



# VGA & RS-232 Extender

EXT-VGARS232-141

User Manual



Release A4

# Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this product near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install or place this product near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. To reduce the risk of electric shock and/or damage to this product, never handle or touch this unit or power cord if your hands are wet or damp. Do not expose this product to rain or moisture.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Batteries that may be included with this product and/or accessories should never be exposed to open flame or excessive heat. Always dispose of used batteries according to the instructions.

# Warranty Information

Gefen warrants the equipment it manufactures to be free from defects in material and workmanship.

If equipment fails because of such defects and Gefen is notified within two (2) years from the date of shipment, Gefen will, at its option, repair or replace the equipment, provided that the equipment has not been subjected to mechanical, electrical, or other abuse or modifications. Equipment that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for ninety (90) days from the day of reshipment to the Buyer.

This warranty is in lieu of all other warranties expressed or implied, including without limitation, any implied warranty or merchantability or fitness for any particular purpose, all of which are expressly disclaimed.

1. Proof of sale may be required in order to claim warranty.
2. Customers outside the US are responsible for shipping charges to and from Gefen.
3. Copper cables are limited to a 30 day warranty and cables must be in their original condition.

The information in this manual has been carefully checked and is believed to be accurate. However, Gefen assumes no responsibility for any inaccuracies that may be contained in this manual. In no event will Gefen be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. The technical information contained herein regarding the features and specifications is subject to change without notice.

For the latest warranty coverage information, refer to the Warranty and Return Policy under the Support section of the Gefen Web site at [www.gefen.com](http://www.gefen.com).

## Technical Support

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## Product Registration

Register your product here: <http://www.gefen.com/kvm/Registry/Registration.jsp>

# Operating Notes

- Shielded CAT-5e (or better) cables are recommended and should not exceed 330 feet (100 meters).

**VGA & RS-232 Extender** is a trademark of Gefen, LLC.

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Gefen, LLC reserves the right to make changes in the hardware, packaging, and any accompanying documentation without prior written notice.



This product uses UL or CE listed power supplies.

## Features

- Extends VGA and RS-232 up to 330 feet (100 meters) over one CAT-5 cable
- Supports resolutions up to 1920 x 1200
- Trim pot and Dip switches for fine video adjustment
- Supports RS-232 pins 2 (Rx), 3 (Tx), and 5 (Ground) up to 19,200 bits per second
- Useful for Digital Signage Applications

## Packing List

The VGA & RS-232 Extender ships with the items listed below. If any of these items are not present in the box when you first open it, immediately contact your dealer or Gefen.

- 1 x VGA RS232 Extender - Sender Unit
- 1 x VGA RS232 Extender - Receiver Unit
- 1 x 6 ft. VGA cable (M-F)
- 1 x 6 ft. DB-9 cable
- 2 x Mounting Brackets
- 2 x 5V DC Power Supplies
- 1 x Quick-Start Guide



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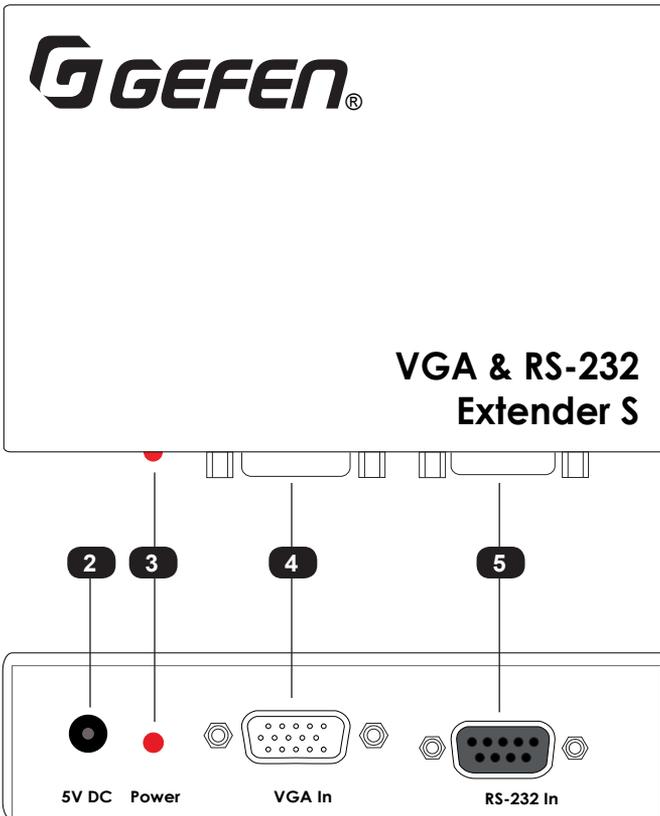
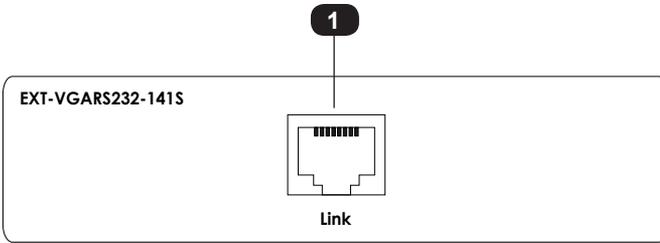


# VGA & RS-232 Extender

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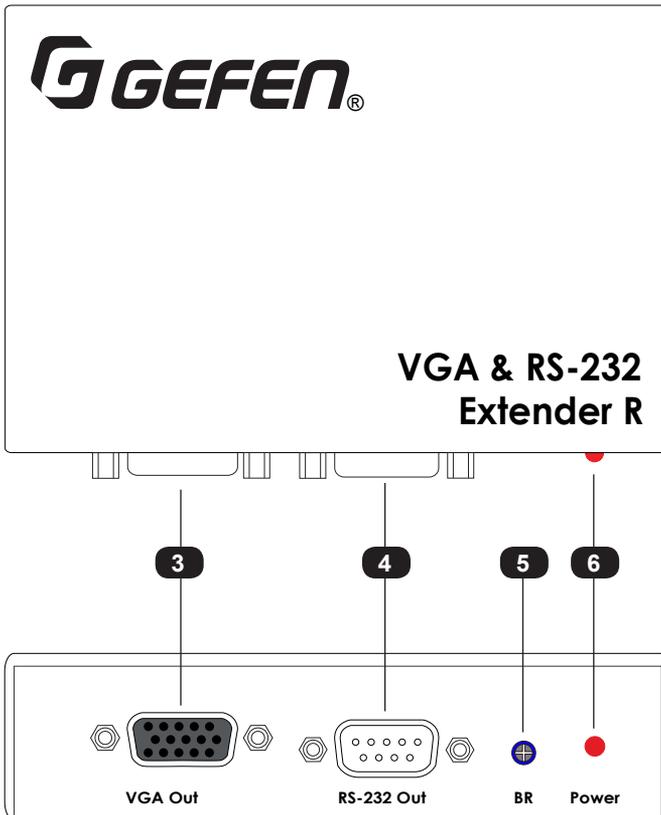
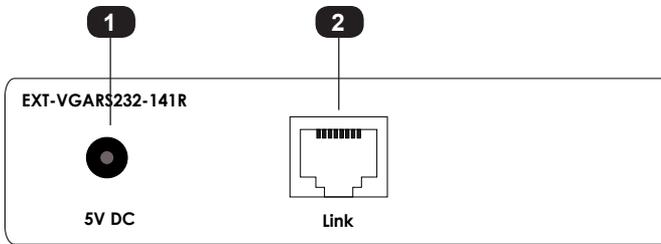
Getting Started

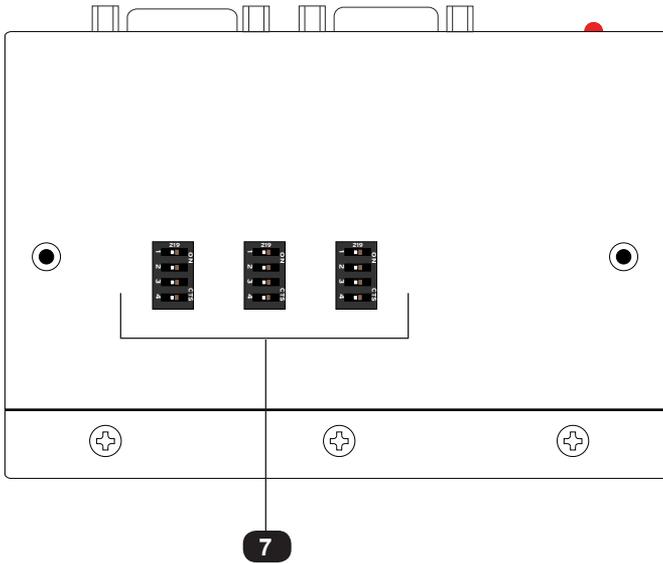
Sender unit



ID	Name	Description
1	Link	Connects the Sender unit to the Receiver unit using shielded CAT-5e (or better) cable.
2	5V DC	Connect the included 5V DC power supply to this power receptacle.
3	Power	This LED indicator will glow solid red when the Sender unit is powered.
4	VGA In	Connect the included VGA cable from the source (e.g. computer) to this VGA port.
5	RS-232 In	Connect the included RS-232 cable from this port to an automation system.

## Receiver unit





ID	Name	Description
1	5V DC	Connect the included 5V DC power supply to this power receptacle.
2	Link	Connects the Receiver unit to the Sender unit using shielded CAT-5e (or better) cable.
3	VGA Out	Connect a VGA cable from the display to this VGA port.
4	RS-232 Out	Connect an RS-232 cable from this port to an RS-232 device.
5	BR (Brightness control)	Use a small Phillips-type screwdriver to adjust the brightness of the picture.
6	Power	This LED indicator will glow solid red when the Receiver unit is powered.
7	DIP Switches (bottom of unit)	These DIP switches are used to compensate for color divergence. See <a href="#">Compensating for Cable Skew (page 11)</a> for more information.

## Connection Instructions

### ▶ Video

1. Connect the included VGA cable from the video source (e.g. computer) to the **VGA In** port on the Sender unit.
2. Connect a VGA cable from the display to the **VGA Out** port on the Receiver unit.

### ▶ CAT-5

3. Connect a shielded CAT-5e (or better) cable from the **Link** port on the Sender unit to the **Link** port on the Receiver unit. The cable should not exceed 330 feet (100 meters) in length.

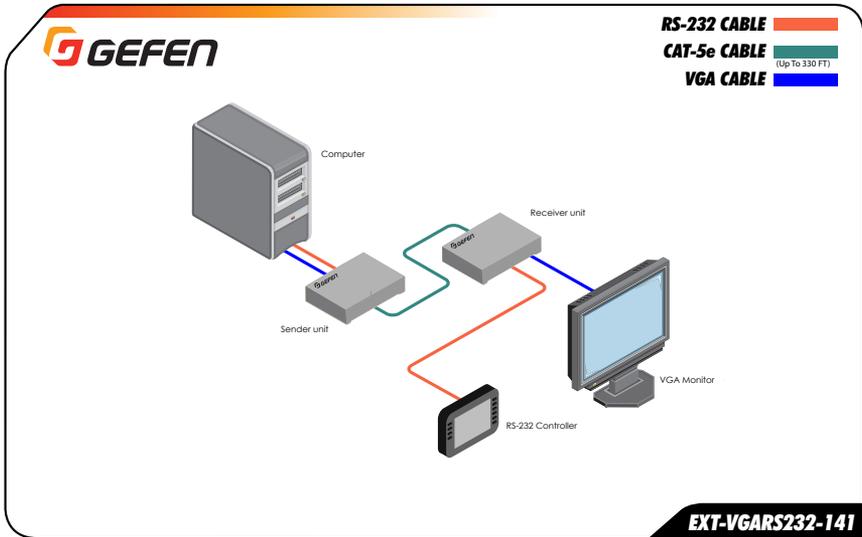
### ▶ RS-232 (optional)

4. Connect the included RS-232 cable from the automation controller to the **RS-232 In** port on the Sender unit.
5. Connect an RS-232 cable from the **RS-232 Out** port on the Receiver unit to the RS-232 device.

### ▶ Power

6. Connect the included power supply to the 5V DC power receptacle and connect the power cord to an available electrical outlet.

## Sample Wiring Diagram





# VGA & RS-232 Extender

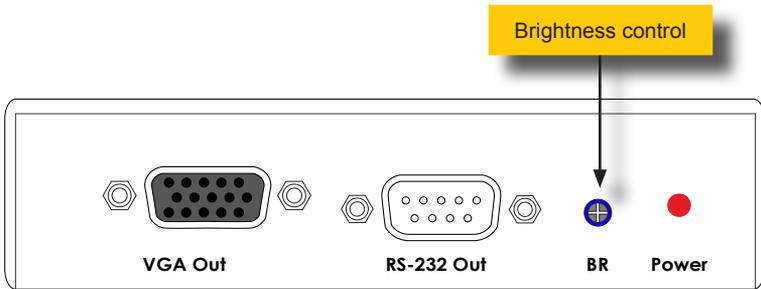
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Basic Operation

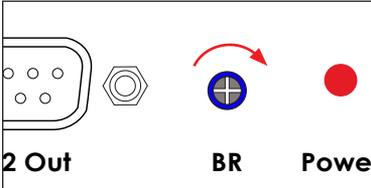
## Brightness Control

The VGA & RS-232 Extender includes a trim pot on the Receiver unit which allows you to adjust the picture brightness.

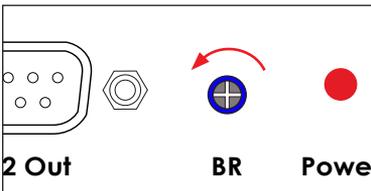
1. Use a small flathead or Phillips-type screwdriver to adjust the trim pot.



2. Turn the trim pot clockwise until it stops turning. Do not force the trim pot past this point.



3. Turn the trim pot counter-clockwise, while monitoring the picture, until the brightness reaches the desired level.

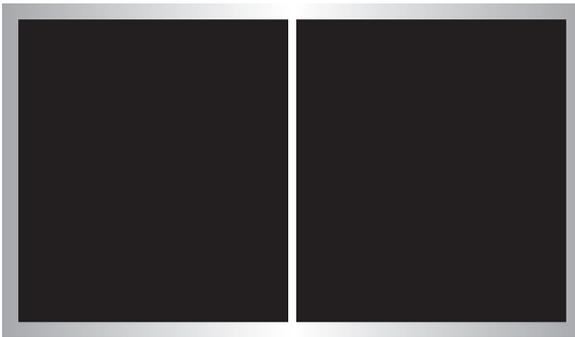


## Compensating for Cable Skew

In order to reduce the amount of crosstalk between twisted pairs within a shielded CAT-5e (or better) cable, the rate of twist will vary for each twisted pair and will vary between manufacturers. The rate of twist affects the length of each twisted pair and is referred to as *cable skew*.

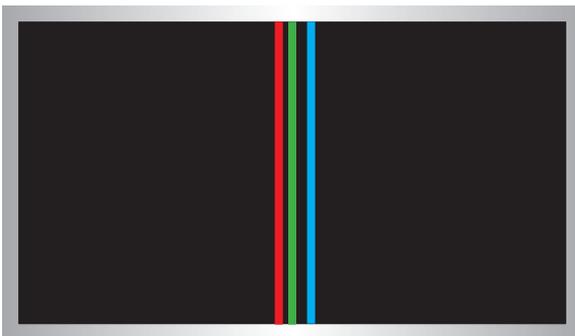
For example, a video signal with a single white line will appear “white” because each RGB color component signal arrives at the same time and combines with one another to create a solid white line, as shown below.

**Figure 1.1** - Normal video signal



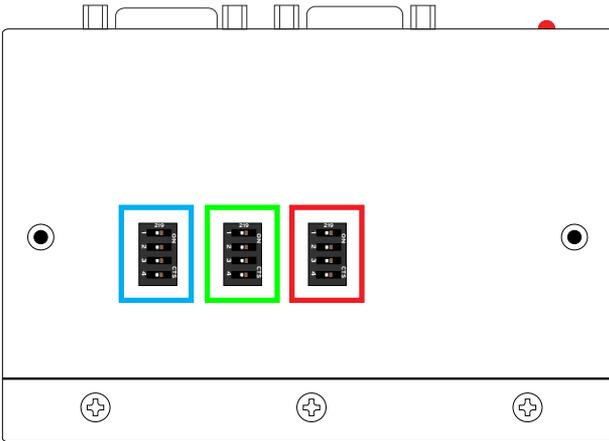
However, when extending a video signal over CAT-5 (or better), *cable skew* can cause each color component to arrive at the destination at different times. This causes an undesirable effect known as *color divergence* (separation), where one or more color components are shifted to the left or right.

**Figure 1.2** - Video signal with color divergence (exaggerated for illustrative purposes)



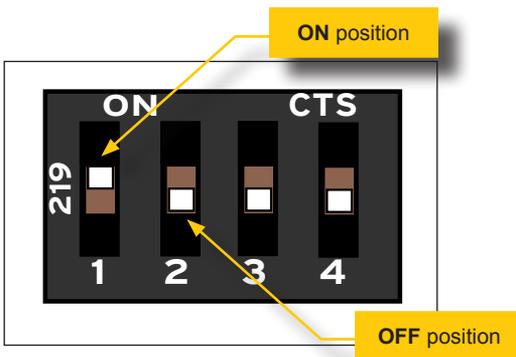
To address this issue, the VGA & RS-232 Extender provides three banks of DIP switches, located on the bottom of the Receiver unit. Each DIP switch bank controls a specific color component. Peel off the metallic-gray adhesive strips to expose the DIP switch banks.

The colored rectangles, in the illustration below, identifies the color component (Blue, Green, and Red) that is controlled by each DIP switch bank.



By default, the four DIP switches in all three banks are set to the OFF (down) position.

The illustration below shows DIP switch 1 in the ON position and DIP switch 2, 3, and 4 in the OFF position.



Use a sharp-pointed object, such as the end of a paperclip, mechanical pencil, or small screwdriver to slide the DIP switch to the desired position.

See the next page for information on the recommended DIP switch settings based on the shielded CAT-5e (or better) cable length.

**Table 1.1 - Recommended DIP switch settings based on cable length**

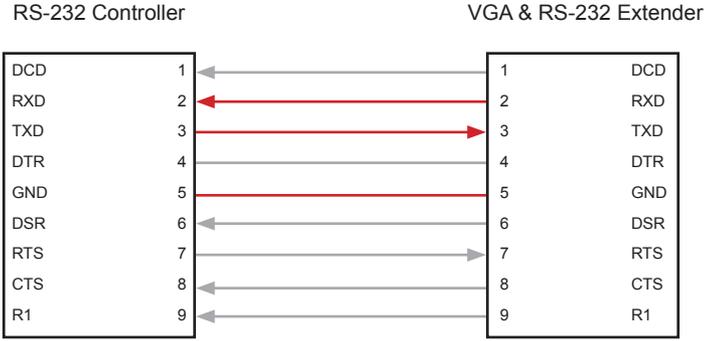
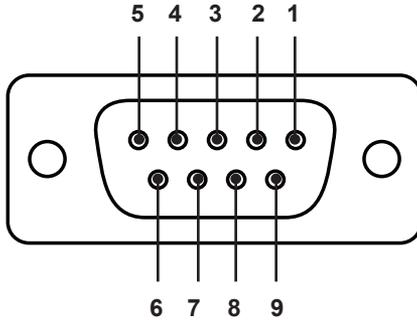
A colored square indicates that the DIP switch is set to the ON position. If no color is present, then the DIP switch is set to the OFF position.

Cable length	Blue				Green				Red			
	1	2	3	4	1	2	3	4	1	2	3	4
0 - 25 ft (0 - 7.6 m)												
26 - 100 ft (7.9 - 30 m)	Blue				Green				Red			
101 - 200 ft (31 - 60 m)		Blue				Green				Red		
201 - 300 ft (61 - 91 m)			Blue				Green				Red	
> 300 ft (> 91 m)				Blue				Green				Red

**Information**

The table, above, should be used as a guideline. If one of the color components is not "aligned" with the remaining color components, then adjust the DIP switch bank that controls the affected color component.

The VGA & RS-232 Extender provides RS-232 pass-through capability when connecting an automation device to the Sender unit and an RS-232 device to the Receiver unit. RS-232 can be extended up to 330 feet (100 meters) and supports baud rates up to 115200.



Only TXD, RXD, and GND pins are used.

## RS-232 Settings

Description	Setting
Baud rate	115200
Data bits	8
Parity	None
Stop bits	1
Hardware flow control	None



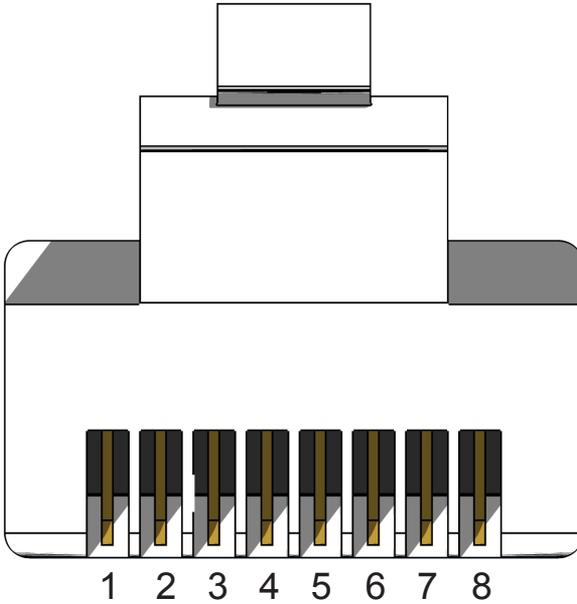


# VGA & RS-232 Extender

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Appendix

Front of RJ-45 Connector



Gefen recommends the TIA/EIA-568-B wiring option. Use the following table when terminating cables in the field.

Pin	Color	Description
1	Orange / White	TD+ (Transmit Data, positive differential signal)
2	Orange	TD- (Transmit Data, negative differential signal)
3	Green / White	RD+ (Receive Data, positive differential signal)
4	Blue	Unused
5	Blue / White	Unused
6	Green	RD- (Receive Data, negative differential signal)
7	Brown / White	Unused
8	Brown / White	Unused



### Information

Shielded CAT-5e (or better) cabling is recommended.

Connectors, Controls, and Indicators	
VGA In	• 1 x VGA HD-15, male
VGA Out	• 1 x VGA HD-15, female
RS-232 In	• 1 x DB-9, female
RS-232 Out	• 1 x DB-9, male
Link (Sender / Receiver)	• 1 x RJ-45, shielded
5V DC (Sender / Receiver)	• 1 x non-locking
BR (Brightness)	• 1 x trim-pot
Power	• 1 x LED, red

Operational	
Video Amplifier Bandwidth	• 350 MHz
Horizontal Frequency Range	• 15 - 70 kHz
Vertical Frequency Range	• 30 - 170 kHz
Power Consumption	• 5W (max.) each

Physical	
Dimensions (W x H x D)	• 4" x 2.8" x 1.1" (101mm x 71mm x 27mm)
Unit Weight	• 0.5 lbs (0.23 kg)



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