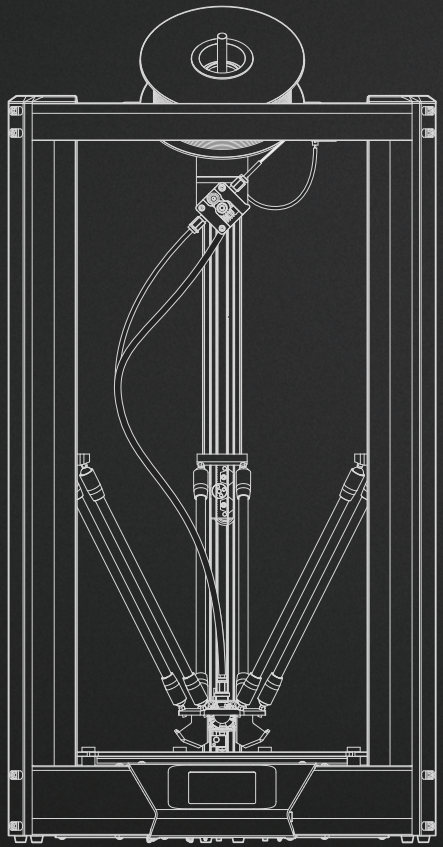


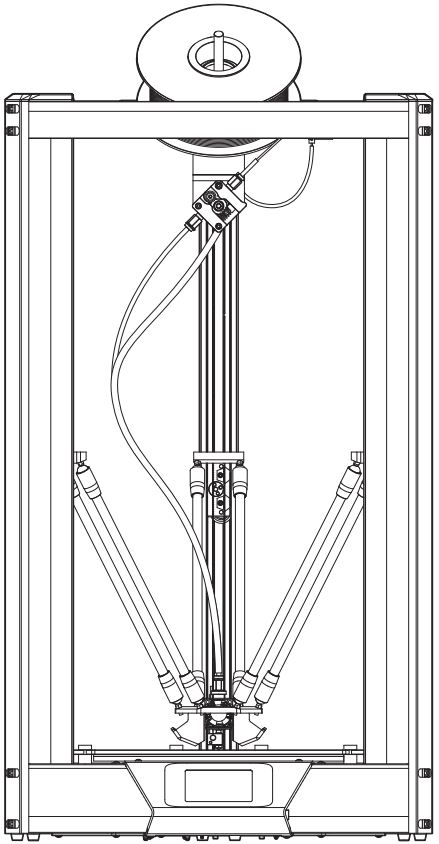
IIIP

Monoprice Delta Pro 3D Printer

User's Manual

MONOPRICE

Thank you, and congratulations on your purchase of the Monoprice Delta Pro 3D printer! The Delta Pro is a world-class desktop machine designed for speed, precision, and reliability. We know you'll love printing your designs on the Delta Pro, but before you do, please read the manual thoroughly.



MONOPRICE DELTA PRO MANUAL
CONTENTS

Safety Warnings and Guidelines

1. Be careful not to damage the glass build plate.
2. Take care to avoid touching hot parts, including heat blocks, nozzle, extruded filament, and the heated build plate.
3. Keep the printer and all accessories out of reach of small children.
4. Do not remove or disconnect the USB cable when printing from a computer.
5. Do not pull or twist the black cable harness at any time.
6. Do not force or tear anything during unpacking and setup. This may cause damage to the printer and/or its accessories.
7. Do not reach inside the printer during operation. Always allow the printer and extruded filament to cool before reaching inside.
8. Ensure that the printer is turned off and unplugged from its power source before making repairs or performing service.
9. Do not install this device on an unstable surface where it could fall and cause either personal injury or damage to the device and/or other equipment.
10. Do not subject the product to extreme force, shock, or fluctuations in temperature or humidity.
11. This device is intended for indoor use only.
12. Do not expose this device to water or moisture of any kind. Do not place drinks or other containers with moisture on or near the device. If moisture does get in or on the device, immediately unplug it from the power outlet and allow it to fully dry before reapplying power.
13. Do not touch the device, the power cord, or any other connected cables with wet hands.
14. Use only in a well-ventilated area. Do not use in confined spaces.
15. Prior to operation, check the unit and power cord for physical damage. Do not use if physical damage has occurred.
16. Before plugging the unit into a power outlet, ensure that the outlet provides the same type and level of power required by the device.
17. Unplug this device from the power source when not in use.
18. Take care to prevent damage to the power cord. Do not allow it to become crimped, pinched, walked on, or become tangled with other cords. Ensure that the power cord does not present a tripping hazard.
19. Never unplug the unit by pulling on the power cord. Always grasp the connector head to unlock it from the port.

Customer Service

The Monoprice Customer Service department is dedicated to ensuring that your ordering, purchasing, and delivery experience is second to none. If you have any problem with your order, please give us an opportunity to make it right. You can contact a Monoprice Customer Service representative through the Live Chat link on our website www.monoprice.com during normal business hours (Mon-Fri: 5am-7pm PT, Sat-Sun: 9am-6pm PT) or via email at support@monoprice.com

Package Contents

Please take an inventory of the package contents to ensure you have all the items listed below. If anything is missing or damaged, please contact Monoprice Customer Service for a replacement.

- 1× Monoprice Delta Pro 3D Printer
- 1× MP Select PLA Plus Filament Roll (Black, 1 kg)
- 1× Spare PTFE-lined Nozzle
- 1× Spare All-metal Nozzle
- 1× Auto-level Sensor
- 1× Tool Kit (hex wrenches: 1.5 and 2 mm)
- 1× Touchscreen Stylus
- 4× Bowden Clips

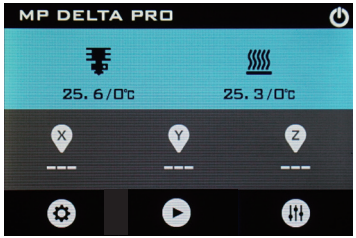
Software Installation and Setup

We recommend using KISSlicer for use with the Delta Pro. Please visit the Delta Pro page of monoprice.com to download KISSlicer and for instructions on installation. The installation package comes with everything you need to get started.

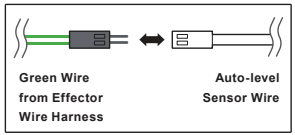
Auto-Leveling

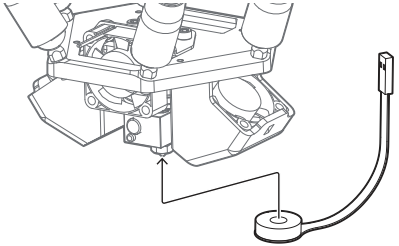
Before your first print, and anytime you remove the build plate, you'll want to run an auto-level to ensure that your parts adhere well to the glass. Follow the procedure below to run an auto-level and calibrate the Z-offset of your machine.

1. Ensure that the hotend is at room temperature.

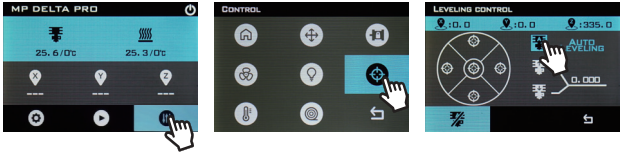


2. Connect the auto-level sensor to the green wire from the cable harness, and affix the the sensor's foam ring to the nozzle. **NOTE: Use the minimum amount of force required to affix the sensor to the nozzle. If the nozzle is touching the plastic membrane, it may prematurely trigger the switch.**





3. On the LCD screen, tap > > Auto Leveling



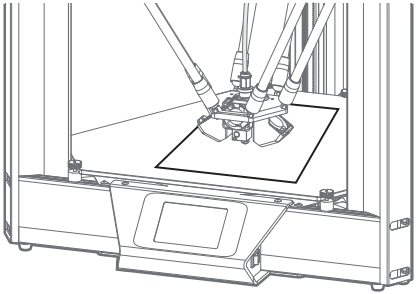
4. Once the process is complete, remove the auto-level sensor.

Adjusting the Z-Offset

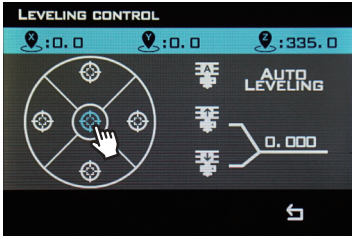
The Z-offset is the distance between the glass build plate and the nozzle. The auto-level process ensures that this distance is consistent across the entire surface of the build plate, but the distance itself must be manually calibrated. You can do this easily using a piece of clean, flat copy paper, which are usually about 100 microns thick.

1. Tap >

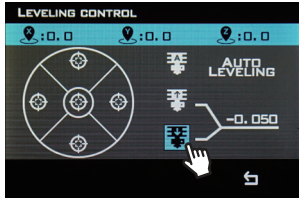
2. Place the piece of copy paper on the build plate.



3. Tap the in the center of the circle.



4. Tap or to adjust the height of the nozzle up or down.



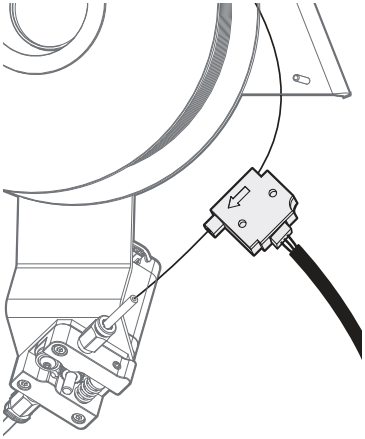
5. Adjust the height of the nozzle until it pinches the paper, checking each time whether the paper can be moved. Once the paper cannot be moved, return to the main menu and tap to home the printer.

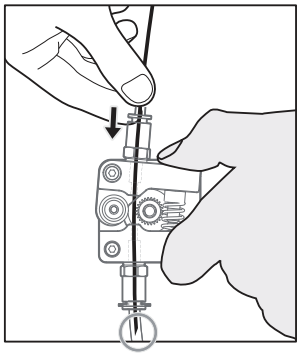
Cleaning the Build Plate

To prepare the build plate for printing, use rubbing alcohol or another ammonia-free solvent and a soft, lint-free cloth to remove any dust and oil from the surface of the glass while it is at room temperature.

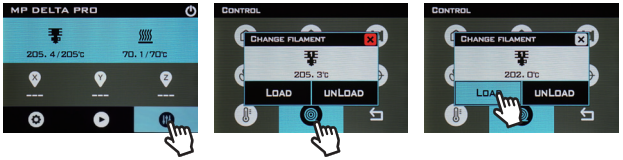
Loading Filament

1. Place the filament spool on the holder so that the working end of the filament hangs down to the right.
2. Cut the end of the filament at an angle as illustrated.
3. Gently straighten a segment about 5 cm (2”) from the end with your fingertips to make it easier to feed the filament through the sensor and the extruder.
4. Remove the filament sensor from its holder and feed the end of the filament through the sensor in the direction as indicated by the arrow, then into the tube on the right side of the extruder.
5. Pinch the extruder idler lever and push the filament past the gear and into the bowden tube just past the pneumatic connector.



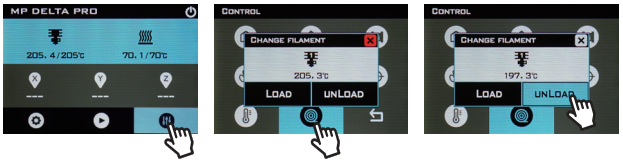


6. On the LCD screen, preheat the nozzle to the material's working temperature e.g. for PLA, ≈200°C.
7. Once the nozzle is up to temperature, tap > > **Load**



Unloading Filament

1. On the LCD screen, preheat the nozzle to the material's working temperature e.g. for PLA, ≈200°C.
2. Once the nozzle is up to temperature, tap > > **Unload**



3. Hold the filament sensor and carefully rotate the spool while the filament is unloading to avoid tangles.
4. **IMPORTANT: When removing the end of the filament from the sensor, carefully string the end through the hole in the spool to avoid overlapping and tangles. These WILL cause filament jams and failed prints.**

Swapping Hotends

The Delta Pro's hotend is easily swappable so you can print with different materials at different temperatures. While we always recommend using the default, PTFE-lined hotend for use with PLA and many other low-temperature materials, the included all-metal hotend allows you to print with materials which require temperatures hotter than what PTFE can handle. As always, please remember to use your printer in a well ventilated area.

Removing and Replacing a Hotend

1. Preheat the hotend and unload the filament.
2. Cool down the hotend, then turn off the machine.
3. Remove the Bowden tube from the effector by removing the plastic pneumatic connector clips and depressing the top of the connector while pulling the tube.
4. Disconnect the heater and thermistor connectors from the cable harness.
5. While holding the hotend, use a 1.5 mm hex wrench (included) to loosen the two headless hex screws on the side of the heat sink below the effector, and the hotend should be easily removable.
6. Replace the hotend in the same orientation and tighten the screws.
7. Reconnect the heater, thermistor, and Bowden tube, ensuring that the tube is pushed all the way in.

General Slicer Settings

If using any other slicer besides KISSlicer, you can follow these guidelines and the guidelines on the Delta Pro webpage to configure your preferred slicing software for use with your machine. For the latest profiles and tips, please check the product's webpage and Facebook page regularly.

Machine Settings:

- Build Plate / Bed Diameter: 270 mm
- Build Envelope Height: 340 mm
- Firmware: 5D Absolute E
- File Extension: .gcode
- Fan On: M106 / Off: M107 (Fan can do PWM or blip to speed)
- Maximum Recommended Speed Settings:
  - Bottom, Top, and Perimeter: 30 mm/s
  - Loops and Infill: 60 mm/s
  - Travel: 100 mm/s
  - Z-speed: 50 mm/s
  - Max Acceleration: 1000 mm/s
- For G-code pre-, and postfixes, visit the Delta Pro webpage

General Settings

(Note: These are general settings guidelines and fine adjustments WILL need to be made for different materials):

- Extrusion Width: 0.4 mm
- Min. Flow Rate: 1 mm3/s
- Max. Flow Rate: 4 mm3/s
- Destring/Retraction Distance: 3-6 mm
- Destring/Retraction Speed: 100 mm/s

Selecting a File

To select a file, tap ▶, then use the arrows to highlight your file, ten tap ✓ **OK** and then tap **Yes** to begin printing.

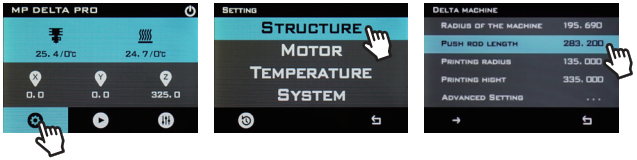
Calibrating the Printer

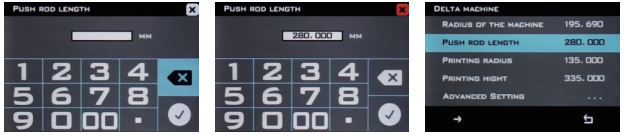
Your Monoprice Delta Pro was calibrated before leaving the factory to ensure great prints out of the box. However, sometimes it may be necessary re-calibrate certain functions of the printer over the natural course of use.

Calibrating Dimensional Accuracy

If you find that the dimensions of your prints differ from the dimensions of your CAD model beyond 10 microns or so, you may want to adjust the firmware to correct the discrepancy. Follow the steps below to analyze the error and calibrate your machine settings.

1. Go to the Delta Pro page at Monoprice.com and download the calibration box G-code.
2. Print the calibration box G-code.
3. Carefully measure the part with calipers, aligning the jaws with the layer lines and record the dimensions.
4. On the LCD screen, tap ⚙ > **Structure**. Note the “Push Rod Length.” Compute the new “Push Rod Length” value using the following formula: New Value = Old Value × (Measured Printed Dimension / 3D Model Dimension)
5. Tap **Push Rod Length**, erase the old value, and enter the new value.





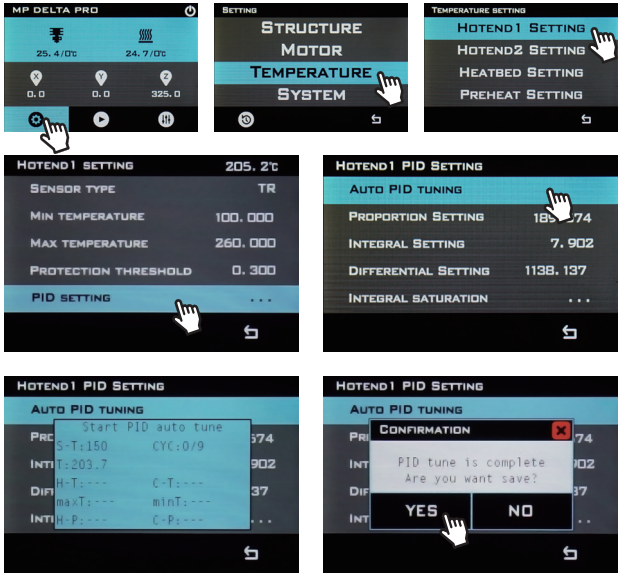
PID Tuning

If you find that your nozzle fails to maintain a stable temperature or fails to reach the target temperature, you may run an auto-PID tuning procedure to attempt to correct the issue. If nozzle temperature issues persist after running an auto-PID tune, you may need to replace your thermistor or heater. Follow the steps below to run an auto-PID tune.

Note: The tuning process will vary slightly depending on the nozzle hotend type and target temperature of the material you are trying to print. For the PTFE-lined nozzle, turn the part cooling fans (side fans) on 100% power before proceeding to tune the PID. Leave the fans off for the all-metal nozzle and materials with target temperatures higher than 260°C. You can turn on the fans by tapping 🛠 > ❄. 100% is the default input. Then tap ✓.

Turn to the next page.

1. On the LCD screen, tap ⚙ > **Temperature** > **Hotend1 Settings** > **PID Settings** > **Auto PID Tuning**
2. Wait for the process to complete.
3. Try preheating to your desired target temperature.



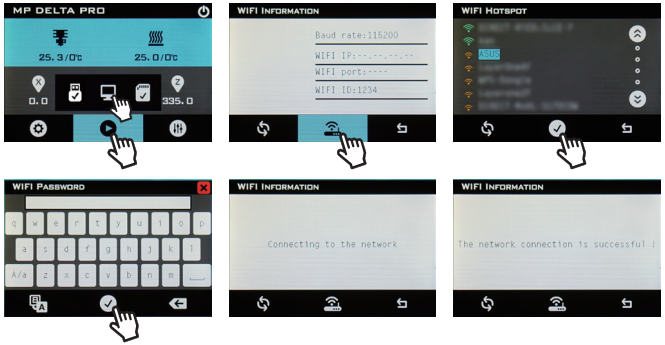
Connecting to Wi-Fi

The Delta Pro is equipped with Wi-Fi capabilities that allow you to start and stop a print, and use other functions remotely from its mobile app. For details and a link to download the mobile app, please visit the Delta Pro webpage.

To connect the Delta Pro to Wi-Fi, place the machine in a room with or nearby a Wi-Fi router. On the LCD screen, tap ▶ > 🖵 > 📶, then use the arrow keys to select the nearest router and tap ✓.

Enter the password of the router and tap the ✓. The LCD screen will notify you whether the attempt to connect to the router was successful.

Note: For the mobile app to work, it must be connected to the same Wi-Fi network as the machine.

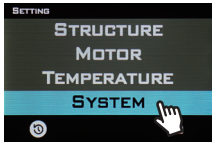


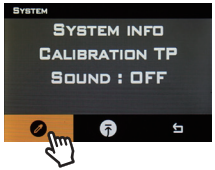
Customizing the UI

The Delta Pro's touchscreen LCD UI can be customized to your preferences in the following categories.

Changing the Color

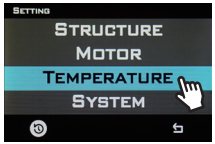
Change the color scheme of the LCD screen by tapping ⚙ > **System** > ✎ .

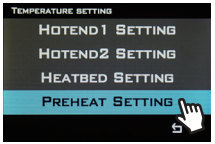


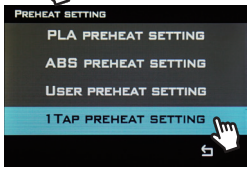


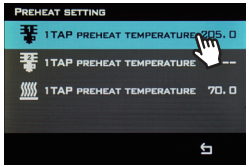
1Tap Preheat

You can change the 1Tap preheat target temperature by tapping ⚙ > **Temperature** > **Preheat Setting** > **1Tap Preheat** and then entering a target temperature value.



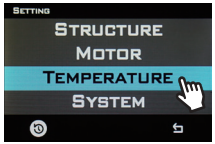


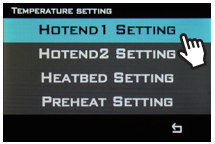


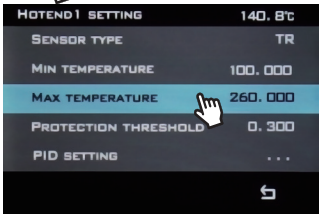


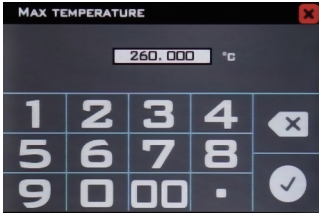
Maximum Temperatures

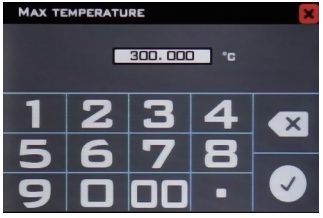
By default, the maximum temperatures allowed by the firmware are set to the maximum safe operating temperature of the PTFE-lined hotend, 260°C. If you would like to increase this while using the all-metal hotend, tap ⚙ > **Temperature** > **Hotend 1 Setting** > **Max Temperature** and enter a value at least 5°C beyond your desired target temperature to allow the PID to function properly.

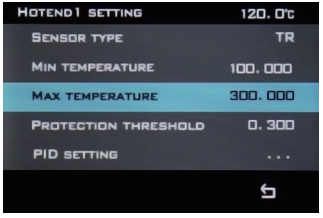








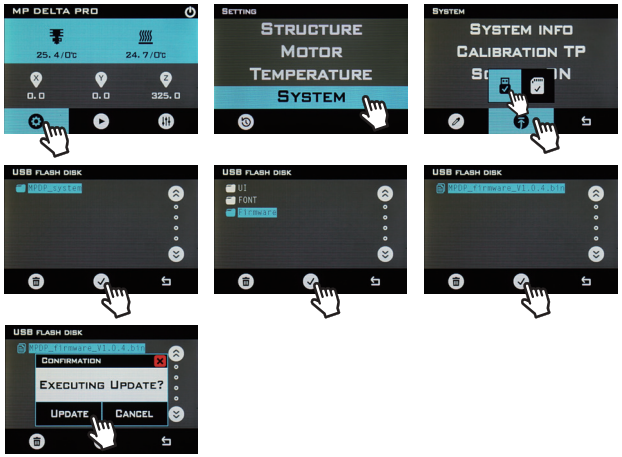




Updating the Firmware

We recommend updating your machine to the latest firmware before printing for the first time to ensure you have the latest version. Monoprice will release updates to the Delta Pro's firmware from time to time on the Delta Pro's webpage. Once you've downloaded the latest firmware, unzip the files to a USB drive and follow the steps below to perform the update.

1. On the LCD screen, tap  > **System** > 
2. Select the folder containing the .bin firmware file, then tap **Update**.
3. Repeat steps 1 and 2 to update the .ui user interface file.



Care and Maintenance

Regular care and maintenance will keep your Delta Pro looking and working like new for years. Please follow these care and maintenance guidelines for each component of your machine.

- Clean the machine's frame with a damp, lint-free cloth.
- Clean the glass build plate with rubbing alcohol or another ammonia-free solvent and a soft, lint-free cloth such as microfiber.
- Lubricate the magnetic control arms with PTFE or lithium grease on at least a monthly basis. This can be done by applying a small amount of grease onto the magnets of the control arms which function as a lubricant reservoir. After a few prints, wipe away any excess grease from the ball joints with a lint-free cloth.
- The carriages have been factory calibrated to ensure many thousands of hours of consistent, precision movement. If after an extended period of time they seem loose or noisy, they may require adjustment or lubrication.
  - To adjust the wheel spacing,
  - USE ONLY silicone lubricant on the wheels when they seem noisy
- Use a dry brush to clean the extruder gear's teeth when they become clogged or when the gear starts to slip.
- Clean the LCD touchscreen display while the machine is powered off using a soft cloth. DO NOT use any solvents or cleaning fluids on the display.

Notice for FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Radio Notice for FCC

CAUTION: This FCC Part 15 radio device operates on a non-interference basis with other devices operating at this frequency. Any changes or modification to said product not expressly approved by Monoprice, including the use of non-approved antennas, could void the user’s authority to operate this device.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

MONOPRICE

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