

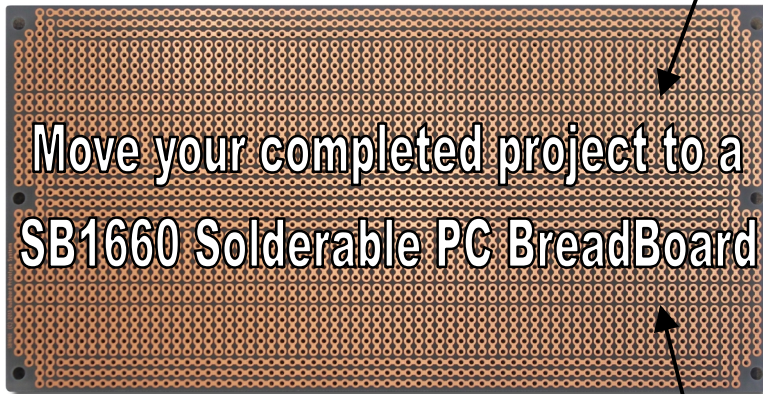
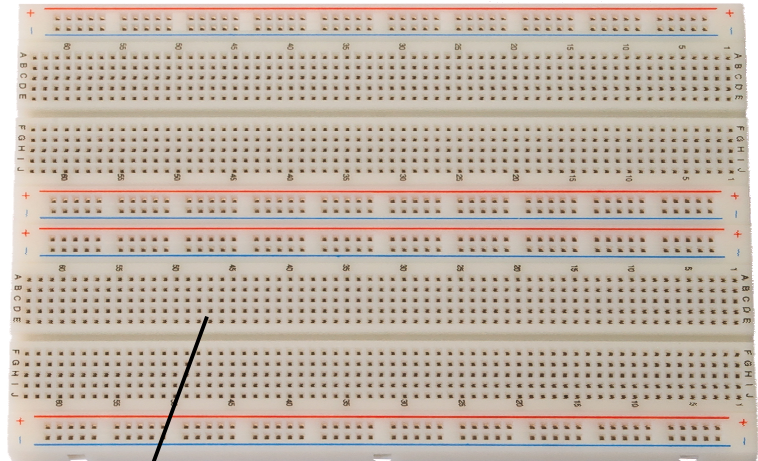
# BB1660™, BB1660T™ Large BreadBoards



1660 tie point solderless plug-in breadboards provide a quick way to build and test circuits for experimentation or when learning electronics.

## BB1660 - 1660 tie-point plug-in Solderless BreadBoard

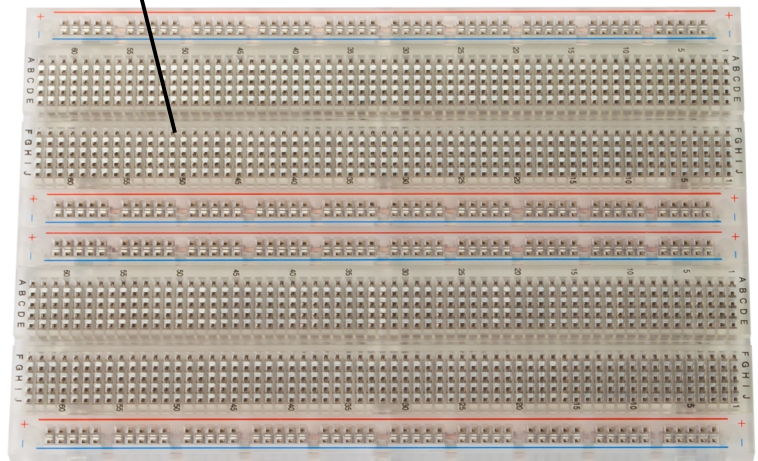
ABS plastic with color legend  
2 IC/Circuit Areas, 2 x 630 tie-points  
4 Distribution strips, 400 tie-points  
Size: 6.5 x 4.4 x 0.3in  
(165.1 x 109.2 x 8.5mm)



## BB1660T – Transparent 1660 tie-point plug-in Solderless BreadBoard

Transparent ABS plastic with color legend  
2 IC/Circuit Areas, 2 x 630 tie-points  
4 Distribution strips, 400 tie-points  
Size: 6.5 x 4.4 x 0.3in  
(165.1 x 109.2 x 8.5mm)

The transparent breadboard is great for beginners because they can see their circuit connections.



**BusBoard Prototype Systems - Built for designers**

[www.BusBoard.com](http://www.BusBoard.com) [sales@busboard.com](mailto:sales@busboard.com)

BPS-DAT-(BB1660)-0001 Rev 1.00 Datasheet.doc

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# Solderless Plug-in BreadBoards



## Solderless BreadBoard Specifications

**BB300 Body Material:** White ABS Plastic with Black Printed Legend  
**BB400/BB830/BB1660 Body Material:** White ABS Plastic with Color Printed Legend  
**BB400T/BB830T/BB1660T Body Material:** Transparent ABS Plastic with Color Printed Legend

**Hole Pitch/Style:** 0.1" (2.54 mm), Square Wire Holes

**ABS Heat Distortion Temperature:** 84° C. (183° F.)

**Spring Clip Contact:** Phosphor Bronze with Plated Nickel Finish  
**Contact Life:** 50,000 insertions  
**Rating:** 36 Volts, 2 Amps

**Insertion Wire Size:** 21 to 26 AWG wire, or 0.025" Square post headers  
0.016 to 0.028 inches diameter (0.4 to 0.7mm diameter)

**Backing:** Peelable adhesive tape for attaching to a surface.  
Metal back plates provided with 1660 tie point breadboards.

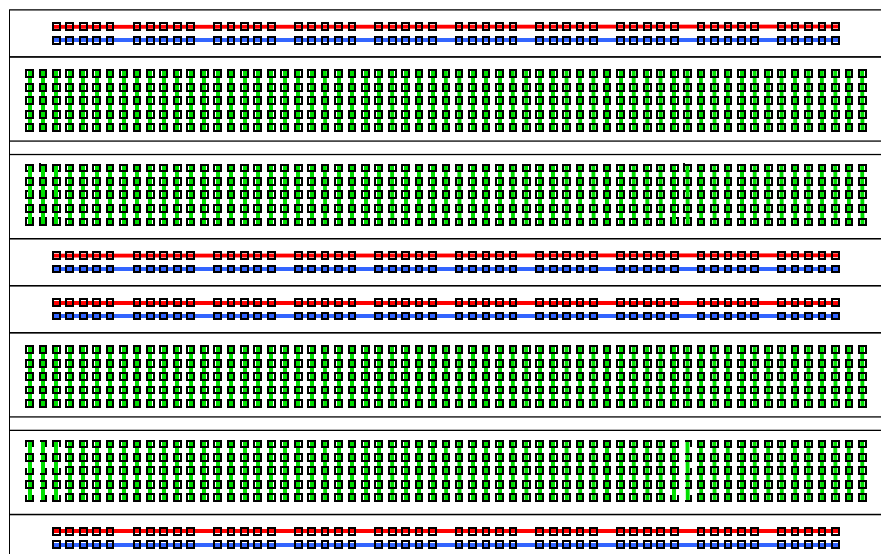
**Metal Back Plate Thickness:** 0.031 inches (0.8mm)

All BPS BreadBoards are Lead-Free and *RoHS Compliant*.



## Internal Connections

The BB1660 and BB1660T breadboards have four rows of 63 vertical columns. Each column has 5 connected holes each (the green lines). This is the circuit area. There are also 8 "rails" (or distribution strips) for power and ground running horizontally (the red and blue lines). A distribution strip can be used to carry a signal if it is not needed for power or ground.



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## **Solderless BreadBoard FAQ**

### **Q: What circuit frequencies can I use with a plug-in solderless breadboard?**

A: Due to large stray capacitance (from 2-25pF per contact point), the inductance of connections, and a relatively high and not very reproducible contact resistance, solderless breadboards are limited to operate at relatively low frequencies, usually less than 10 MHz, depending on the nature of the circuit. The relatively high contact resistance can also be a problem for some DC and very low frequency circuits.

Source <http://en.wikipedia.org/wiki/Breadboard>

Higher frequency operation may be possible in some cases, depending upon the circuit requirements.

Note: Solderable PC BreadBoards, such as the BPS BR1, SB300, SB400, SB404, SB830, and SB1660 will provide lower stray capacitance and lower connection resistance which may allow higher frequency operation for some circuits.

For circuits sensitive to small changes in values, component adjustments may be needed when the circuit is moved from a plug-in breadboard to a Solderable PC BreadBoard, due to these small differences.

### **Q: Can I plug DIL or SIL connector headers into the breadboard?**

A: Yes. The square pin of a standard 0.1" spacing header is typically 0.025 inches wide. This is within the 0.016 to 0.028 inch diameter wire insertion size range recommended for the breadboard.

## **Solderless BreadBoard NSFAQ**

### **Q: Who invented the solderless breadboard?**

A: US Patent #203938 was awarded to Ronald J. Portugal of EI Instruments Inc. in 1971.

### **Q: Why is phosphorus added to the bronze used in the contacts?**

A: Phosphor bronze is an alloy of copper with 3.5 to 10% of tin and a significant phosphorus content of up to 1%. The phosphorus is added as deoxidizing agent during melting.

These alloys are notable for their toughness, strength, low coefficient of friction, and fine grain. The phosphorus also improves the fluidity of the molten metal and thereby improves the castability, and improves mechanical properties by cleaning up the grain boundaries.

Source [http://en.wikipedia.org/wiki/Phosphor\\_bronze](http://en.wikipedia.org/wiki/Phosphor_bronze)

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