AXON PU 100

English Manual

Version 1.0 | April 2008

CE Declaration

We:

TerraTec Electronic GmbH, Herrenpfad 38, D-41334 Nettetal, Germany

hereby declare that the product:

AXON PU 100

to which this declaration refers is in compliance with the following standards or standardizing documents:

- EN 55013(2001)+A1(2003)

- EN 55020(2002)

The following are the stipulated operating and environmental conditions for said compliance:

residential, business and commercial environments and small-company environments.

This declaration is based on:

Test report(s) of the EMC testing laboratory

Content

Safety notes

Place of installation

Protect the PU 100 against the following influences to prevent distortion or discoloring of the housing or other serious damage:

- direct sunlight (e.g. near windows)
- high temperatures (near radiators, in direct sunlight or in closed vehicles during the daytime
- excessive humidity
- excessive dust
- sharp mechanical shocks.

Connections

- Use only the 13-pin AXON AXK 100 cable (available separately) to connect the PU 100 to the AXON.
- If you are using an electric guitar, connect its pickups to the PU 100 as well even if you do not need the conventional guitar sound. This connection is important for grounding the instrument to prevent noPhilippise and electric shock.
- Always grasp the plug, not the cable itself, when unplugging cables.
- Remove all cables before moving or transporting the instrument or any connected equipment.

Handling and transport

- Do not use excessive force on the controls or when inserting or removing plugs.
- Dropping or bumping the instrument or placing heavy objects on it can result in scratches or other damage.
- Take care not to damage the PU 100 when placing the instrument on a stand.

Cleaning

- Use a soft, dry cloth to clean the instrument.
- Moisten the cloth slightly to remove stubborn dirt.
- Never use cleaning products such as alcohol or thinner.

Customer service, maintenance and modifications

- The PU 100 does not contain any user-serviceable parts. Opening the housing or other tampering may result in electrical shock or irreparable damage. Please refer all servicing work to TerraTec technicians.

TerraTec cannot be held liable for damage resulting from installation and operation errors or improper use.

Parts list

Please ensure that you have received all of the following parts before installing the pickup:

PU 100 controller with pickup   2 Guitar cables, 1/4" plug   1 Spacing gauge

Mounting hardware for the PU 100 pickup
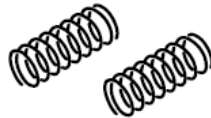
2 Button-head screws   2 Springs   4 Double-sided adhesive
(3x25 mm)   strips, (9x20 mm)

1 Pickup cushion   10 Spacer (5pcs 0,3 mm, 3pcs
(single-sided adhesive, foam)   1,0 mm, 2pcs 3,0 mm)

Controller mounting hardware

1 Countersunk screw (3x16 mm)   3 Double-sided adhesive strips   6 Cushion spacers
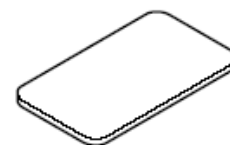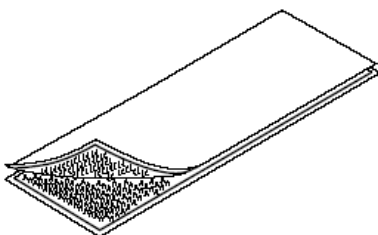
1 Velcro set   1 Bracket   2 Felt cushion
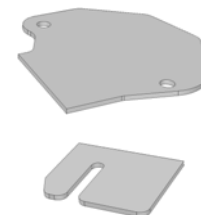
Connectors and controls

1. **Pickup:** this component converts the vibrations of the strings into an electrical signal that is processed by the PU 100 and sent to the AXON.

2. **Connector socket for the 13-pin cable (AXON AXK 100):** this is the signal output of the PU 100. Use the 13-pin cable to connect this socket to the INPUT socket on the AXON. The cable carries the signals of the individual strings from the PU 100 pickup as well as the signal from the conventional instrument output. The cable also carries power for the PU 100, as well as the control signals generated by the UP/DOWN buttons and the volume control on the PU 100.
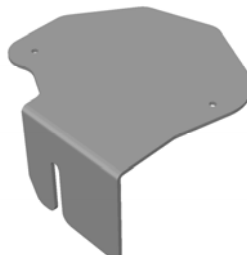
3. **Guitar input socket:** the PU 100 receives the signal from the conventional pickups of the instrument via this socket. Use one of the short cables supplied with the PU 100 to connect this socket to the 1/4" output socket of the instrument.

4. **3 status LEDs:** this LED indicates in which position the GUITAR/MIX/SYNTH selector is. Also you see that the PU 100 is receiving power from the AXON via the 13-pin cable.

5. **GUITAR / MIX / SYNTH selector:** this switch determines the signal to be sent to the AXON:

   - **G** (Guitar): the output contains only the signal from the conventional pickups (MIDI Volume is set to "0")
   - **M** (Mix): both the direct guitar signal and synthesizer signals (MIDI) are sent.
   - **S** (Synth): only the synthesizer signals (MIDI) are sent, not the conventional guitar signal.

6. **UP and DOWN buttons:** use these buttons to select different sounds and other functions while playing. Press the buttons as required to step through the presets of the AXON (and the corresponding voice numbers of the connected synthesizer). Press and hold the buttons to switch numbers without stopping.

7. **VOLUME**: this knob controls a voltage which will be translated by the AXON to the language of MIDI. In most cases it is set to volume but you can choose any MIDI CC in the AXON to control with this wheel. To adjust the volume of the conventional guitar sound, use the controls on the guitar itself.

Installation

While mounting the PU 100 on a guitar is not difficult, it does require great care and a certain degree of manual skill. If you are not sure you have the necessary skills, we recommend leaving the installation work to someone who has experience in modifying and repairing guitars.

Note: before installing the PU 100, be sure that the neck and the string height/intonation (bridge) of the instrument are set correctly.

Suitable guitars

The PU 100 can be used with most electric guitars as well as acoustic guitars with steel strings, with the following exceptions:

■ As the PU 100 is equipped with a magnetic pickup, it will not work with nylon or other nonmetallic strings.

■ The PU 100 is designed for 6-string guitars. The system cannot work correctly with 12-string guitars or unconventional string configurations.

■ The PU 100 pickup must be fitted between the bridge and rear pickup of the guitar. Installation is not possible if there is not enough room between the bridge and rear pickup or the body and the strings.
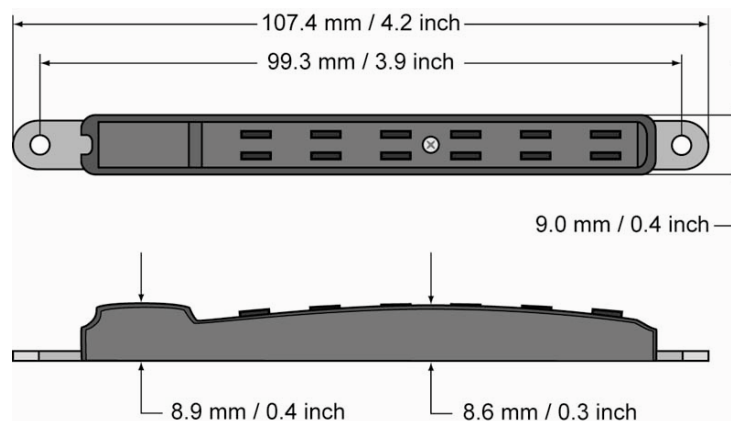
Installing the controller

Install the controller (interface) first – please ensure that the pickup is not damaged in the process.

Determining the optimal location

The controller (interface) should normally be installed behind the bridge. It should be within convenient reach, yet should not interfere with your playing or the controls of the instrument. Please observe the following points when determining a suitable mounting location:

- The controller should not be in your way when picking the strings. When installing the controller, ensure that it does not affect your playing style.
- The controller should not block the volume or tone controls of the instrument, or impede access to the bridge, especially the intonation screws that are adjusted from the back of the bridge.
- The mounting location must ensure that the length of the pickup cable and the connecting cable to the instrument are sufficient.
- Neither the controller nor the plug of the connecting cable should extend beyond the edge of the guitar body to reduce the risk of damage.
- When choosing the mounting location, ensure that the instrument can be placed on a stand with the controller attached.
- Choose the mounting location to ensure that the instrument will not be subjected to undue pressure while being transported in a bag or case with the PU 100 attached.

Selecting the mounting method

Choose the method best suited to your instrument and intended use.

Mounting with bracket

- Permits the mounting of the controller on a curved top.
- The bracket can be attached to the strap button of the instrument. This requires a certain amount of care to prevent damage to the strap button mounting screw, however.

**Mounting with screws and/or adhesive strips/pads**

- Permits the installation of the controller in conjunction with adhesive strips
- Permits simple mounting and secure attachment.
- Requires a hole to be drilled in the body.

Mounting with Velcro

- Permits the controller to be mounted and removed with ease.

Mounting with bracket

This mounting method has the advantage of not requiring screws to attach the controller to the instrument body. Before attaching the bracket to the instrument, mount the bracket to the controller as shown with two screws.
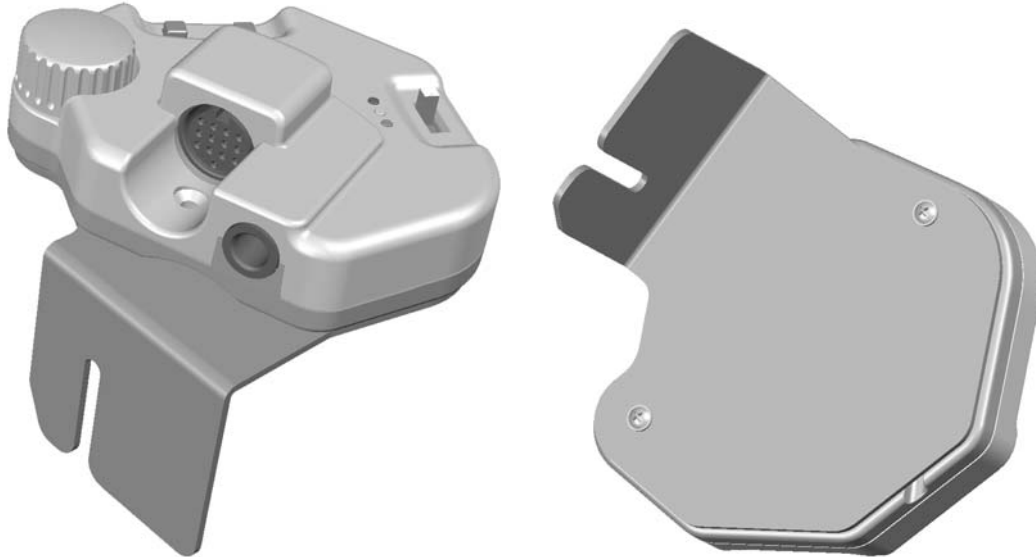
Apply the felt cushion to the bracket to prevent scratching the instrument's finish.

Now you can attach the bracket to the instrument with the strap button. Loosen the strap button of the instrument by unscrewing it a couple of turns and insert the slot of the bracket under the button. Tighten the screw to secure the bracket to the body.

CAUTION! The screw of the strap button can loosen due to repeated removal and tightening or strong pressure on the bracket.

Mounting with screws and/or adhesive strips/pads

Marking and drilling the screw hole for the controller

Hold the controller in the planned position and mark the center of the hole to be drilled (in front of the socket for the multi-pin cable) in the instrument body with a sharp pencil or other suitable tool. Set the controller aside and using the greatest care, drill a 2 mm dia. and 10 mm deep hole at the marked point.

Note: If your guitar is an acoustic or semi-acoustic instrument with a top unsuitable for drilling, or if you break out in a sweat already at the thought of mistreating your instrument in such a manner, then you can also install the controller with double-sided adhesive strips or Velcro. Screw mounting is the most secure, however, and we recommend it wherever possible.

1. Remove the protective backing from one side of the adhesive strip/pad and apply it to the underside of the controller.

2. Clean the mounting surface of the guitar thoroughly to ensure that the adhesion is not affected by dust, dirt or grease.

3. Remove the remaining protective backing from the adhesive strip/pads on the controller and place it on the guitar body in such a way that the screw hole in the guitar (if drilled) is aligned with the hole in the controller.

4. Press the controller firmly – but carefully – into place to ensure proper adhesion.

5. Finally, insert the self-tapping screw (3x6 mm) through the hole in the controller and into the hole previously drilled in the instrument. Ensure that the screw is only finger-tight. Over tightening the screw can damage the controller or the instrument.

Note:

■ The controller can be attached to practically any body type using the adhesive strips or pads.

■ Adhesives may react chemically with some instrument finishes, resulting in discoloration or other damage. If in doubt, apply a small piece of adhesive strip/pad in an inconspicuous location for several days to determine whether they affect the finish of the instrument.

■ If your instrument has a curved top or the installation location is shaped in such a way that the controller cannot be attached using adhesive strips alone, apply spacers to compensate for the uneven surface. Like the strips, the spacers also have adhesive on both sides which is protected by backing paper.

Mounting with Velcro

1. Cut the Velcro strips, which are attached to one another, into three sections and apply them to the underside of the controller.

2. Remove the protective backing from the other side of the Velcro strips and attach the controller to the guitar body.

3. The controller can now be gently pulled off and reattached to the body as needed.

Note:

■ This is not the most secure mounting method and should only be used if no other option is suitable, or if the pickup will be used often on different instruments.

Installing the pickup

Once you have mounted the controller to your instrument, attach the PU 100 pickup with double-sided tape or screws. Although adhesive tape is the most convenient method, we recommend screws, as these provide better seating and permit the height of the pickup to be adjusted. Regardless of the mounting method, the optimal position of the pickup must be determined first.

Marking the optimal mounting position

The PU 100 pickup must be mounted between the rear conventional guitar pickup and the bridge – ideally at a distance of 20 mm from the bridge. If not enough space is available to provide a spacing of 20 mm, ensure that the pickup is as far away from the bridge as possible (not more than 20 mm and no less than 10 mm). The end of the pickup with the cable must be positioned under the sixth (low E) string. Each of the six magnet pairs of the pickup must be aligned with one of the strings. The spacing of the strings may vary slightly from one guitar to the next, but the pickup will work correctly if the strings are above their respective magnets (it is not necessary to center them precisely). Ensure that the strings remain over their magnets even when bending them.
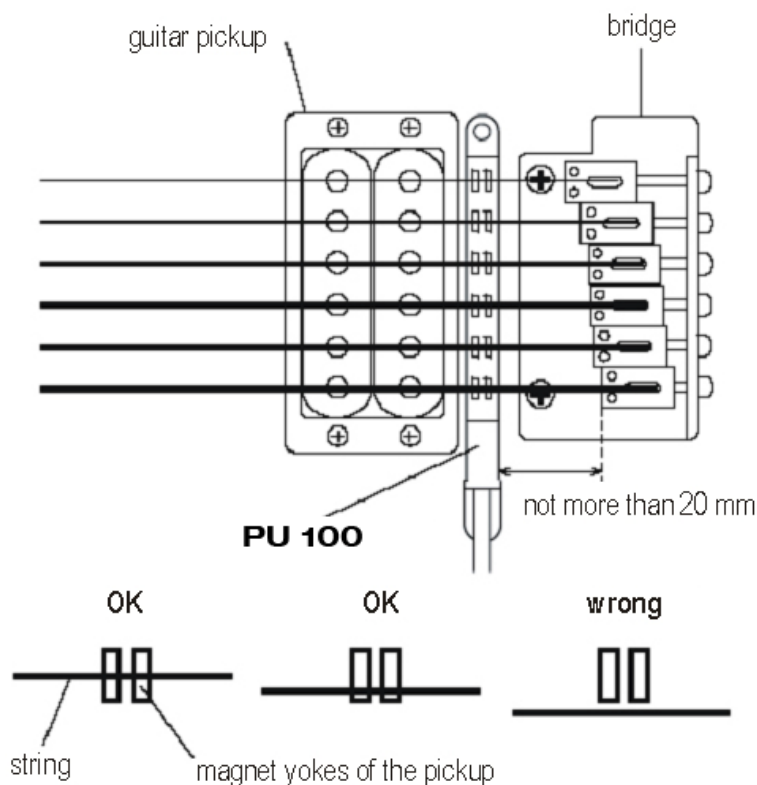
Note: Ensure that the pickup does not restrict the action of the tremolo arm, if present.

Once the pickup is correctly aligned, mark the centers of the screw holes with a sharp pencil or punch on the guitar top. If you do not want traces of the marking to remain on the top, use small pieces of marking tape instead of a pencil.

Selecting the mounting method

Mounting with adhesive strips

- Permits installation without damaging the body
- Requires more time and patience when setting the pickup height

Mounting with screws and springs

- Ensures easy adjustment of the pickup height
- Guarantees solid mounting of the pickup
- Requires holes to be drilled in the body!

Mounting with adhesive strips

1. Adjusting the pickup height

Once you have determined the optimal mounting position, prepare the installation. However, please note that the spacing between the strings and the pickup magnets are an important factor. The curve of the pickup magnets is adjustable and you must find a suitable compromise between the position and overall height of the pickup and the height of the strings. The distance between the upper edge of the magnets and the underside of the string should be around 1 to 2 mm when pressing the string to the highest fret. The spacing can also be less than 1 mm, as long as the strings do not touch the pickup when playing.

As the output level for the individual strings varies widely, you must set the input gain for the signals of the strings individually at the AXON Guitar-to-MIDI Converter after installing the pickup.

First ensure that the height of the strings (neck and bridge) is correct, then tune the strings. Increase the height of the pickup with spacers (see notes below) until the spacing between the top of the pickup and the underside of the strings is around 1 to 2 mm when pressing the strings to the highest fret. Use the included gauge to check the spacing.
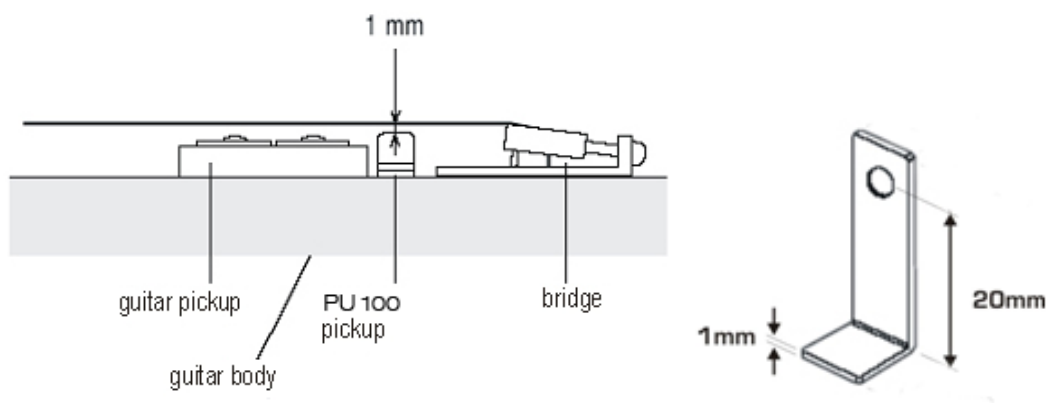
Note:

■ Do not initially remove the protective backing from the adhesive when adjusting the height of the pickup. The protective backing increases the thickness of the pickup pads and spacers by 0.1 mm – please take that into consideration when using multiple spacers.

■ If the mounting surface is not level – when applying the pickup to a guitar with a curved top, for example – add pieces of spacer shortened to one quarter or one third of their original length at either end of the pickup. The spacers can be cut easily with scissors.
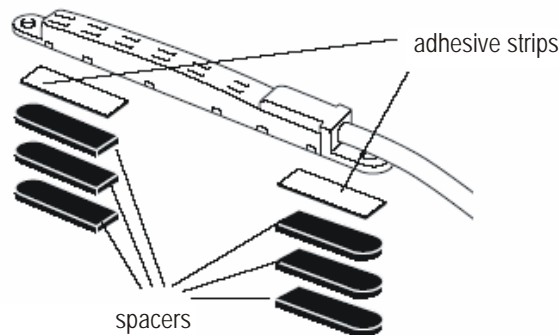
2. Attaching the pickup

Remove the strings from the instrument. Apply one layer of double-sided adhesive (multiple strips) to the underside of the pickup and remove the protective backing. Next, apply the required spacer(s) by removing their protective backing and applying them to the underside of the pickup. Carefully apply the pickup/spacer assembly to the marked location. Replace and tune the strings.
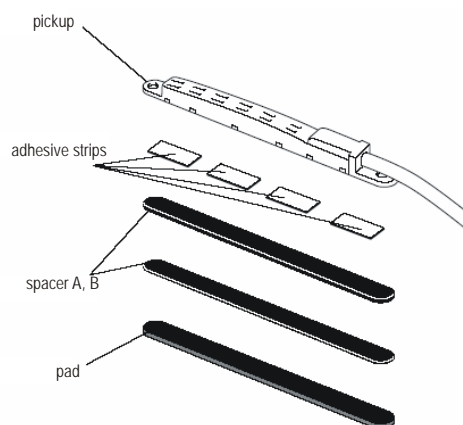
3. Checking the height of the pickup

Measure the height of the pickup again and play across the entire range of the instrument to ensure that the strings do not touch the pickup at any point. If everything is correctly set up, the installation is complete and the instrument is ready to play.

4. Changing the pickup height

Should it become necessary to change the height of the pickup, remove the strings and release the pickup from the instrument by inserting a thin, flat object such as the blade of

a small knife between the pickup and the top spacer. Gently lever the pickup off of the spacer.

The double-sided adhesive can be rolled off the underside of the pickup with a fingertip. Correct the height of the pickup by adding or removing spacers.

- When adding spacers to raise the pickup, remove the remaining double-sided adhesive from the existing spacer before removing the protective backing from the new spacer and applying it to the existing one.

- When removing a spacer to lower the pickup, remove the spacer together with its adhesive.

Next, apply a fresh layer of double-sided adhesive to the underside of the pickup and remove its protective backing. Carefully apply the pickup to the top spacer. Replace and tune the strings.

Mounting with screws and springs

Mounting the pickup with screws and springs has a number of advantages over adhesive mounting. Not only do the screws ensure that the pickup is securely positioned, they also permit the height of the pickup to be adjusted easily, without adding or removing spacers and adhesive strips.

Note: mounting with screws is only possible if a minimum space of 13 mm is available between the instrument top and the strings.

1. Drilling the screw holes

Remove the strings from the instrument and carefully drill two holes with a diameter of 2 mm and a depth of approx. 10 mm at the marked points. If the top is made of extremely hard wood such as maple, cherry or rosewood, it may be necessary to drill holes of a slightly larger diameter.

2. Mounting the pickup

Insert the self-tapping button-head screws (3x25 mm) through the screw holes in the pickup and the springs under the pickup. Fasten the pickup by threading the screws into the holes in the guitar top.
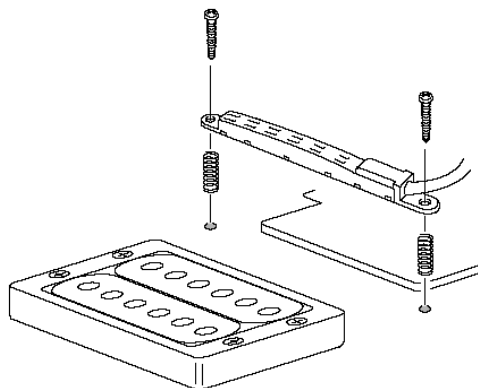
3. Replacing the strings and adjusting the pickup height

Replace the strings of the instrument and adjust the height of the pickup by turning the mounting screws. The distance between the upper edge of the pickup and the undersides of the strings should be around 1 mm when pressing the string to the highest fret. Use the included gauge to check the spacing.

Getting ready to play

Once the controller and pickup are installed, connect the PU 100 to your AXON Guitar-to-MIDI Converter. The 13-pin AXON AXK 100 cable, which is available separately, is required for this.

1. Connecting the instrument cable

Insert one jack of the instrument cable included with the PU 100 into the output socket of the guitar and the other jack into the input socket of the PU 100.

Note: connect the instrument cable even if you will not be using the conventional pickup sound. This connection is important for grounding the instrument to prevent noise and electric shock.

2. Connecting the PU 100 to the AXON

Ensure that the AXON is switched off, then connect one end of the 13-pin AXON AXK 100 cable to the appropriate socket of the PU 100 and the other to the INPUT socket of the AXON.

Note:

■ To prevent the 13-pin cable from coming unplugged or being damaged, we recommend running it between the strap and the body of the instrument.

■ To unplug the 13-pin cable from the AXON or the AIX 101/103, press the unlock button on the plug body.

3. Switching on the AXON

One LED of the PU 100 will light up when the AXON is switched on. The controller is now receiving power from the AXON.

4. Playing

The system is ready to play when the AXON, the synthesizer and other devices are properly connected and set up as described in their respective manuals.

Technical data

- Hexaphonic guitar pickup

- Volume knob

- Up / Down switch

- Signal select switch

- 3 LED status display

- 13-pin output jack

- 1/4 " normal guitar input

- Dimensions controller: 82,5 mm x 77,3 mm x 32 mm (W x H x D)

- Dimensions pickup: 107,4 mm x 9,0 mm x 8,9 mm (W x H x D)

- Weight: 70 g