

HS-DOI Keyboard Piano.

Learning kit assembly manual



Product introduction

The Keyboard Piano is an intelligent kit composed of components such as collision sensors and passive buzzer modules.

This kit utilizes seven collision sensors to generate square waves of different frequencies, which are then sent to the passive buzzer module. This creates the effect of playing the do, re, mi, fa, so, la, si musical scale, simulating the playing style of a piano.

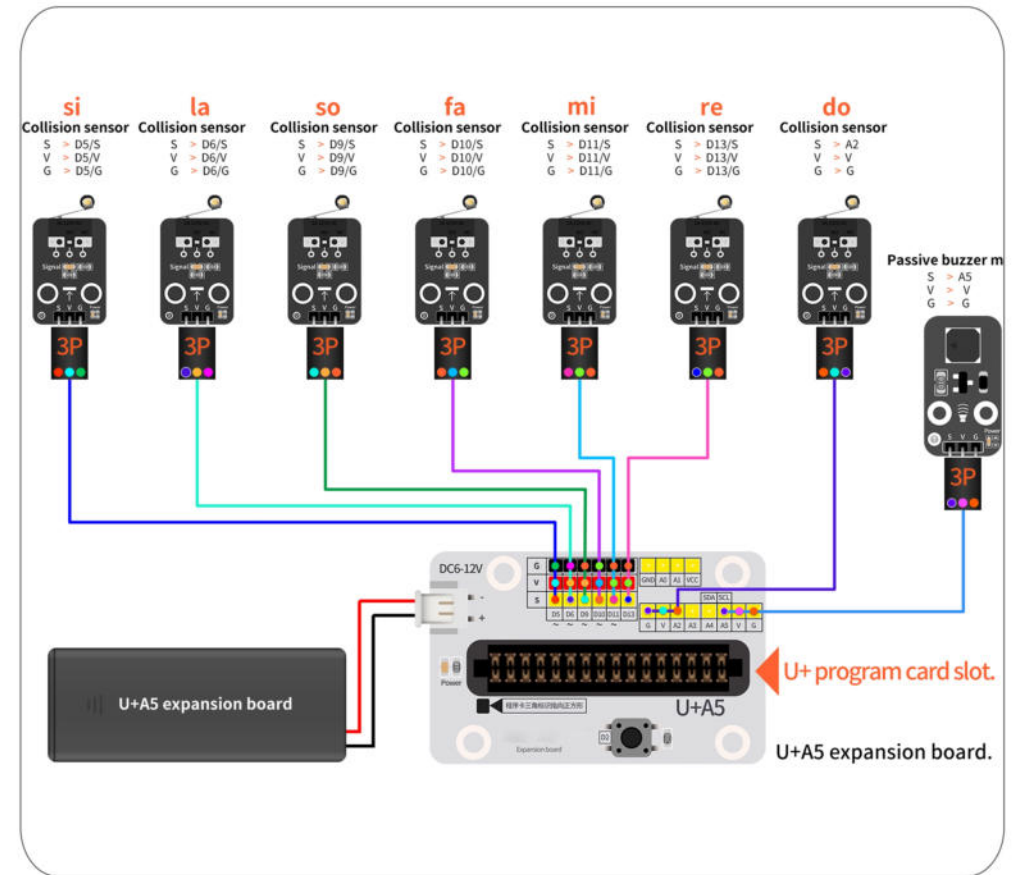
This product must be equipped with a U + program card.
(U + PROGRAM CARD) Use
U + PROGRAM CARD SUPPORTS ARDUINO IDE, MIXLY, ARDUBLOCK, SCRATCH AND OTHER PROGRAMMING

Preparation tools and assembly precautions

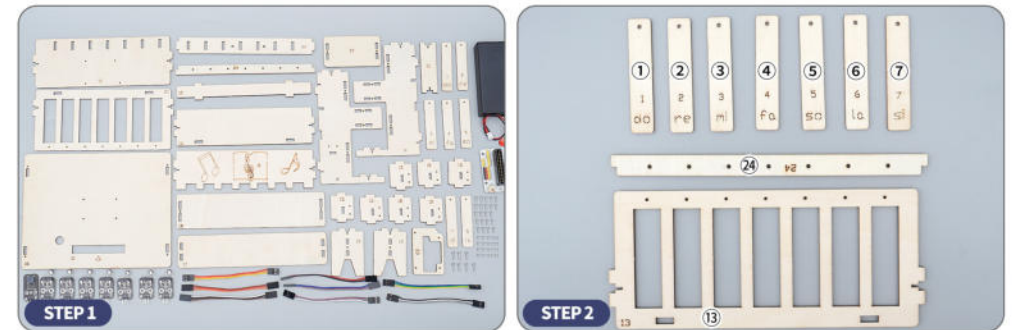
Bring your own assembly tools: a cross screwdriver, a pair of scissors.
Bring your own debugging tools: 1 computer with Windows 7, 8, 10, and 11 operating systems, 1 U + program card, 1 micro usb data cable, and a pair of 18650 lithium batteries.
If you want to easily assemble the kit, you need to read the assembly instructions carefully and assemble it step by step.



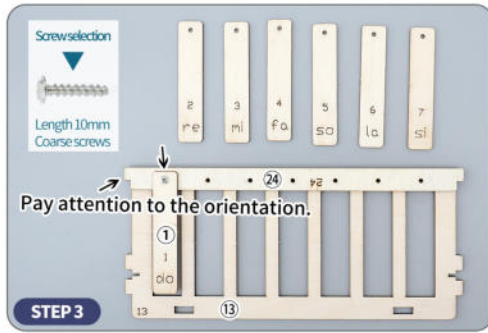
Warning: Persons under the age of 14 must use it under the guidance of a professional teacher or an adult with relevant knowledge! The assembly and debugging of this product require the use of relevant tools. Please take safety precautions when assembling to avoid injury! This product is a teaching experiment product, please do not use its function as a routine product, there will be instability! When you are not using this product, please turn off the power switch on the battery case and remove the battery, and keep the battery properly!



● Circuit wiring reference diagram.



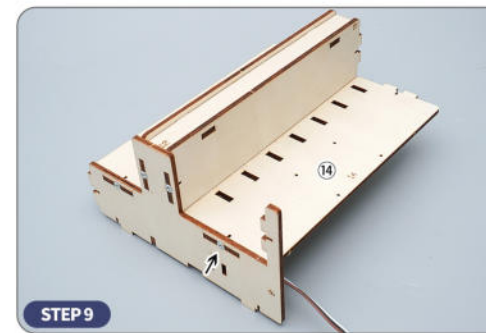
- Prepare all the components and wooden materials. When assembling the wooden materials, please carefully check the numbers on each piece. **The side with numbers is the front side, while the side without numbers is the back side.**
- Prepare boards labeled as ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑬, ⑲.



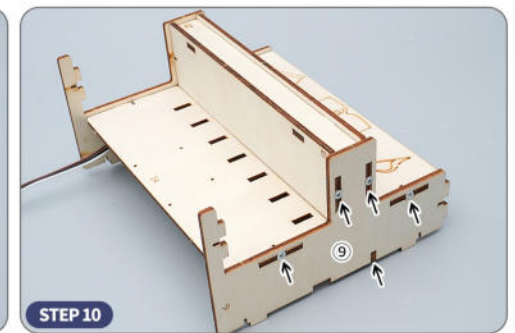
- Install board labeled as ① and ②④ onto board labeled as ⑬ using 10mm coarse-threaded screws.



- Install boards labeled as ②, ③, ④, ⑤, ⑥, and ⑦ in sequential order onto boards labeled as ②④ and ⑬ using 10mm coarse-threaded screws.



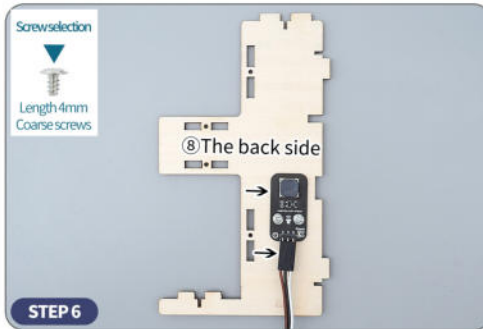
- Install board labeled as ⑭ onto the back side of board labeled as ⑧ using a 7mm coarse-threaded screw. (Pay attention to the installation orientation.)



- 把⑨号板安装在⑩、⑪、⑭、②④号板上，然后用7mm粗纹螺丝固定住。(注意安装朝向)



- Install board labeled as ⑬ onto board labeled as ⑫, and then install board labeled as ⑩ onto board labeled as ⑫.



- Install the passive buzzer onto the back side of board labeled as ⑧ using 4mm screws, and then plug the 3-pin DuPont wire (10cm) into the passive buzzer.



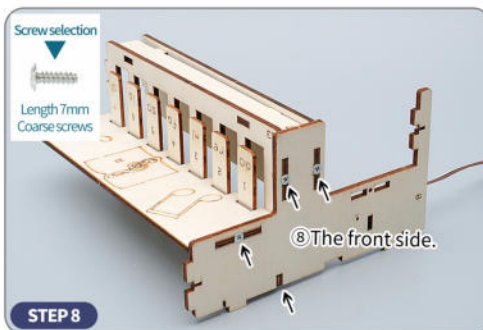
- Install board labeled as ⑱ onto boards labeled as ⑧ and ⑨ using 7mm coarse-threaded screws.



- Install board labeled as ⑰ onto boards labeled as ⑧ and ⑨.



- Align board labeled as ⑪ with boards labeled as ①, ②, ③, ④, ⑤, ⑥, ⑦, and ⑬, and firmly hold it in place with your hand.



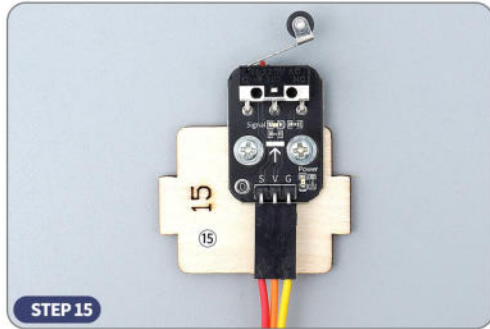
- Install boards labeled as ⑩, ⑪, ⑬, and ②④ onto the back side of board labeled as ⑧, and secure them in place on the front side of board labeled as ⑧ using 7mm coarse-threaded screws.



- Align and place board labeled as ⑳ onto board labeled as ⑭.

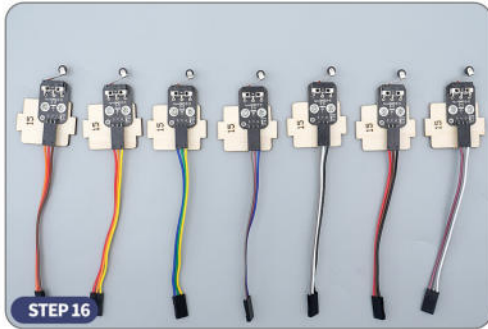


- Install U+A5 expansion board onto boards labeled as ⑳ and ⑭ using 7mm coarse-threaded screws, and then attach the red keycap onto the expansion board.



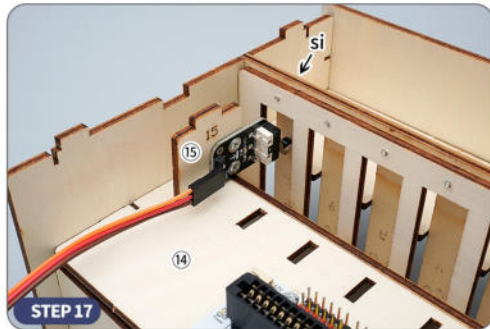
STEP 15

● First, install the collision sensor onto board labeled as 15 using 4mm coarse-threaded screws. Then, insert one end of a 3-pin DuPont wire into the collision sensor's ports labeled as S, V, and G.



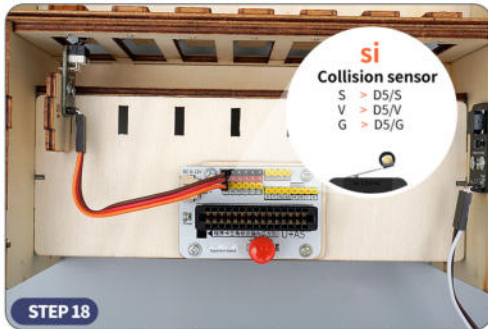
STEP 16

● Please install the remaining board labeled as 15, the collision sensor, and the 3-pin DuPont wire (10cm) following the steps outlined in STEP 15.



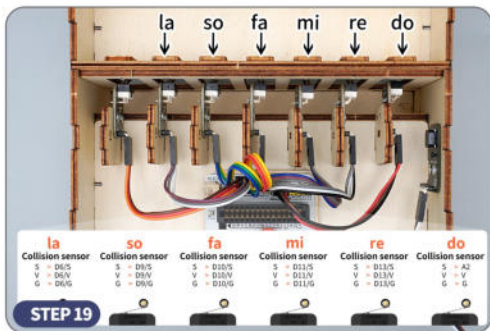
STEP 17

● Install the assembled board labeled as 15 onto the slot on the back side of board labeled as 14. (Pay attention to the installation orientation and the order of the musical notes.)



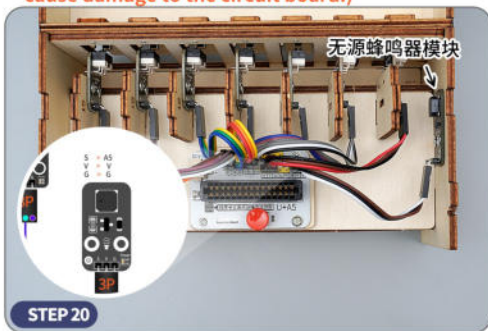
STEP 18

● Refer to the "Circuit Wiring Diagram" and insert the DuPont wire from the collision sensor into the interface labeled as [D5] on the expansion board. (Please double-check the wire sequence before inserting it. Incorrect wire sequence may cause damage to the circuit board.)



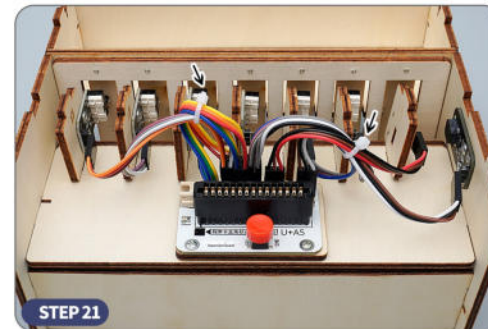
STEP 19

● Please refer to the "Circuit Wiring Diagram" as well as STEP 17 and STEP 18 to sequentially install the remaining assembled boards labeled as 15 onto the back side of board labeled as 14. Insert the DuPont wire ports in the order of the musical notes into the interfaces D6, D9, D10, D11, and D13 on the expansion board. For the "do" note, insert it separately into the G, V, and A2 interfaces.



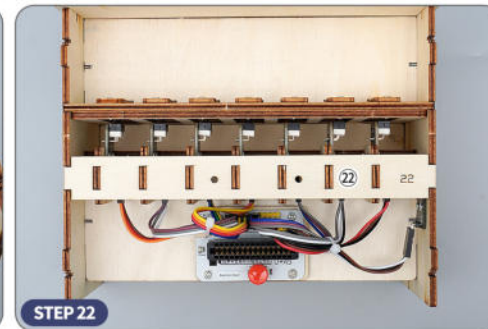
STEP 20

● Refer to the "Circuit Wiring Diagram" and insert the DuPont wire ports of the passive buzzer module into the interfaces labeled as [A5, V, G] on the expansion board.



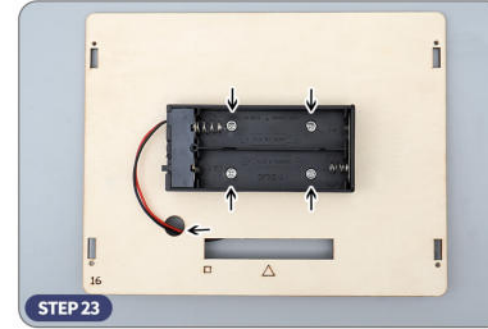
STEP 21

● Organize all the DuPont wires neatly and secure them with cable ties. Then use scissors to trim off any excess cable ties. (Note: Please exercise caution and prioritize safety when using scissors to avoid any injuries.)



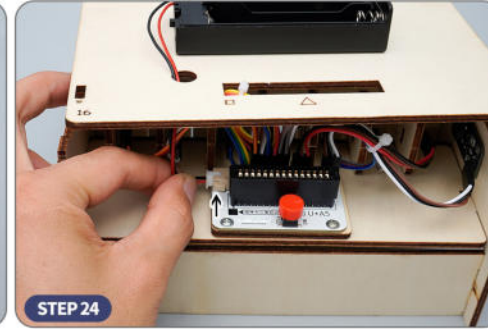
STEP 22

● Align the board labeled as "Number 2" and slot it into the designated slots on the seven boards labeled as "Number 15" and "Number 8" and "Number 9". (Note: Pay attention to the installation orientation.)



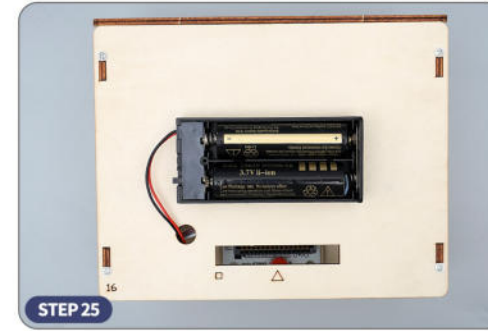
STEP 23

● First, remove the battery box cover. Then, use a 4mm coarse-thread screw to install the battery box onto the board labeled as "Number 17". Thread the battery box wires through the wire holes on the board labeled as "Number 17".



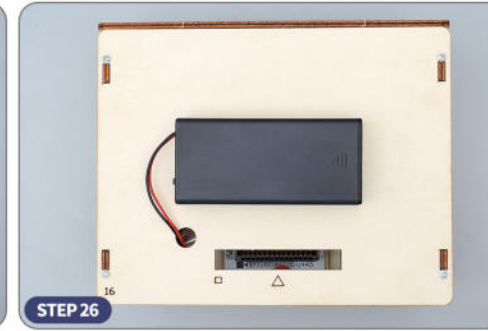
STEP 24

● Refer to the "Circuit Wiring Diagram" and insert the battery box wires into the power interface of the U+A5 expansion board.



STEP 25

● Insert the 18650 lithium battery into the battery box. Then, use a 7mm coarse-thread screw to install the battery box labeled as "Number 17" onto the boards labeled as "Number 8" and "Number 9".



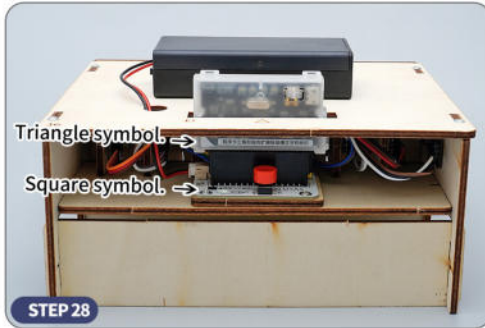
STEP 26

● Cover the battery box with its lid.



STEP 27

- Select the corresponding development board (Arduino AVR or Arduino UNO) and set the COM port in the Mixly software. Open the corresponding example program and upload it to the U+ program card.



STEP 28

- Insert the program card into the slot on the expansion board. Pay attention to the orientation of the program card, where the triangle symbol on the program card should align with the square symbol on the expansion board's slot.



STEP 29

- Use 7mm coarse-thread screws to install two 19 boards on both ends of the 21 board.



STEP 30

- Use 7mm coarse-thread screws to install the 20 board onto the two 19 boards.



STEP 31

- The button piano assembly is complete! You can start playing by turning on the power.

After the assembly is completed, you also need to check whether it is installed correctly to avoid danger during debugging!



1. Carefully check whether the entire kit has the wrong accessories. If there are wrong accessories, the entire kit will not function normally.
2. Carefully refer to the circuit connection reference diagram to check whether the wire connection is correct. Wrong wire connections can lead to circuit short circuits, burn electronic components, and seriously lead to dangerous situations such as fire and explosion.
3. Carefully check whether the pins at the bottom of the circuit board accessories are in contact with other metals. If there is any contact, please check whether any accessories are not installed, resulting in the circuit board not being isolated from other metals.
4. Please check the power supply type of this kit and the battery model used. Wrong use of the power supply or battery can lead to dangerous situations such as fire and explosion.
5. If you encounter any problems you don't understand, please contact the online customer service of the official service website or consult relevant professionals during working hours from Monday to Saturday from 9:00-18:00. Do not operate blindly, otherwise it will be dangerous.

Refer to the process below to debug the kit.

Download and install the U+ program card driver on the computer, and install the programming software.

Download the sample program to the U+ program card using the data cable.

Insert the U+ program card into the expansion card slot of the kit.

Turn on the power switch of the kit and the kit starts to work.

During debugging, you may encounter the following problems. Please refer to the following prompts to see if you can troubleshoot!



1. Check whether the wiring is loose or wrong, please refer to the circuit wiring diagram for details.
2. Check whether the battery has insufficient power, and it is recommended to replace it with a new battery.
3. Check whether the DuPont cable of the sensor and the expansion board is connected correctly, please refer to the circuit wiring diagram.
4. Check whether the U+ PROGRAM CARD program card has downloaded the program.
5. Check whether the U+ PROGRAM CARD program card is inserted upside down. Inserting upside down will cause a short circuit. Please refer to the card insertion method of [STEP9] to insert the card.