COMPUTER CONTROL UNITS
ES16 / ES24 / ES32
USER GUIDE

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CAUTION: DO NOT ATTEMPT TO TURN ON YOUR COMPUTER UNIT UNTIL ALL OF THESE ASSEMBLY STEPS HAVE BEEN COMPLETED. ALL OF THE HARNESSES OR SHAFTS SHOULD BE TIED IN PLACE BEFORE THE UNIT IS TURNED ON.

1. ASSEMBLING YOUR BASIC LOOM

LIISA

EEVA

To assemble your loom you are best to have two people since you will need to position parts while holding the loom upright.

When you open your crate first find the following parts:

1. Two castle sides (the right side has the cogwheel warp advance system attached at the factory)
2. A back bottom brace (1 ½ x 4 ¾" with small holes in the middle and rectangular holes on the ends)
3. **EEVA:** One back top brace (1 x 3" with rectangular holes in the ends),
   LIISA: Two back top braces (1 x 3" with rectangular holes in the ends)
4. A front bottom brace (1 ½ x 4 ¾" with rectangular holes in the ends)
5. The warp beam (the one with straight teeth)
6. The cloth beam (the one with angular teeth)
7. The back and breast beam
8. A knee beam that looks like the back and breast beam
9. **EEVA:** Six wedges, **LIISA:** 8 wedges

The easiest way to start assembly is to position the right castle upright in a standing position. Lean against a chair or a wall. Slide the back bottom brace and the front bottom brace into the slots in the castle and slip in wedges on the outside of castle. Be sure that the straight side of each wedge is against the castle side. At this point do not pound the wedges in.

Now slide the warp beam through the hole at the rear of the loom that goes all the way through the castle upright. You may have to loosen the wing nuts on the worm gear so that it will disengage enough to allow you to slide the warp beam all the way through.
Slide the cloth beam into its hole toward the front of the loom. If your cloth advance lever was not preinstalled, you should install it before you slide the cloth beam in place.
Reengage the worm gear and tighten the wing nuts.

Finally place the top brace(s) through its hole in the top back of the loom and secure with a wedge on the outside.

Now raise the left castle side and slide all of the cross members into their appropriate holes. You may now secure the wedges by tapping lightly with the mallet provided.

Screw the U-shaped handle to the thread on the warp beam.

Your loom is now basically assembled except for the beater assembly.

2. ASSEMBLING THE BEATER

If you have an overhead beater, first mount the pieces with multiple ridges onto the top front of the castle sides (these are your beater pivot mounts). Use 4 of your 5" bolts and wing nuts for this purpose. (Note: these pieces may be premounted at the factory.)

Your beater consists of a bottom reed holder, a heavy top reed holder, two sides with adjustable screw holes in the top and slots in the bottoms, a 2 x 2 connecting top piece, and two small pivot pieces with pointed ends.

The bottom beater and top beater holders screw into the long holes of the flat sides using long bolts and wing nuts. The metal slides of the long holes should be facing rearward. Note that these slides allow you to adjust the top beater holder up and down to accept various size reeds. The top connecting piece goes across the top to secure the sides using bolts and wing nuts. The two small pieces screw onto the connecting piece using the holes predrilled. These pieces form the pivots for your beater.

Now you can lift your beater assembly and place it onto the loom dropping the pivot pieces into a set of ridges of the beater mounts.

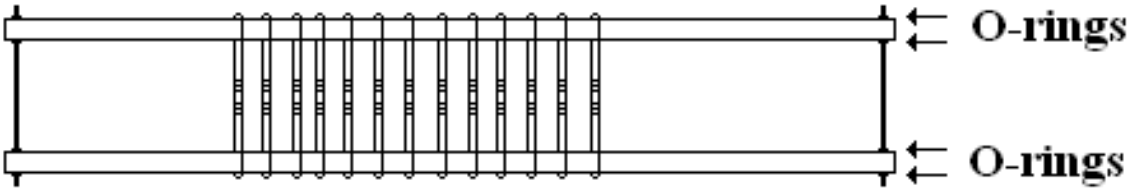
If you have an underslung beater, the assembly is basically the same except that your side pieces are the 1 ½ x 1 ½ boards with metal bars at the bottom. Assemble your beater holder and beater cap to the slides in the sides of the boards. The metal bars at the bottoms of your uprights should be positioned so that they are on the inward side of the uprights. The wing nuts on your beater cap should be on the back side of the cap.

After you construct your beater you drop it into the brackets on the bottoms of your outside castle sides. You may select the set of holes most comfortable for your weaving style. Secure the beater from the outsides of the castle using the two metal rods with flat ends and cotter pins. Push the round end through the holes from the outside and resecure on the inside with the cotter pin.

Finally you will find two rubber beater bumpers. You will also find a set of holes drilled on the castle sides just behind the reed area. Install one of rubber bumpers on each of your castle sides. Slide the bolt through the castle from the inside and secure with a washer and wingnut on the outside. Again, the hole you select depends on the most comfortable reed and beater position.

3. ASSEMBLING HARNESSES

The harnesses for your computer loom use the long thin slats with holes drilled through at both ends. They also use the thin steel rods with the indentations. Each harness uses two of the slats and two of the rods. You will also need the bag of small "O"-rings.



Place an O-ring on each of the inner indentations on one rod. Slide the rod through the holes of the slats until you hit the O-ring. Then slide a pack of one hundred heddles over the slats. Place the O-rings on the inner indentations of a second rod. Slide the second rod through the holes on the other side of the slats. Place another O-ring over each of the rods into the outer indentations to complete the harness. Repeat procedure for the other harnesses.

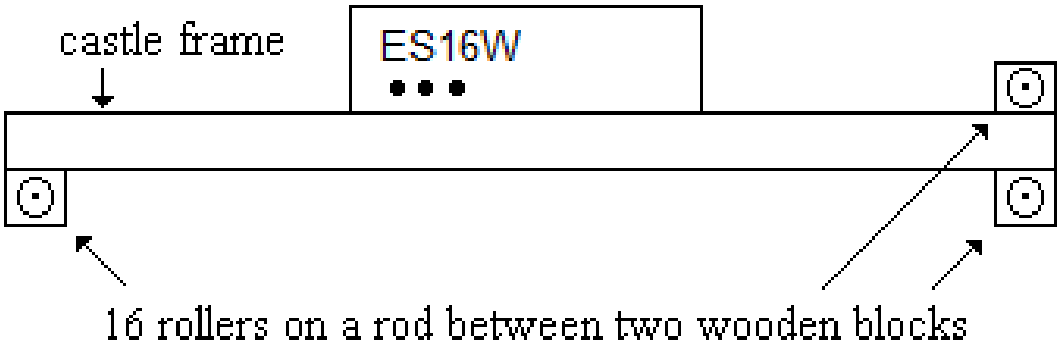
If you slide the upper middle O-rings a bit further down than the indentations, you will find it easier to move your heddles when they are still in bundles. This will make threading easier, too!

4. ASSEMBLING PULLEYS

Your computer control unit is mounted on two rails. Before you place the unit on top however, you must install the blocks, rods and pulleys to tie up your system, if not preassembled:

You should find six blocks with preplaced wood screws. Three of these blocks have holes all the way through and three have holes that don't go all the way through the block. Look along the underside and top side of the rails holding the computer box. You will see sets of predrilled holes at the ends of the rails.

The blocks with holes that are not drilled through should be placed on the front rail with the holes facing inward. The blocks with the holes all the way through should be placed on the rear rail.



After you have mounted your blocks, find the three long rods with cotter pins in them. Remove the pin from the rod and push the rod through the block on the back rail from the rear of the loom. The hole for the cotter pin should be at the rear - towards the back of the loom. After you have it all the way through the rear rail, count the same number of pulleys as you have shafts and thread the pulleys onto the rod. As you add pulleys, continue to push the rod forward toward the front rail. When you have added the total number of pulleys, push the rod into the hole of the front block. Now the hole in the rod for the cotter pin should be visible on the inside of the rear block and you can reinsert the cotter pin. This locks your pulley assembly into place.

Repeat this process for the other pulley assemblies.

5. MOUNTING THE COMPUTER UNIT

When handling the ES control unit, be careful not to damage the control module located underneath it.

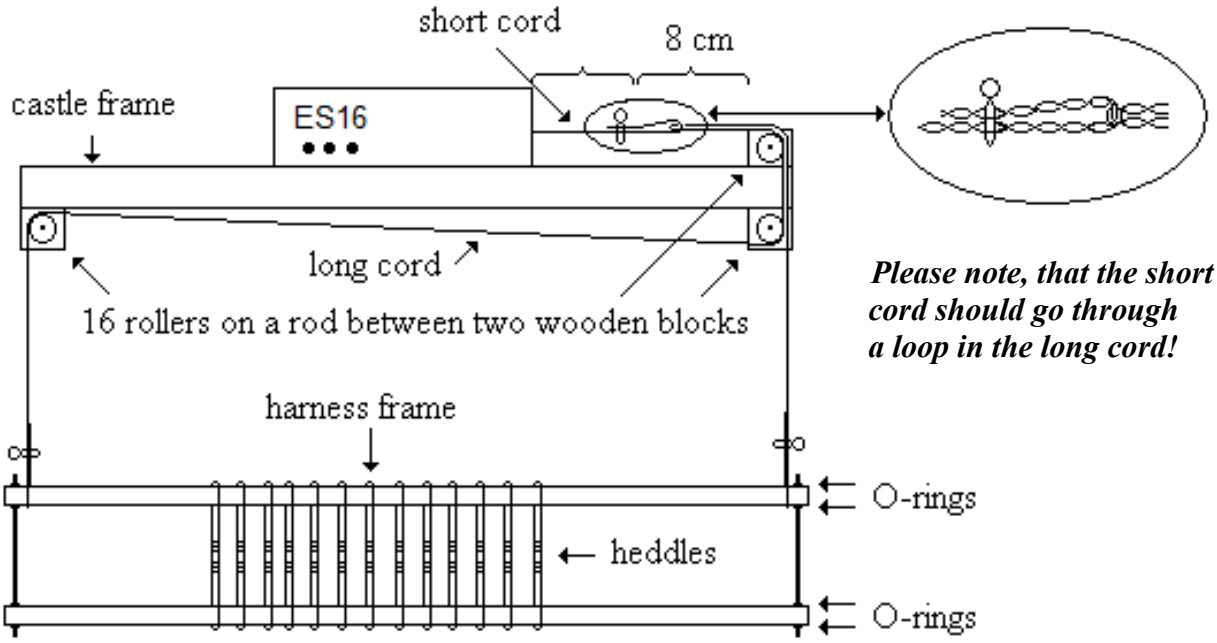
After you have assembled all the pulley assemblies, you can mount the unit on top of the loom. This is a two-person operation since the unit is heavy. Please be extremely careful.

Set the computer unit on top of the rails and screw it down from each corner.

The Control module is situated under the ES control unit.

6. HANGING THE HARNESSES

This is the most crucial part of your loom assembly. Each harness is hung from the top over and under the three sets of pulleys as shown in the diagram below.



We would first recommend that you get a roll of sturdy string and trace the movement of one harness hanging. This will allow you size the pieces of texsolv you will need to hang your harnesses. (Note: On some models, the texsolv is precut, so you can go directly to the harness hanging.)

Start at one end of the harness and then take the string over and under the pulleys to the place where the loop of the tie up meets the texsolv extending from the computer control box. The connection of the loop from the harness and the texsolv from the control box should be about half way between the pulleys and the control box. Do not tie up the loop closer than 8 cm from the control box. Then drop the string back over the right pulleys and to the other side of your harness. Be extra generous with the length of your string. You are going to use it to measure off your texsolv roll to actually hang the harness and you don't want to cut the texsolv too short.

Measure the length of your string and cut two of that length from the roll of texsolv provided. (You might write down the length of your string because you will be cutting all of your texsolv pieces to that length.)

HINT: Use your lease sticks to hold all of your harnesses in the loom. Place your lease sticks so that they suspend over the space between your back beam and your breast beam. Then hang your harnesses over the lease sticks so they hang in the approximate place where they will hang when your loom is tied up. Now you won't have to hold the harness in place with your hands.
Tie up your first harness using a precut piece of texsolv. Attach it to the control box texsolv using the arrow point connector and the method shown in the diagram. Tie the texsolv up your harnesses also using the arrow point connectors. Don't be concerned at the present time about leveling the harnesses, just make sure you have a few extra inches of texsolv on each end of the harness and you

will have no problem with leveling. (Note on the 32 shaft models, you will have eye hooks on the tops of your harnesses and the texsolv can be threaded through the hooks instead of around the harness bar.)

If the first cut piece of texsolv fits correctly, use your second cut piece as a guide to cut the rest of lengths of texsolv. Repeat the tie up process for all of the harnesses. Try to attach your loops to the control unit connectors at approximately the same place for all of the harnesses.

Once you have all of the harnesses connected, remove the lease sticks and let the harnesses swing freely.

7. LEVELING THE HARNESSES

After you have completed the installation of the harnesses, you can level them. First tie a piece of yarn over the breast beam and the back beam just as you would have a warp going through the harnesses. Now proceed to level each harness so that the yarn aligns about the bottom of the eyes of the heddles. Tie your harness sides at that point. Repeat for each harness.

If you care for symmetry in terms of the places where the arrow points align on your harnesses, you can readjust your tie ups and trim the ends of texsolv loops around the harness bars. That is not necessary however. Remove your yarn guide.

After you have all of your harnesses connected and leveled you can attach the rails of your computer control box to the top of your loom castle sides using wood screws through the holes in the rails.

8. CONNECTING THE ELECTRONICS

Note: Always switch off the control unit using the power switch before connecting or disconnecting cables or devices such as USB sticks and wireless mice to the control module.

Connect the USB-C cable coming from the bottom of the ES control unit to the power socket of the control module. This cable is disconnected for transport.

The Control module is situated under the ES control unit.

Connect the USB-C power cable to the control module.

The control box connects to the computer with an USB cable. The smaller end of the cable connects to the outlet in the back of the control unit and the bigger USB plug to your computer or laptop.

Connect the Mini USB cable to the control unit.

The electrical connection has two ends, a male and female. The female end connects to the outlet on the computer control box. The male end connects to a regular household receptacle.

After you do all the connections, you can turn on the unit by pressing the switch on the back of the unit and then turn on your computer. When you press your switch, you will hear your unit go “thump” and see the shafts move slightly. This is normal.

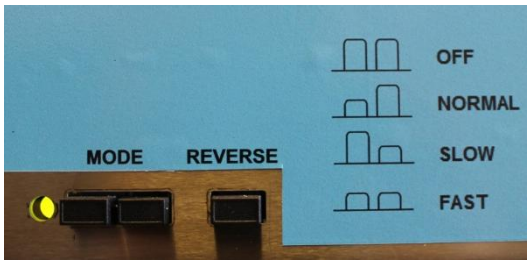
Please note that the unit should be turned on before the computer!

Now you are ready to warp your loom, program your computer, and weave.

9. THE BUTTONS ON YOUR BOX

Turning on the unit
There is a power switch on the back of the unit. When it is turned to the ON position, the ES will start up. Wait until the LED light next to the front buttons is lit green.

Shutting down the unit:
Press the Mode buttons so that they are in the upper position. Then press the pedal down until the LED light has turned off. When the light is off, you can turn off the device's power using the switch on the back.



The buttons allow you to control your weaving with a fast, normal or slow speed. Normal speed (the one typically used) allows you to open your shed with one click of the foot pedal and close it when you release the pedal. Slow speed allows you to open the shed with a click of the pedal and close it with another click. Fast speed, a setting useful mostly to production weavers, opens and closes the shed with one click of the pedal.

When both mode switches are in the up position, the control unit enters standby mode (OFF). In this state, pressing the pedal has no effect. If you press and hold the pedal for about 5 seconds until the LED indicator flashes, the error state will be cleared. In addition, if the direction button is ON, WLAN control is activated. If the direction button is OFF, USB control is activated."

The arrangement of buttons to achieve these speeds is indicated on the chart attached to your unit. Try each of them to determine which is best for your particular weaving style.

10. WAYS OF OPERATING THE CONTROL

ES devices can be controlled in three different ways:

1. Via USB connection with an external computer, for example with the WeavePoint program.
2. Via WLAN connection with an external device.
3. By connecting an external display (HDMI cable) and a wireless USB mouse to the ES device.

10.1 USB CONNECTION WITH AN EXTERNAL COMPUTER

The control program sends information about the shed to the control unit through the USB port (virtual serial port). This data defines which harnesses rise and which fall. When the shed opens after pressing the pedal, the control card sends either the next or previous row request to the PC

depending on the position of the direction switch, and the PC in turn sends the data of the next (or previous) weft row.

How to use this control option:

1. Start the ES device and the computer.
2. Connect the mini-USB cable to the USB-mini port on the back of the device and the other end to the computer's USB port.

3. Design/open a weaving pattern.
4. Open the weaving program such as WeavePoint and select the correct port.

10.2 WLAN CONNECTION WITH AN EXTERNAL DEVICE

With WLAN connection, control works like USB connection, but you don't need a separate program. The program works in several internet browsers. With this program you can open weaving patterns in WIF format, but you cannot design new ones.

How to use this control option:

1. Start the ES device and your smart device (computer, tablet, smartphone).

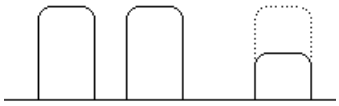
2. Check the WLAN ID and password on the underside of the ES control unit. On your smart device, connect to this WLAN network, which has the format ESxxxxxx.

3. Your smart device will notify you "No Internet connection" or something similar. Confirm on your device that you want to remain connected to this WLAN network anyway.

4. Open the internet browser on your smart device. Enter in the address bar: toika.local:8000 and press Enter.

5. Upload a WIF file from your smart device by pressing the Upload button.

6. Switch the ES device input from USB to WLAN by releasing the Mode buttons to the up position and pressing the direction button ON. Then press and hold the pedal until the LED light on the front of the ES device flashes. The ES device is now waiting for a signal via WLAN instead of USB. Note: If you want to switch back from WLAN control to USB, release the Mode buttons and the direction button, then press the pedal until the LED light flashes.



10.3 BY CONNECTING AN EXTERNAL DISPLAY (HDMI CABLE) AND A WIRELESS USB MOUSE

Note: Connect devices to the control module only when the control unit is switched off with the power switch.

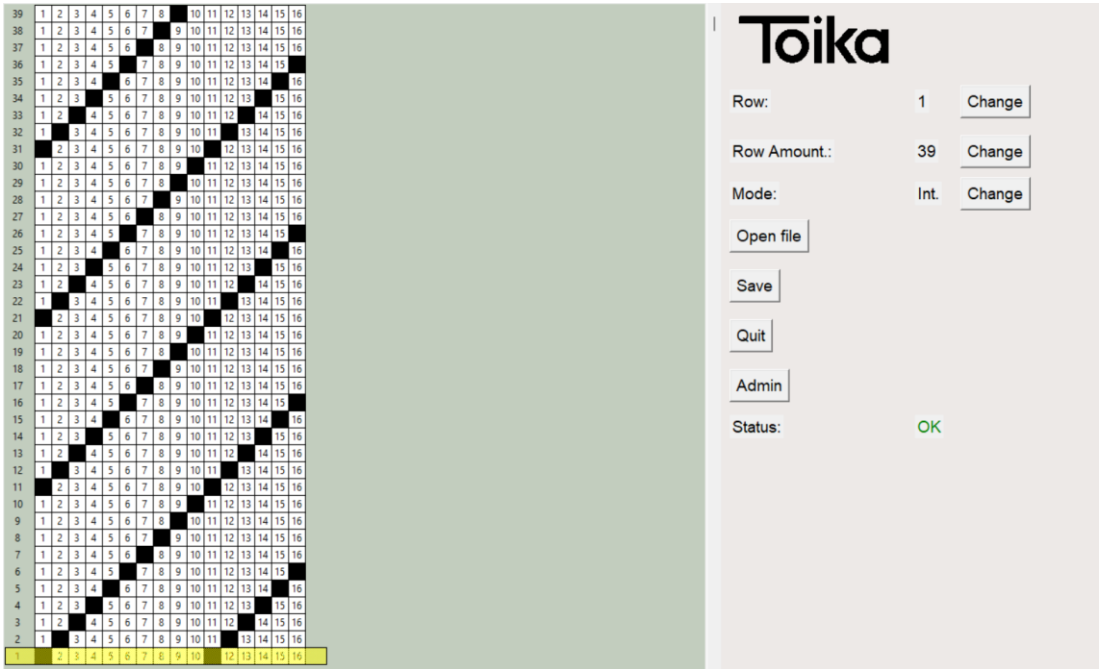
The control principle is similar to WLAN control, but with an external display and wireless mouse you can directly control the harnesses and save/open patterns in WIF format from a USB stick. In addition, you can copy patterns from USB or WLAN control.

How to use this control option:

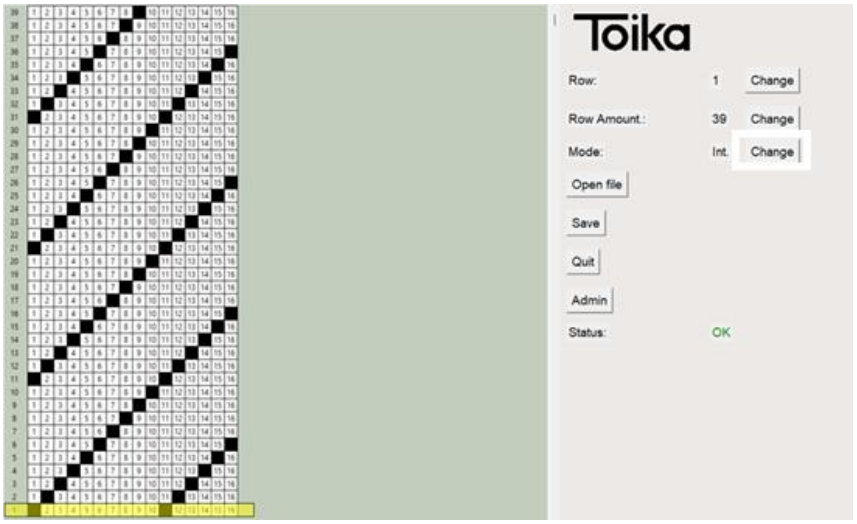
1. Connect the HDMI-micro cable to the control module under the ES device. You can use either port.

2. Connect the wireless mouse USB receiver to one of the USB ports on the control module under the ES device. If you want to use a USB stick for saving and opening programs, insert it into a free USB port.
   Note: Do NOT remove the USB stick while the device is powered on.

3. Start the ES device and the external display. Make sure the wireless mouse has batteries.
4. When the ES device has started, the following screen should appear.



From this view, you control the basic functions of the ES device. The most important function is the **Mode**. You can change the mode by clicking the **Change** button next to the word *Mode*.



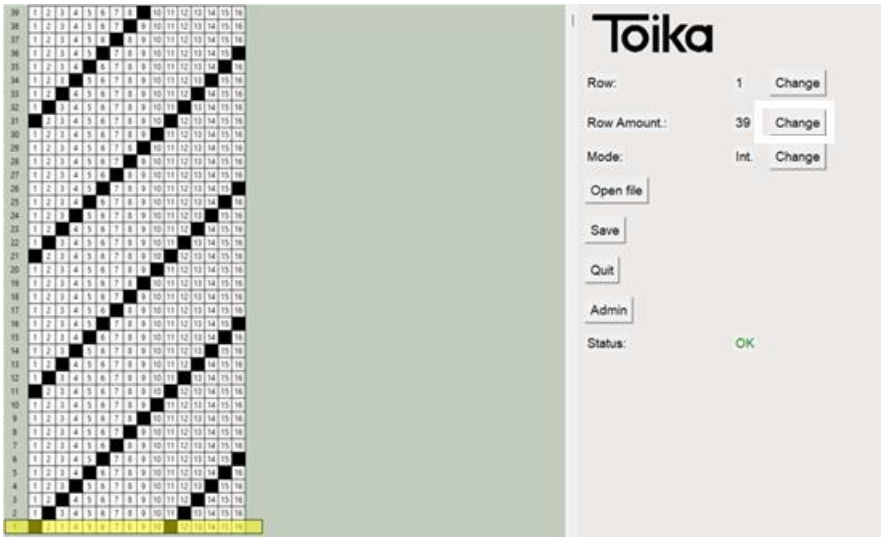
The ES device has the following control modes:

- **USB:** This is the default control mode. In this mode the ES device receives shed control data via USB cable from the computer or via WLAN from a smart device.

- **Test:** If the device does not receive shed control data in USB mode, it switches after 5 empty rows to Test mode, where it raises first shafts 1 and 16, then 2 and 15, and so on, until it switches to plain weave (every other shaft up). Test mode automatically switches back to USB mode when control data becomes available again.

- **Copy:** This works like USB mode, but as the pattern progresses, it is also drawn on the diagram view. This way, the pattern you are weaving is recorded here as well. If you want the pattern to be copied exactly as it is, adjust the row count to match your pattern. Do this by pressing the **Change** button next to *Row Amount* and entering the desired row number.

When you stop the control by pressing **Quit**, the ES device saves the displayed pattern into its internal memory. This pattern opens automatically the next time you start the device. If you want to continue weaving this pattern after restarting, set the control mode to **Int.**



- **Int.:** In this control mode the ES device does not request rows from an external device but repeats the program shown on the display. You can click on squares to define which shafts go up and down in each row. If you have a USB stick inserted into the ES device, you can save the pattern onto it with the **Save** button. You can also open patterns in WIF format from the stick with the **Open file** button. When you stop the control by pressing **Quit**, the ES device saves the displayed pattern into its internal memory. This pattern opens automatically the next time you start the device. If you want to continue weaving this pattern after restarting, set the control mode again to **Int.**

11. MAINTENANCE OF THE CONTROL UNIT

CLEANING THE OUTSIDE

Turn off the power from the control unit and the computer before you start. Wipe the unit with a slightly moist or dry cloth. Make sure not to use too much water.

CLEANING THE INSIDE

Turn off the power from the control unit and the computer. Remove the control unit's electric cable from the wall socket and the connecting cable between the computer and control unit before starting. Remove the cover of the control unit by lifting it upwards. Use a vacuum cleaner to gently remove the dust inside the unit. Wipe the metal slide bars clean with a dry cloth and spread some sewing machine oil on the slide bars with a clean cloth. Be sure to be careful so that the oil won't spread elsewhere.

TROUBLE SEEKING

TROUBLE	POSSIBLE CAUSE
The front panel LED light does not turn on even though the ES control unit is powered.	USB-C cable is disconnected from the control module, see section 8.
A shaft does not rise.	The harness cord is loose or the holder is detached.
A shaft does not lower.	The shaft is resting on top of another shaft.
A shaft rises together with the adjacent one.	Harness cords are crossed, or the pegs are stuck together.
The shed does not open.	Overload, fuse has blown, or weaving mode is incorrect.
The shed does not close.	Overload, fuse has blown, or weaving mode is incorrect.
Operation stops during weaving.	Motor overload or fuse blown.
No shaft lowers for more than 5 lifts and the front panel LED is green.	Magnet fuse has blown. Contact info@toika.com.
The front panel LED is orange.	The ES control unit is not receiving control data from the external device. USB control: Check that the USB cable is connected, the computer's weaving program is in Weaving mode, and that the correct port is selected. Restart the weaving program if necessary. Switch back to USB if you changed to WLAN after startup (see 10.2). WLAN control: Check that you are connected to the ES control units WLAN network and that the bottom of the external device's browser view shows "connected". If the WLAN connection is lost during weaving, restart the ES control unit with the main power switch and then switch to WLAN connection (see section 10.2).
The front panel LED is red.	The ES control device is in error mode. Release the mode buttons up and press and hold the pedal for approx. 10 seconds. If the red light remains on, turn off the device with the power switch and restart it after about 10 seconds. If the light still turns red, contact info@toika.com.
The shed opening always remains incomplete.	A shaft cannot rise because a peg is too close to the end of the device, or the warp tension is too tight.
The shed does not match the row shown on the screen.	The computer weaving program settings are incorrect.
A cord often slips off the roller.	A peg is too close to the roller.
A shaft rises unevenly.	The cord of the adjacent shaft has jumped onto the roller of the tilted shaft and blocks the cords movement, or the short cord coming from the control unit is not threaded through the long cord.
Save or Open button in Int. control mode does nothing.	Check that a USB stick is inserted in the control module.
After pressing the Open button in Int. control mode, an empty view appears (no patterns available).	Check that the pattern saved to the USB stick is in WIF format.