

PASCO UI-5220 Expansion Board



# PASCO UI-5220 Expansion Board Instruction Manual

[Home](#) » [PASCO](#) » PASCO UI-5220 Expansion Board Instruction Manual 

## Contents

- 1 PASCO UI-5220 Expansion Board
- 2 Introduction
- 3 Components
- 4 Features
- 5 Inputs and outputs
- 6 Digital I/O ports
- 7 Analog ports
- 8 Limited warranty
- 9 Documents / Resources
  - 9.1 References

# PASCO

PASCO UI-5220 Expansion Board



## Introduction

The 850 Expansion Board is designed to be used with the 850 Universal Interface (UI-5000) and PASCO Capstone software. The Expansion Board connects to a converter board via a ribbon cable. This converter board features a 44-pin connector which plugs into the 44-pin port on the back of the 850 Universal Interface. The Expansion Board allows access to eight digital input/output ports, three voltage inputs, three DC power supplies, and outputs from the three front signal generators. The board also features a circuit breadboard, allowing constructed circuits to be connected to these inputs and outputs. Two holes in the Expansion Board allow the board to be mounted to the top of the 850 Universal Interface using the included thumbscrews.

## Components

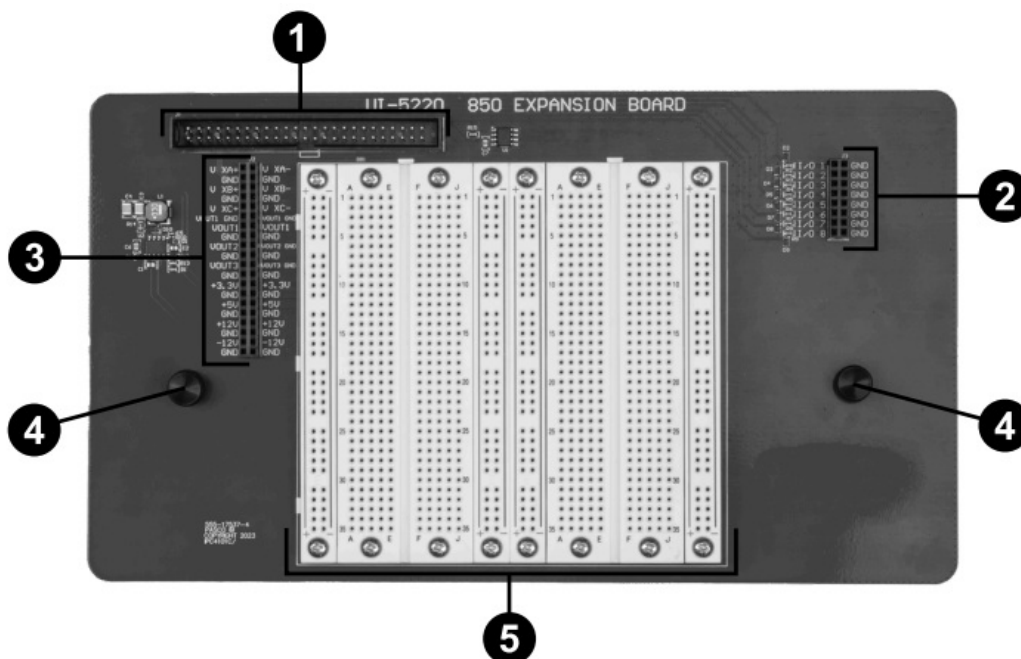
### Included components

- 850 Expansion Board
- Ribbon cable
- Converter board
- 2× thumbscrews
- 40× male-to-male jumper wires (15 cm each)

### Required components

- 850 Universal Interface (UI-5000)
- PASCO Capstone data collection software

## Features



1. Ribbon cable port
2. Digital I/O ports
3. Analog input and output ports
4. Thumbscrews
5. Circuit breadboard
6. Get the software

The board requires PASCO Capstone software. We offer a free trial of Capstone for Windows and Mac. To get the software, go to [pasco.com/downloads](https://www.pasco.com/downloads). If you have installed the software previously, check that you have the latest update by clicking Help and selecting Check for Updates.

### Setup

Follow these steps to connect the 850 Expansion Board to the 850 Universal Interface and PASCO Capstone.

1. Place the Expansion Board onto the top of the 850 Universal Interface, or another flat surface. If placed on top of the interface, secure the Expansion Board in place using the provided thumbscrews.

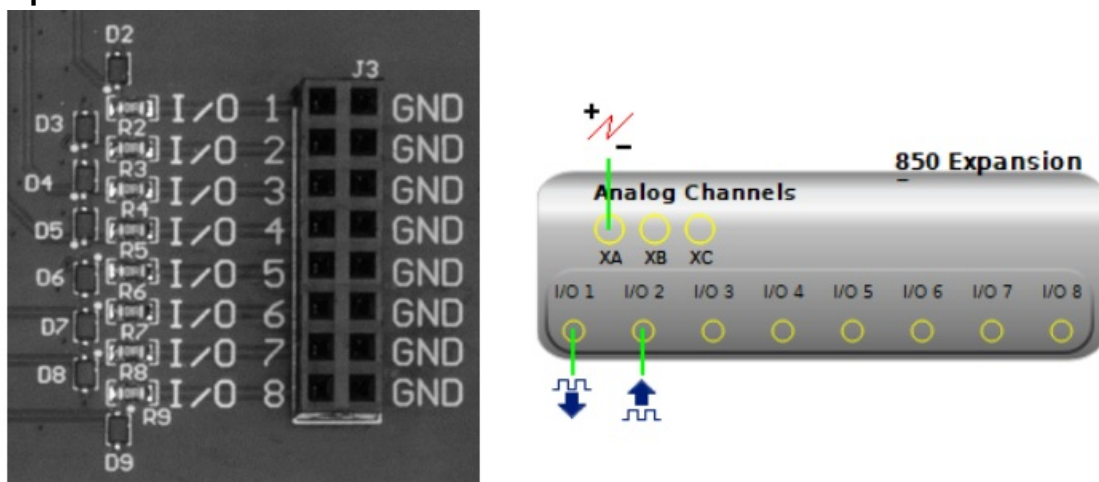


2. Plug one end of the ribbon cable into the 50-pin ribbon cable port on the Expansion Board, ensuring that the cable faces away from the circuit breadboard, as shown in Figure 1.

3. A tab on the plug casing and a notch in the port casing ensure that the plug can only be inserted in a single orientation.
4. Plug the other end of the ribbon cable into the 50-pin ribbon cable port on the converter board. A tab on the plug casing and a notch in the port casing ensure that the plug can only be inserted in a single orientation.
5. Fold the cable over as shown in Figure 1, without twisting the cable, then plug the 44-pin connector on the converter board into the 44-pin port on the back of the 850 Universal Interface.
6. Start PASCO Capstone, then select Hardware Setup in the Tools palette.
7. Connect the 850 Universal Interface to Capstone. (For more information on this, see the 850 Universal Interface's manual and the PASCO Capstone online help.)
8. The system will automatically detect and recognize the Expansion Board.
9. Once the Expansion Board is connected to the Capstone, a diagram of the expansion port with all configurable inputs and outputs labelled will appear in the Hardware Setup tool. Click inside the yellow circle over a port in the diagram to configure that port.

## Inputs and outputs

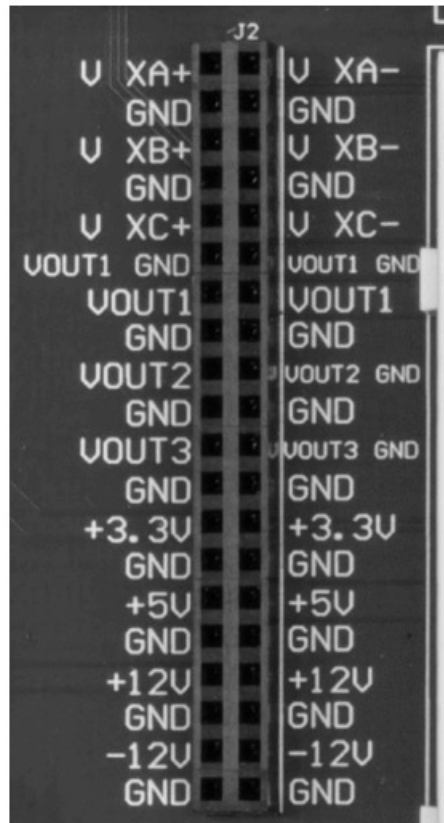
### Digital I/O ports



The 850 Expansion Board features eight digital input/output (I/O) ports, labelled 1 through 8, as shown above. Each I/O port is paired with a ground port on its immediate right. In the Capstone Hardware Setup tool, each port can be configured either to output a digital signal or to receive a digital signal. To do so, click inside the yellow circle over the desired port in the diagram and select either “Digital Input” or “Digital Output”. (See above.)

Signals received through channels configured as inputs can be selected as measurements in the Select Measurement> boxes found in many displays, including the graph display and digits display, as well as certain Blockly blocks. These measurements will be labelled as “State, Ch X#”, where # is the corresponding number of the I/O port from 1 to 8. However, if only a single I/O port is configured as a digital input, its measurement will be labelled only as “State”. You can turn each output on or off and choose between 3.3 V or 5.0 M in the Digital Output fi tool. For more detailed information on this, see the Capstone online help.

## Analog ports



in addition to the digital I/O ports, the 850 Expansion Board offers a variety of analog inputs and outputs. The ports for these can be found in a block to the left of the circuit breadboard. These ports include additional outputs for the 850 Universal Interface's signal generators (one each for Outputs 2 and 3, and two for Output 1, which is a higher power output than the other two), three additional analog input channels, and channels which supply DC voltage at any of four voltages (+3.3 V, +5 V, and  $\pm 12$  V)

The ports on the Expansion Board and their corresponding labels are:

- GND: Ground ports.
- V XA+: High voltage terminal for the XA analog input.
- V XA-: Low voltage terminal for the XA analog input.
- V XB+: High voltage terminal for the XB analog input.
- V XB-: Low voltage terminal for the XB analog input.
- V XC+: High voltage terminal for the XC analog input.
- V XC-: Low voltage terminal for the XC analog input.
- VOUT1 GND: Return (ground) ports for Output 1 of the signal generator.
- VOUT1: Output ports for Output 1 of the signal generator.
- VOUT2: Output port for Output 2 of the signal generator.
- VOUTZ GND: Return (ground) port for Output 2 of the signal generator.
- VOUT3: Output port for Output 3 of the signal generator.
- VOUT3 GND: Return (ground) port for Output 3 of the signal generator.
- +3.3V: Provides a constant voltage of +3.3 V DC.
- +5 V: Provides a constant voltage of +5 V DC.
- +12 V: Provides a constant voltage of +12 V DC.
- -12 V: Provides a constant voltage of -12 V DC.

The analog inputs can be used to measure an input voltage connected to the appropriate ports. To do so, locate the corresponding port in the Hardware Setup illustration of the expansion port, click inside the yellow circle over that port, and select Voltage Sensor from the list. These voltage measurements can then be selected in displays or certain Blockly blocks. The analog inputs of the Expansion Board are labelled as XA, XB, and XC. Note that these are distinct inputs from the analog inputs labelled A, B, and C on the front panel of the 850 Universal Interface. The Expansion Board analog inputs can be used simultaneously with all inputs on the front panel.

**NOTE:** Analog inputs XA, XB, and XC are not precisely in sync with the inputs on the front panel of the 850 Universal Interface. Therefore, for experiments involving very high-frequency sampling, do not use the front panel and Expansion Board measurements simultaneously. Additionally, some distortion in measurements may occur when using inputs XA, XB, and XC to measure the voltages of large currents.

### Using the breadboard

The circuit breadboard can be used to easily connect the available inputs and outputs from the 850 Universal Interface to constructed circuits. Use the male-to-male jumper wires provided with the Expansion Board to connect the input and output ports to holes on the breadboard, or to connect holes. In the two-column strips, each hole is electrically connected to all holes in the same column. In the ten-column strips, the five holes in each row of columns A through E are connected, and the five holes in each row of columns F through J are connected, but the two sets of columns are not connected.

### Software help

The PASCO Capstone Help provides information on how to use this product with the software. You can access the help from within the software or online.

Software: Help > PASCO Capstone Help

Online: [help.pasco.com/capstone](https://help.pasco.com/capstone)

### Specifications and accessories

Visit the product page at [pasco.com/product/UI-5220](https://pasco.com/product/UI-5220) to view the specifications and explore accessories. You can also download experiment files and support documents from the product page.

### Experiment files

Download one of several student-ready activities from the PASCO Experiment Library. Experiments include editable student handouts and teacher notes. Visit [pasco.com/freelabs/UI-5220](https://pasco.com/freelabs/UI-5220).

### Technical support

Need more help? Our knowledgeable and friendly Technical Support staff is ready to answer your questions or walk you through any issues.

Chat [pasco.com](https://pasco.com)

Phone 1-800-772-8700 x1004 (USA)

+1 916 462 8384 (outside USA)

Email [support@pasco.com](mailto:support@pasco.com)

### Limited warranty

For a description of the product warranty, see the Warranty and Returns page at [www.pasco.com/legal](https://www.pasco.com/legal).

### Copyright

This document is copyrighted with all rights reserved. Permission is granted to nonprofit educational institutions for reproduction of any part of this manual, providing the reproductions are used only in their laboratories and classrooms, and are not sold for profit. Reproduction under any other circumstances, without the written consent of PASCO Scientific, is prohibited.

### Trademarks

PASCO and PASCO Scientific are trademarks or registered trademarks of PASCO Scientific, in the United States and other countries. All other brands, products, or service names are or may be trademarks or service marks of, and are used to identify, products or services of, their respective owners. For more information visit [www.pasco.com/legal](http://www.pasco.com/legal).

### product end-of-life disposal


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 recycling or disposal service, or the place where you purchased the product. The European Union WEEE (Waste Electronic and Electrical Equipment) symbol on the product or its packaging indicates that this product must not be disposed of in a standard waste container.

### CE statement

This device has been tested and found to comply with the essential requirements and other relevant provisions of the applicable EU Directives.

---

## Documents / Resources

	<a href="#">PASCO UI-5220 Expansion Board</a> [pdf] Instruction Manual UI-5220, UI-5220 Expansion Board, Expansion Board, Board
---	--

## References

- [P PASCO Capstone Help](#)
- [P PASCO scientific | Science Lab Equipment and Teacher Resources](#)
- [P PASCO scientific | Science Lab Equipment and Teacher Resources](#)
- [P Lab Experiment Library - Resources | PASCO](#)
- [P 850 Expansion Board - UI-5220 - Products | PASCO](#)
- [P Privacy Policies | PASCO](#)
- [User Manual](#)

### Manuals+, Privacy Policy

This website is an independent publication and is neither affiliated with nor endorsed by any of the trademark owners. The "Bluetooth®" word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. The "Wi-Fi®" word mark and logos are registered trademarks owned by the Wi-Fi Alliance. Any use of these marks on this website does not imply any affiliation with or endorsement.