Xplorer and Xplorer GLX Setup

If you will be using an Xplorer or Xplorer GLX in logging mode (not connected to a computer), connect the Dual Load Cell Amplifier to the Xplorer or Xplorer GLX, turn the interface on, and press ⊙ to begin data collection.

SPARK Setup

- If the SPARK Science Learning System (SLS) is off, press and hold the power button on the bottom to turn it on and then wait for the SPARK to boot up. The screen will show a message to plug in a sensor.

- Connect the PASPORT sensor to either of the ports on the top of the SPARK. The screen will show the list of quantities measured by the connected sensor.

Graph Display (default)

To open a graph display, touch any quantity in the list and then touch SHOW to open PAGE 1. Touch the right arrow next to PAGE 1 to go to the next display (digits). Touch the **Start** button to begin collecting data.
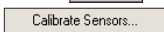
Select a Display

To set up a particular display (e.g., digits display), touch BUILD. Touch a quantity from the list, and then touch one of the display icons. Touch OK to open the display, and then touch the **Start** button to begin collecting data.

Measurement Alignment

When you are using multiple Load Cells, you may find that their readings differ slightly when they are measuring the same thing. Before putting the Load Cells into a bridge, truss, or other structure, press the "TARE" button on the side of the Dual Load Cell Amplifier to "zero" the reading of each of the Load Cells.

No calibration should be necessary for the PASCO Load Cells connected to the Dual Load Cell Amplifier. The following description outlines the procedure for a one point simultaneous calibration using DataStudio.

spark ⠏⠒
TO BEGIN
COLLECTING DATA
PLUG IN A SENSOR

Start button

See the User's Guides for the Xplorer GLX or the SPARK Science Learning System for calibration instructions.

1.   Click [⎯ Setup] to open the Experiment Setup window. Click
     [Calibrate Sensors...] to open the calibration dialog box.

2.   From the Sensor field, select the Load Cell Amplifier.

3.   Select the "Calibrate all similar measurements simulta-
     neously" option.

4.   Arrange all of the Load Cells so that the same amount of mass
     is hanging from each Load Cell.

5.   Observe the Present Sensor Measurement and wait until it has
     stabilized.

6.   From the Calibration Type menu, select 1 Point (Adjust Off-
     set Only).

7.   Click the Read From Sensor button for Point 1.

8.   Click OK to accept the new calibration; or click Cancel to
     revert to the previous or default calibration.
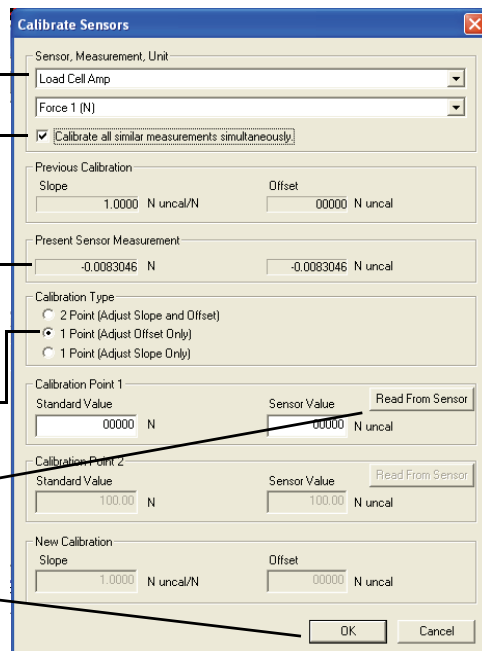
Oversampling

Oversampling occurs at low sampling rates when several measurements are recorded
and averaged over a short interval of time and the averaged value is displayed. The
degree of oversampling that takes place within the Dual Load Cell Amplifier depends
on the sample rate. For example, for a sample rate less than or equal to 2 Hz, the num-
ber of samples counted and averaged is 255.

| Sample Rate	Samples Counted
≤ 1Hz	255
≤ 5Hz	128
≤ 10Hz	64
≤ 20Hz	32
≤ 100 Hz	16
≤ 200 Hz	8
> 200 Hz	1

Specifications

Measurement Ranges	± 100 N*
Accuracy	±1%
Resolution	0.003 N
Maximum Sample Rate	1000 Hz
Differential input voltage for any load cell	± 9.96 mV

Pinouts

Following are the pin assignments for the six-pin mini-DIN jacks. The jack has two
pins dedicated to sensing the range of the PASCO Load Cell connected to it: Range
Select 1 and Range Select 2.

Pin	Signal
1	+ Strain Gauge Output
2	+4.2 V
3	- Strain Gauge Output
4	Ground
5	Range Select 1
6	Range Select 2

Range Select 1	Range Select 2	Range
ground	ground	± 5 N
open	ground	± 100 N
ground	open	± 1,000 N
open	open	no cell connected
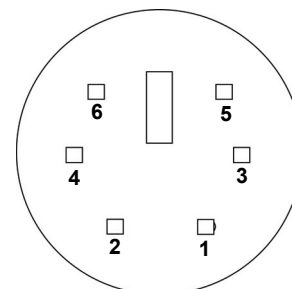
The condition of the signal coming from a load cell on pins 5 and 6 determine how the DataStudio program recognizes the range of the load cell that is attached. If you are using a non-PASCO load cell, then either or both Range Select pins of the load cell must be connected to ground in order for the Dual Load Cell Amplifier to report a load cell reading.

Load cells with other ranges such as ± 1,000 N may be available in the future. Check the PASCO web site for further information.

Technical Support

For assistance with any PASCO product, contact PASCO at:

Address:	PASCO scientific 10101 Foothills Blvd. Roseville, CA 95747-7100
Phone:	916-786-3800 (worldwide) 800-772-8700 (U.S.)
Fax:	(916) 786-3292
Web:	www.pasco.com
Email:	support@pasco.com

For more information about the Dual Load Cell Amplifier and the latest revision of this Instruction Sheet, visit:

www.pasco.com/go?PS-2205

Patents Pending The following PASCO products have patents pending**:**

ME-6990 Truss Set	PS-2198 Load Cell Amplifier
ME-6991 Bridge Set	PS-2199 Load Cell and Amplifier Set
ME-6992 Advanced Structures Set	PS-2200 100 N Load Cell
ME-6995 Road Bed Spares	PS-2201 5 N Load Cell

Product End of Life Disposal Instructions:

This electronic product is subject to disposal and recycling regulations that vary by country and region. It is your responsibility to recycle your electronic equipment per your local environmental laws and regulations to ensure that it will be recycled in a manner that protects human health and the environment. To find out where you can drop off your waste equipment for recycling, please contact your local waste recycle/disposal service, or the place where you purchased the product.

The European Union WEEE (Waste Electronic and Electrical Equipment) symbol (to the right) and on the product or its packaging indicates that this product **must not** be disposed of in a standard waste container.