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- 1 Features standard Humanoid robot assembly demo (adjust gait automatically while walking)
- 2 Features more than 29 robot assembly demos and basic programs.
- 3 Features multiple sensors of posture testing, distance measuring, light detecting etc.
- 4 Features remote control (standard bluetooth communication module inside)
- 5 Features graphical programming software, the "VJC-HRobot"

# I Preparation

## 1-1 Guidelines for Use

Please follow these guidelines when building and operating the humanoid robot.

- Before you begin, please read the Quick Start guide carefully.
- Do not use dangerous instruments, for example, knife or drill.
- While debugging or running the robot, do not put your face close to it.
- Do not put your finger in robot joints.
- Do not disassemble or modify the components.
- Make sure you use the battery and charger provided in the kit.

## 1-2 Kit Components

### Intelligent Motor H-M24



- Driving joint of the robot
- RS485 communication protocol. Bus control. Up to 254 intelligent motors connection
- The maximum torque is 24kgf.cm  
Support 360 degree rotation mode

### Battery



- Power supply for the robot
- Lithium-polymer battery & protective shell (11.1V)

### Integrated Sensor H-S100



- Sensing module of the robot
- Integrated sensor:  
3 distance measuring sensors,  
3 brightness measuring sensors,  
One sound detecting sensor,  
One buzzer

### Controller H-CON101



- Control center of the robot
- Supports the storage of two programs

### Remote Control



- Send control commands to the robot
- Standard blue-tooth communications protocol

### Charger

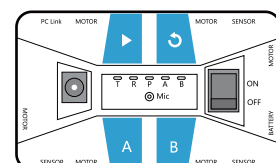


- Power supply
- Output: 100-240V

### Data Cable



USB data cable



Parts (Not to Scale)



P1



P2



P3



P4



P5



P6



F1



F2



F3



F4



Tire



Wheel



T1



T2



T3



LH



SH



S5



S3



S4



S1



S2



S6



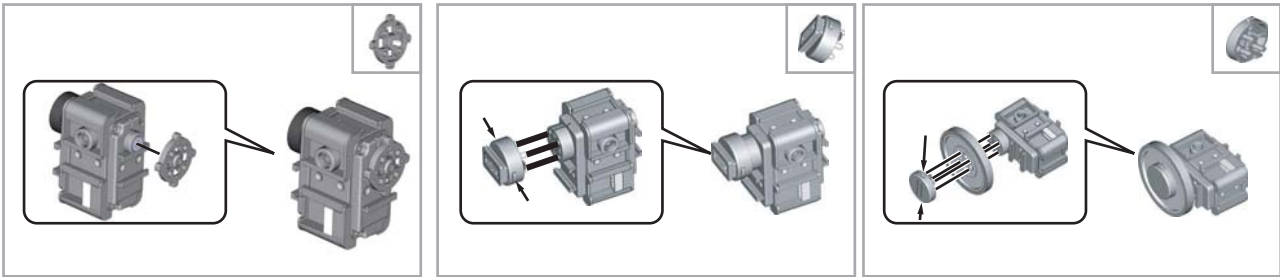
CABLE-12



CABLE-21

# 1-3 Assembly Manual

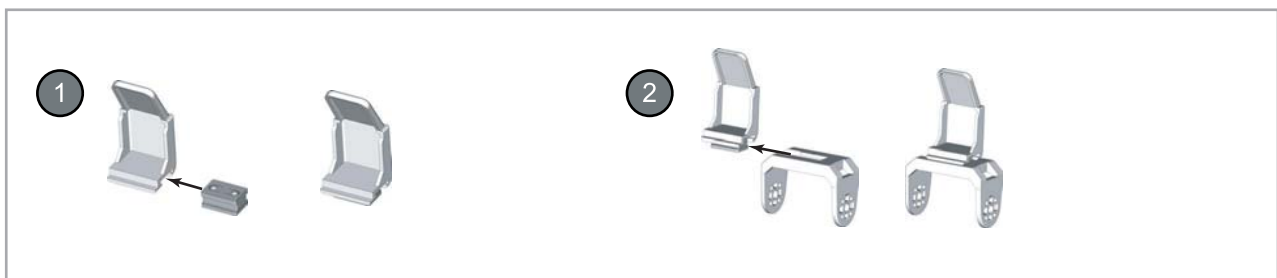
## Motor drive examples



## Motor in frame

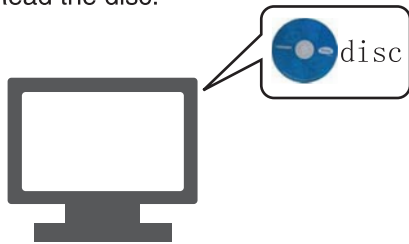


## Claw assembly

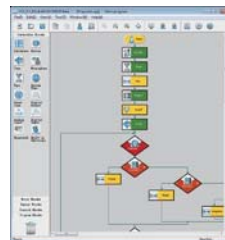


# 1-4 Install the programming software

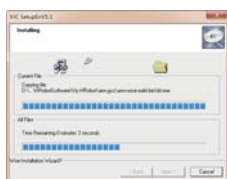
Read the disc.



Run the installation program.



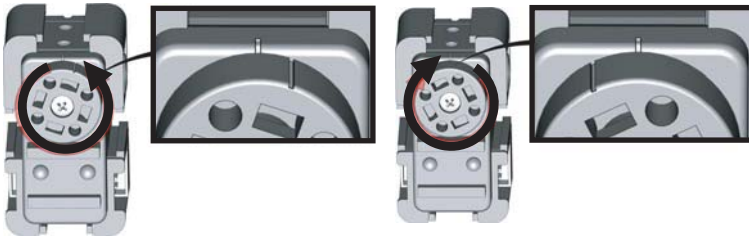
Click on "Next" several times until the installation is complete.



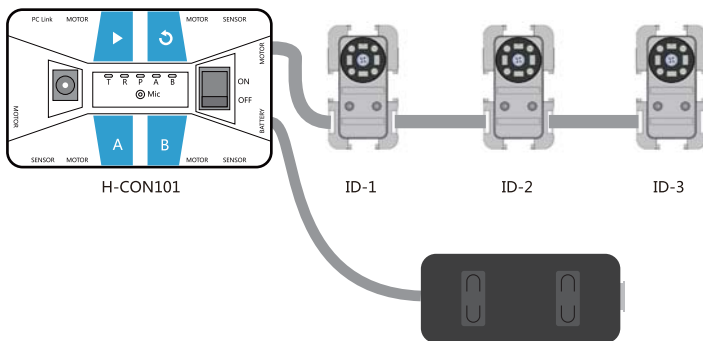
# II Build a Humanoid Robot

## 2-1 Before Building

- 1 Select the intelligent motors. Note that the drive trays are not at the zero position in the picture.

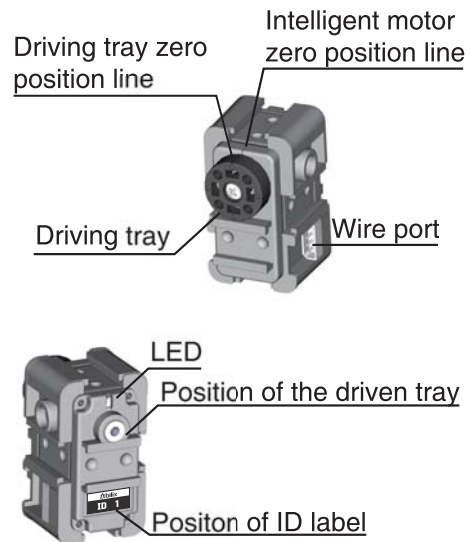


- 2 Connect the controller, battery and intelligent motors together.

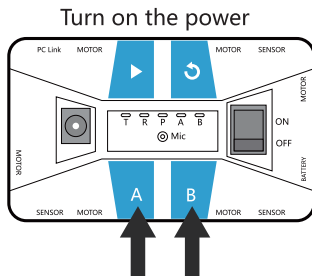


When intelligent motor works, it can rotate to different angles, which are corresponded to the zero position.

The zero position is where the intelligent motor starts to rotate back and forth. While building the robot, you need to adjust the notch on the driving tray to the zero position. This is called "Aligning to the zero position" or "Zero position adjusting". After adjusting to the zero position, the intelligent motor will start to rotate at the right place, otherwise, the robot joints would be misplaced. Please make sure to adjust.

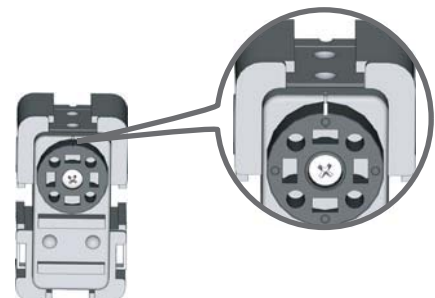


- 3 Turn on the controller, press both A and B buttons. When all the intelligent motors are at the zero position, release the A and B buttons.



The notches will be on the same line after turning to the zero position.

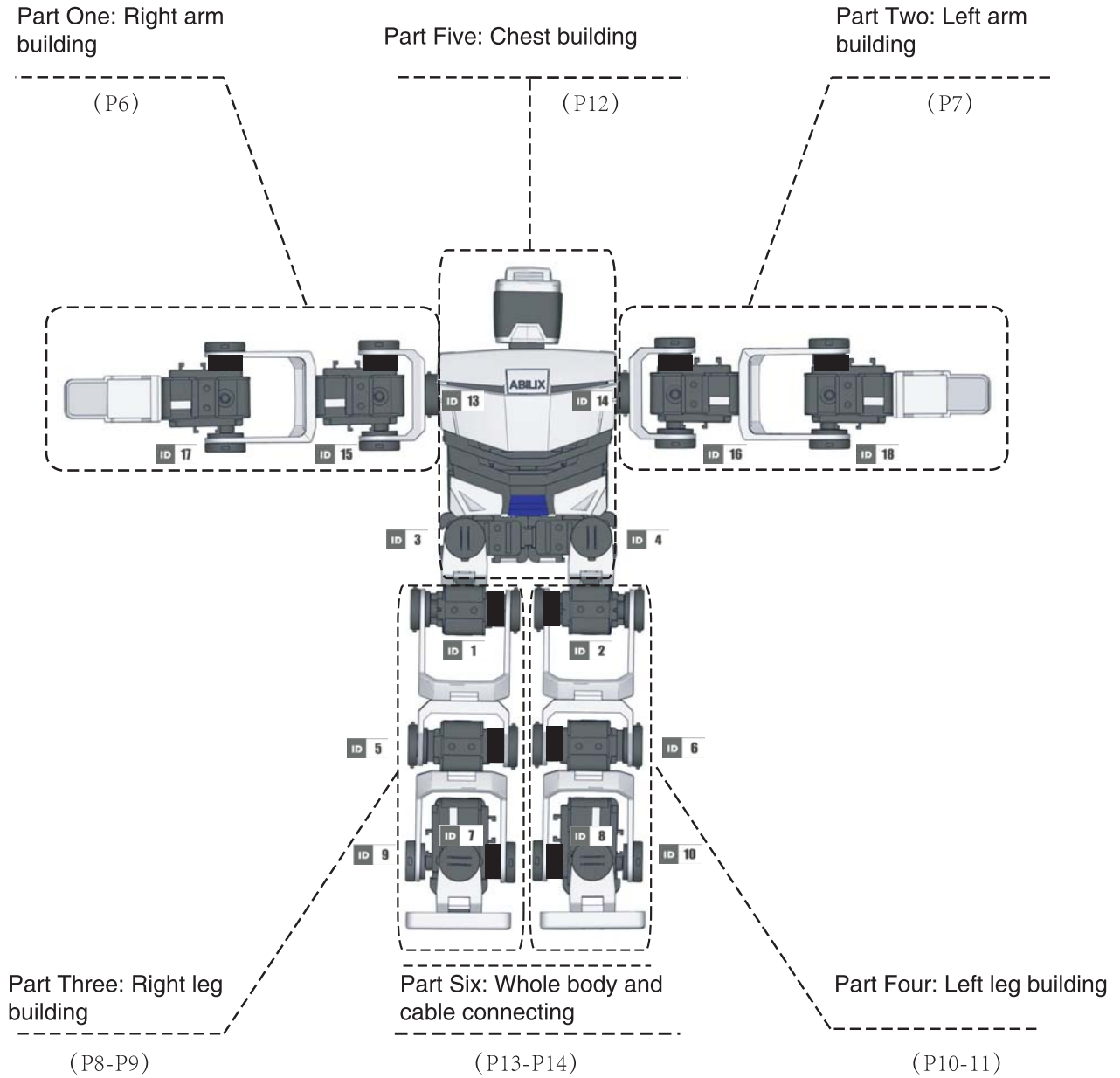
- 4 Remove all intelligent motors. Turn off the controller and . The motors are now ready to use in building a model.



## 2-2 Building Process



While assembling, pay attention to the ID number of different intelligent motors. Do not rotate the driving tray while building. Pay attention to the position of driving trays which are marked in the black frame.

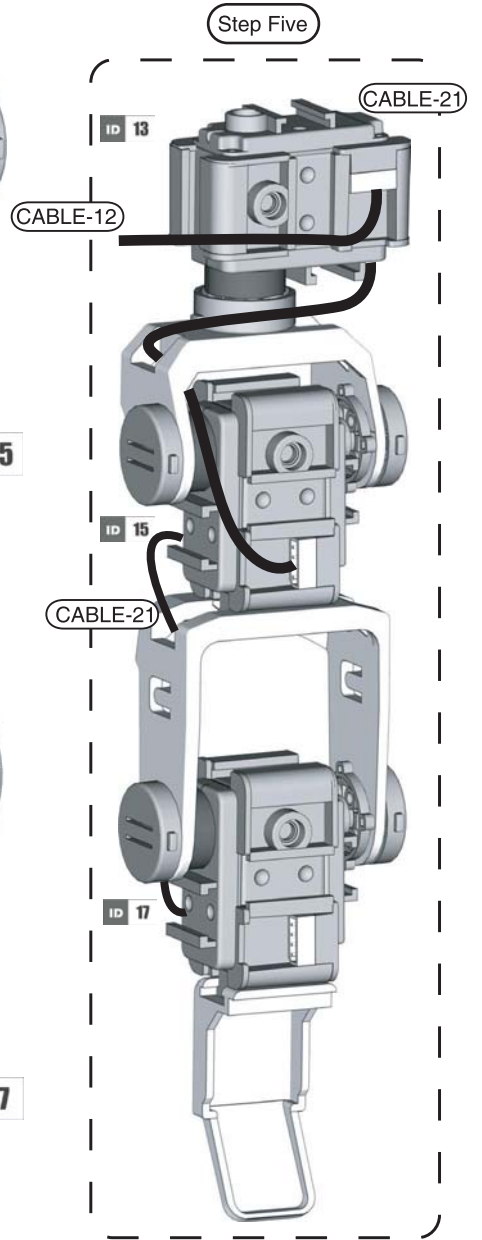
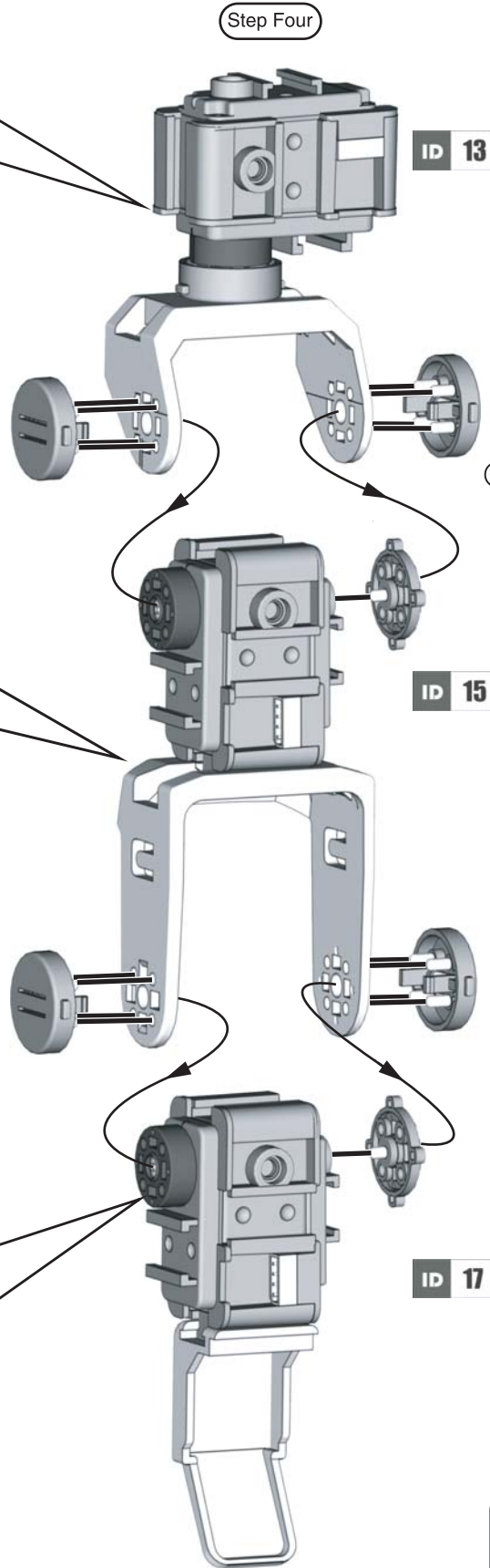
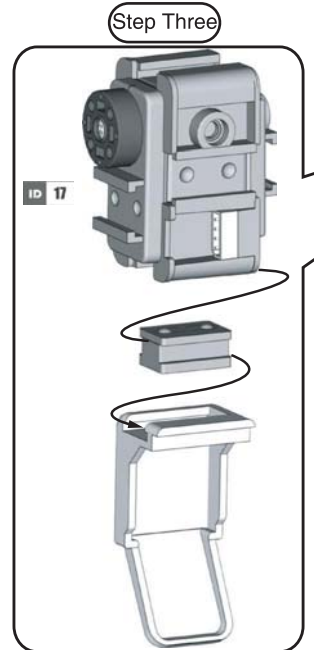
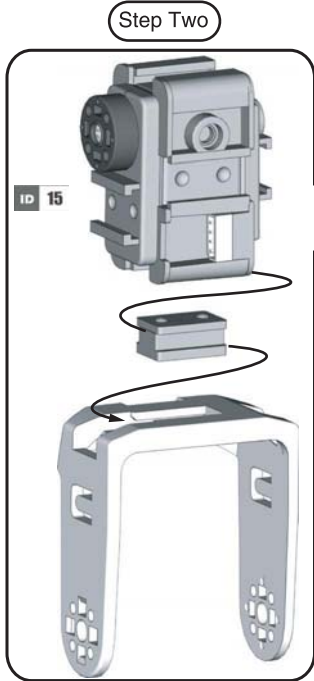
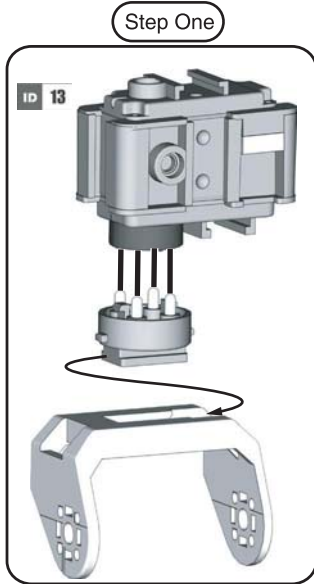


# Use controller to adjust to the zero position. 2.1 Before Building.

## Part One: Right Arm Building

### Components

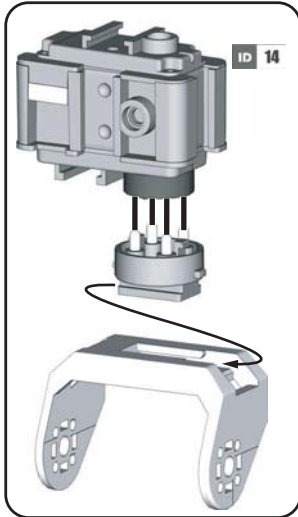
No.	Name	Quantity
1	Intelligent motor	3 (ID13/15/17)
2	T1	1
3	F3	1
4	F2	1
5	T2	4
6	T3	2
7	LH	1
8	S1	2
10	CABLE-21	2
11	CABLE-12	1



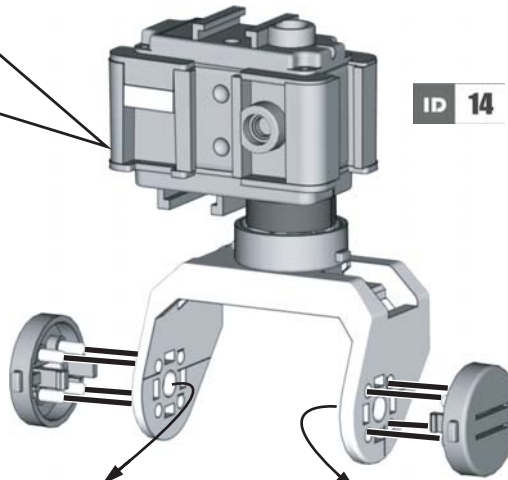
**IMPORTANT**  
Before assembly, ensure all motors are in the zero position.  
(See 2.1 Before building)

## Part Two: Left Arm Building

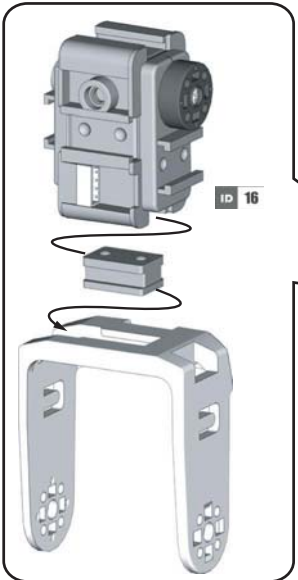
Step One



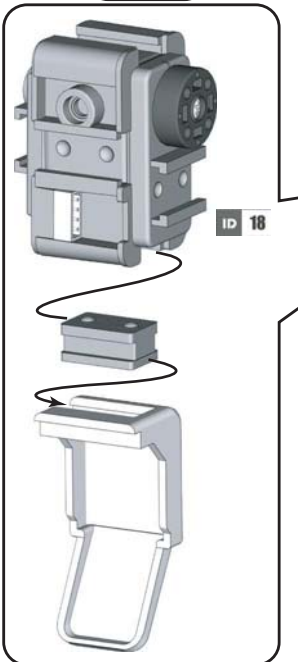
Step Four



Step Two



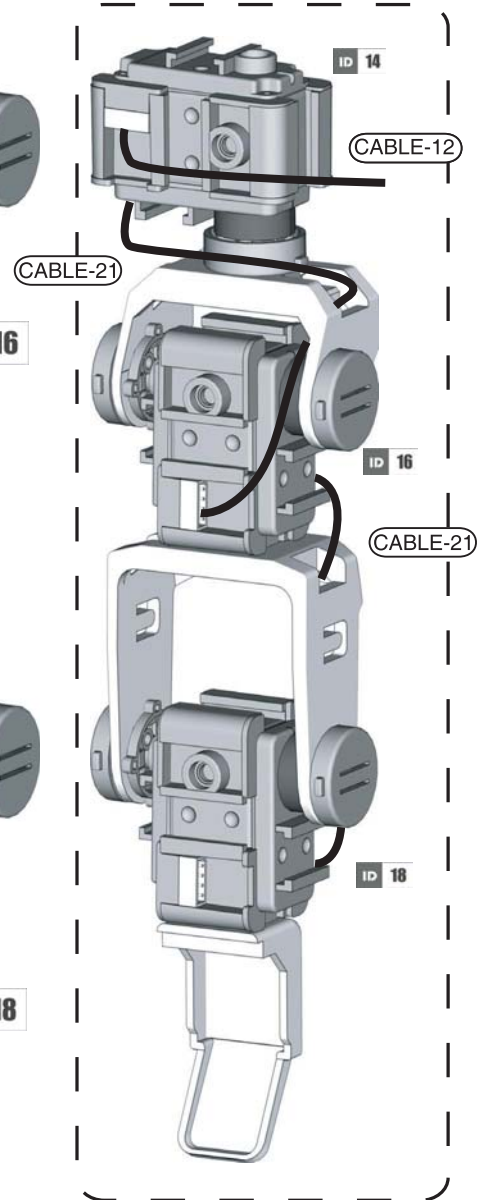
Step Three



Components

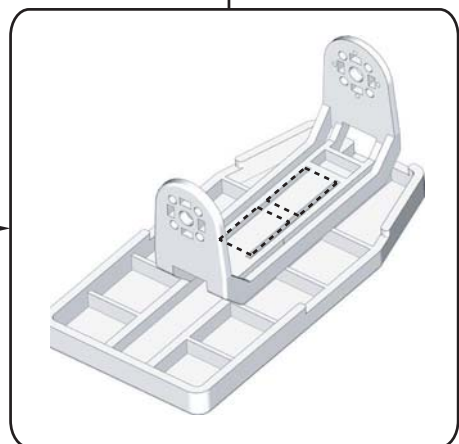
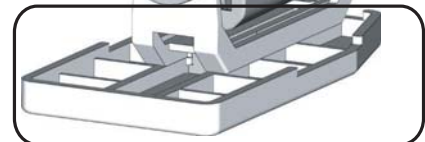
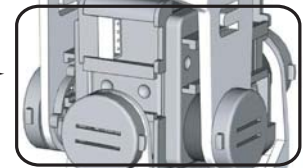
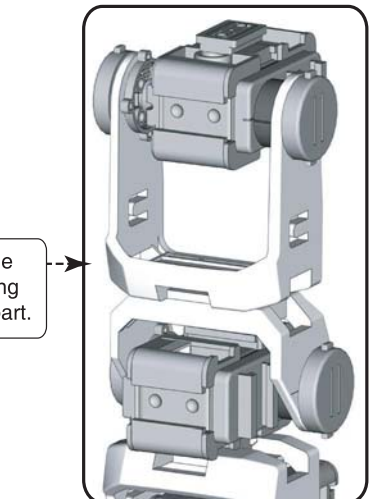
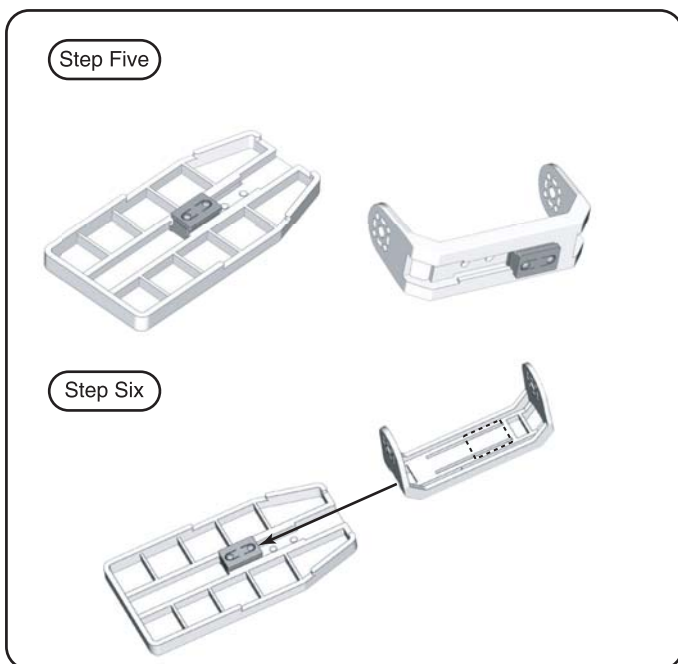
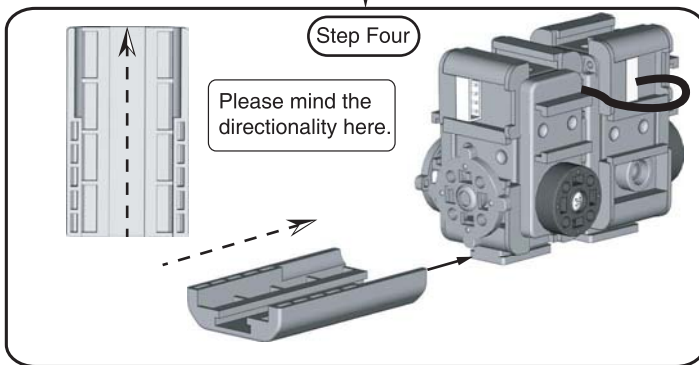
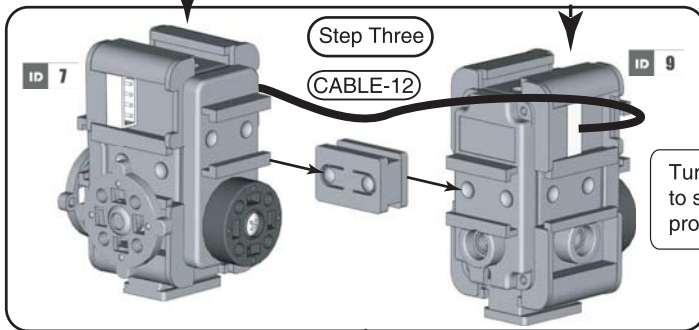
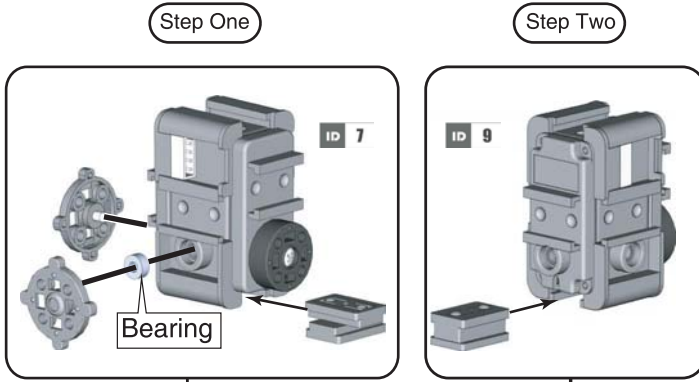
No.	Name	Quantity
1	Intelligent motor	3(ID 14/16/18)
2	T1	1
3	F3	1
4	F2	1
5	T2	4
6	T3	2
7	LH	1
8	S1	2
10	CABLE-21	2
11	CABLE-12	1

Step Five



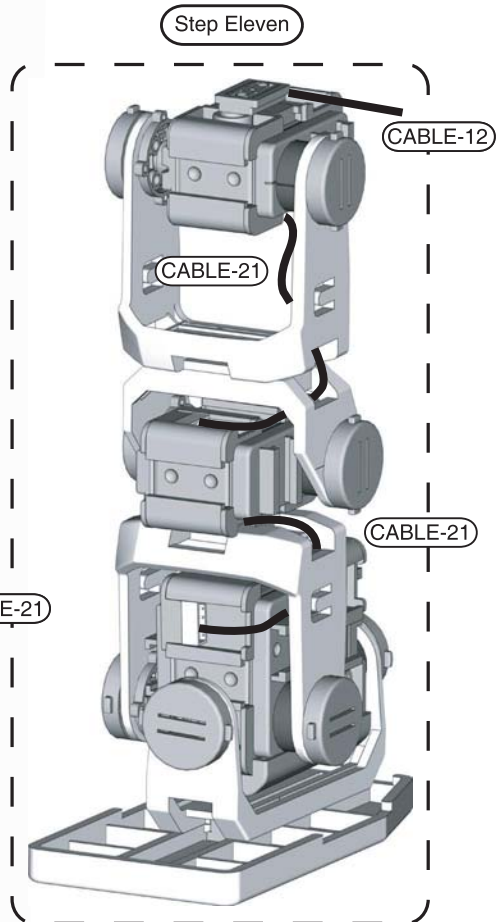
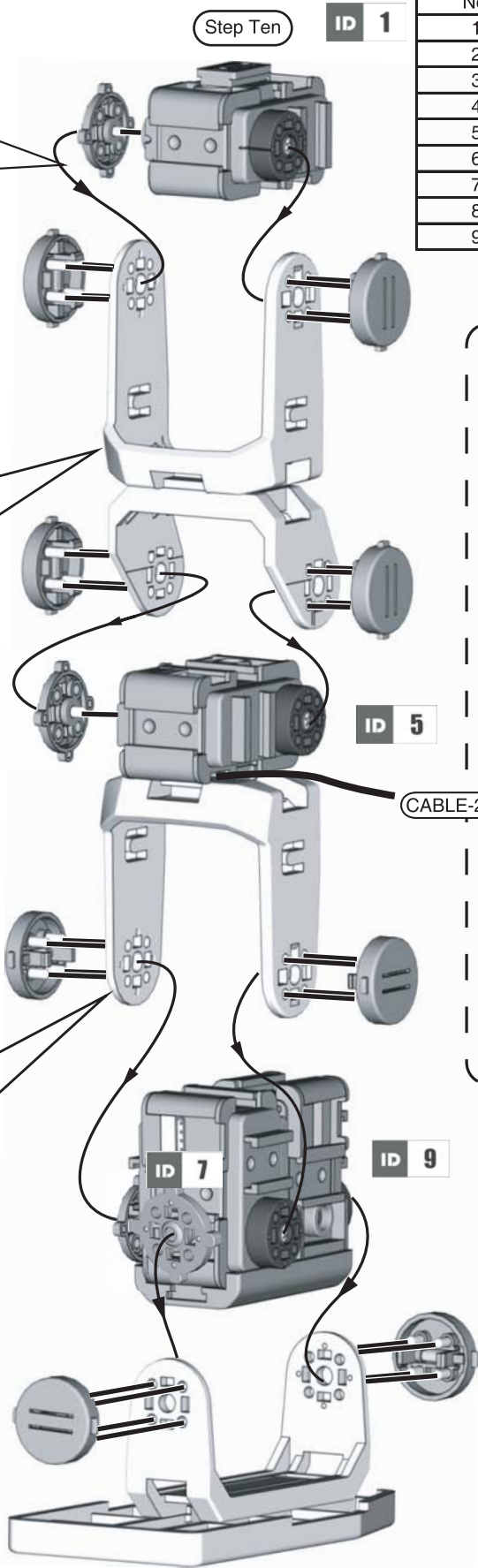
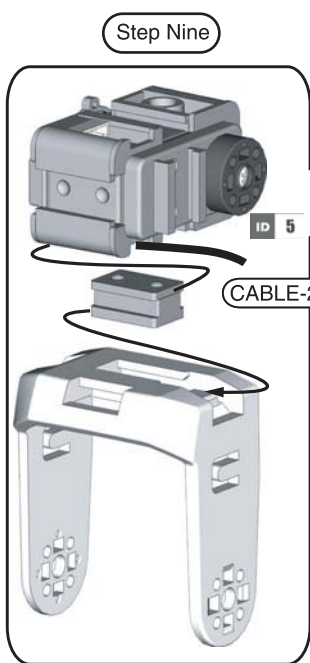
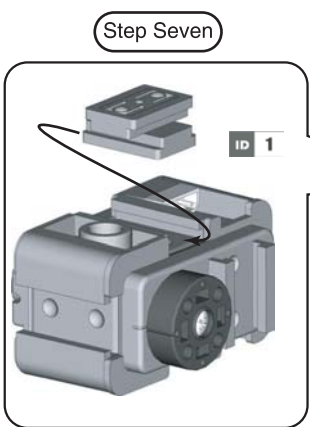
Components

No.	Name	Quantity
1	Intelligent motor	2(ID 7/9)
2	F4	1
3	T3	2
4	P6	1
5	S1	4
6	S2	1
7	S5	1
8	CABLE-12	1



Components

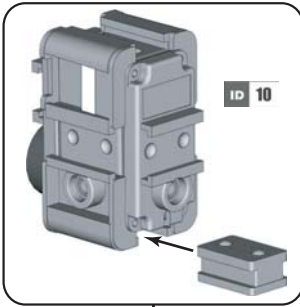
No.	Name	Quantity
1	Intelligent motor	2(ID 1/5)
2	T2	8
3	T3	2
4	F2	2
5	F3	1
6	S1	2
7	S2	1
8	CABLE-21	2
9	CABLE-12	1



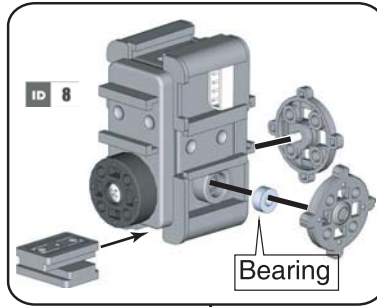
Components

No.	Name	Quantity
1	Intelligent motor	2(ID 8/10)
2	F4	1
3	T3	2
4	P6	1
5	S1	4
6	S2	1
7	S5	1
8	CABLE-12	1

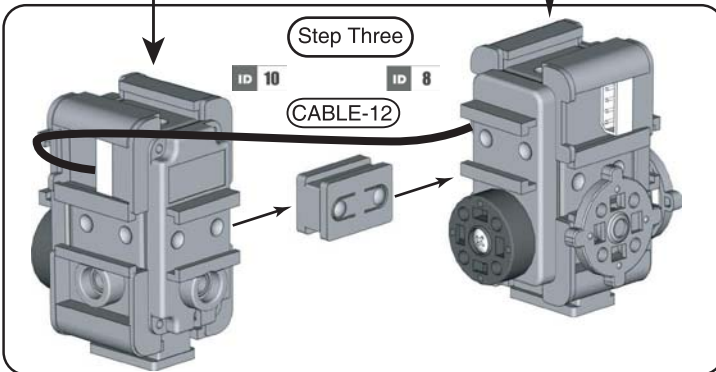
Step One



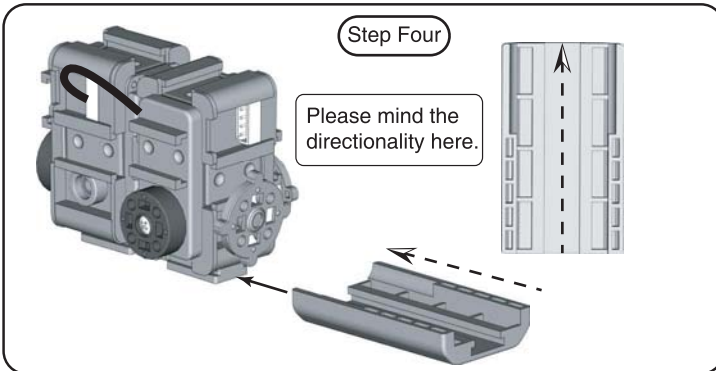
Step Two



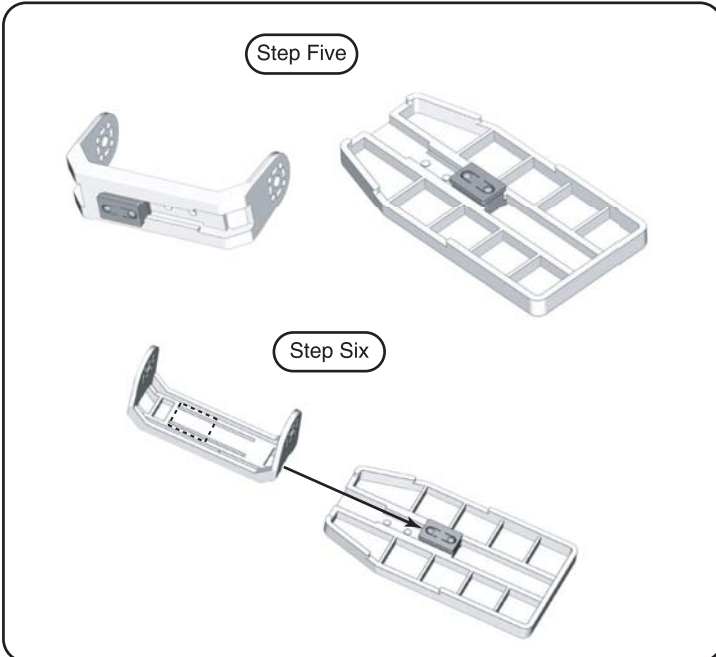
Step Three



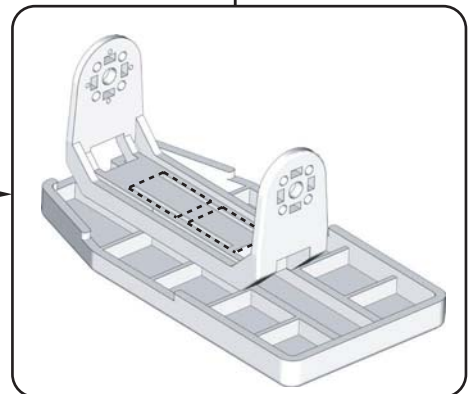
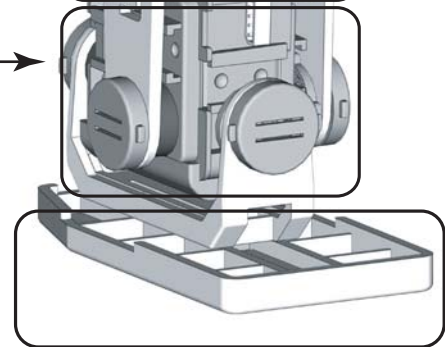
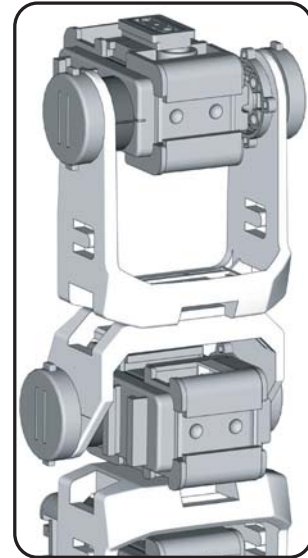
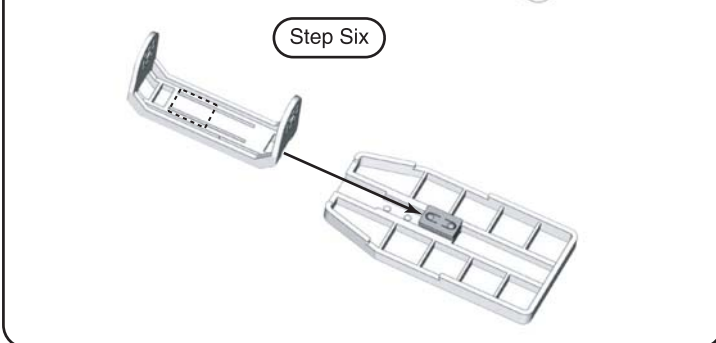
Step Four



Step Five



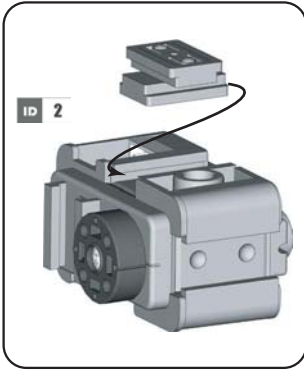
Step Six



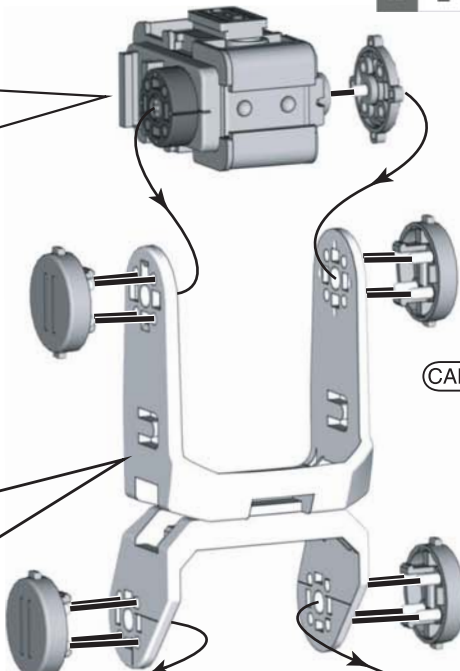
Components

No.	Name	Quantity
1	Intelligent motor	2(ID 2/6)
2	F4	1
3	T3	2
4	P6	1
5	S1	4
6	S2	1
7	S5	1
8	CABLE-12	1

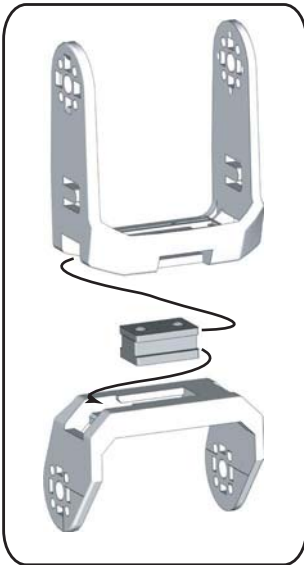
Step Seven



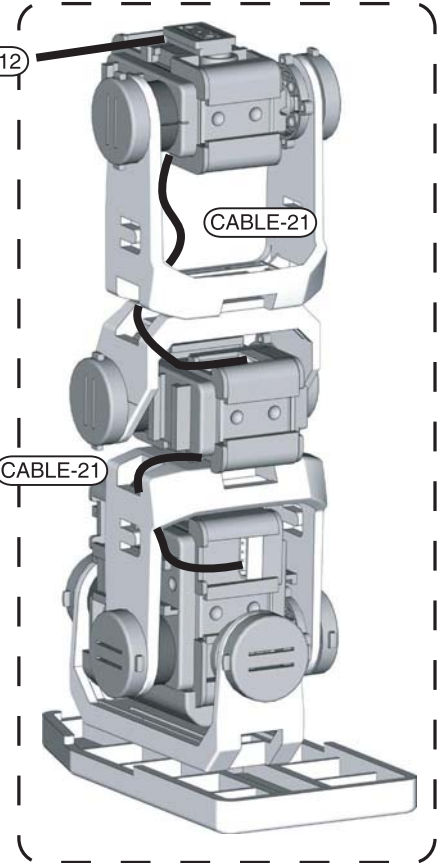
Step Ten



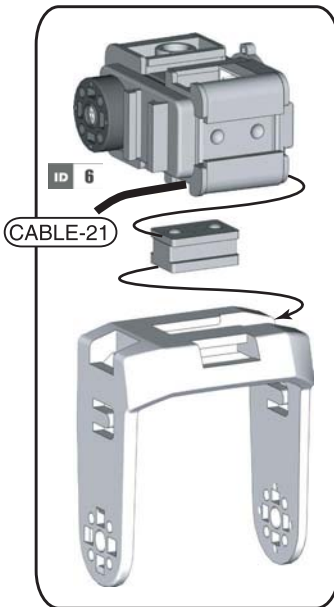
Step Eight



Step Eleven



Step Nine



CABLE-21

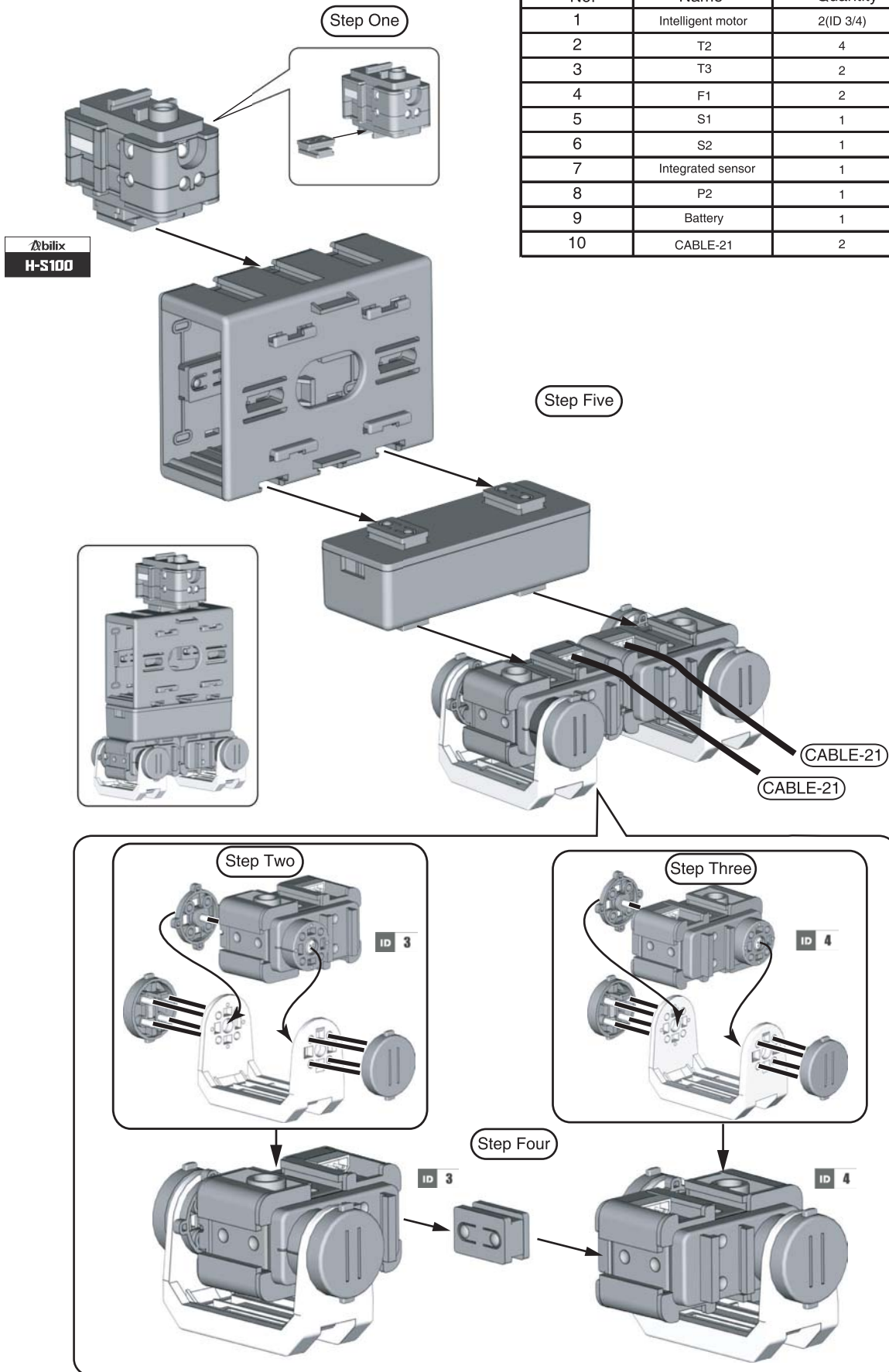
ID 6

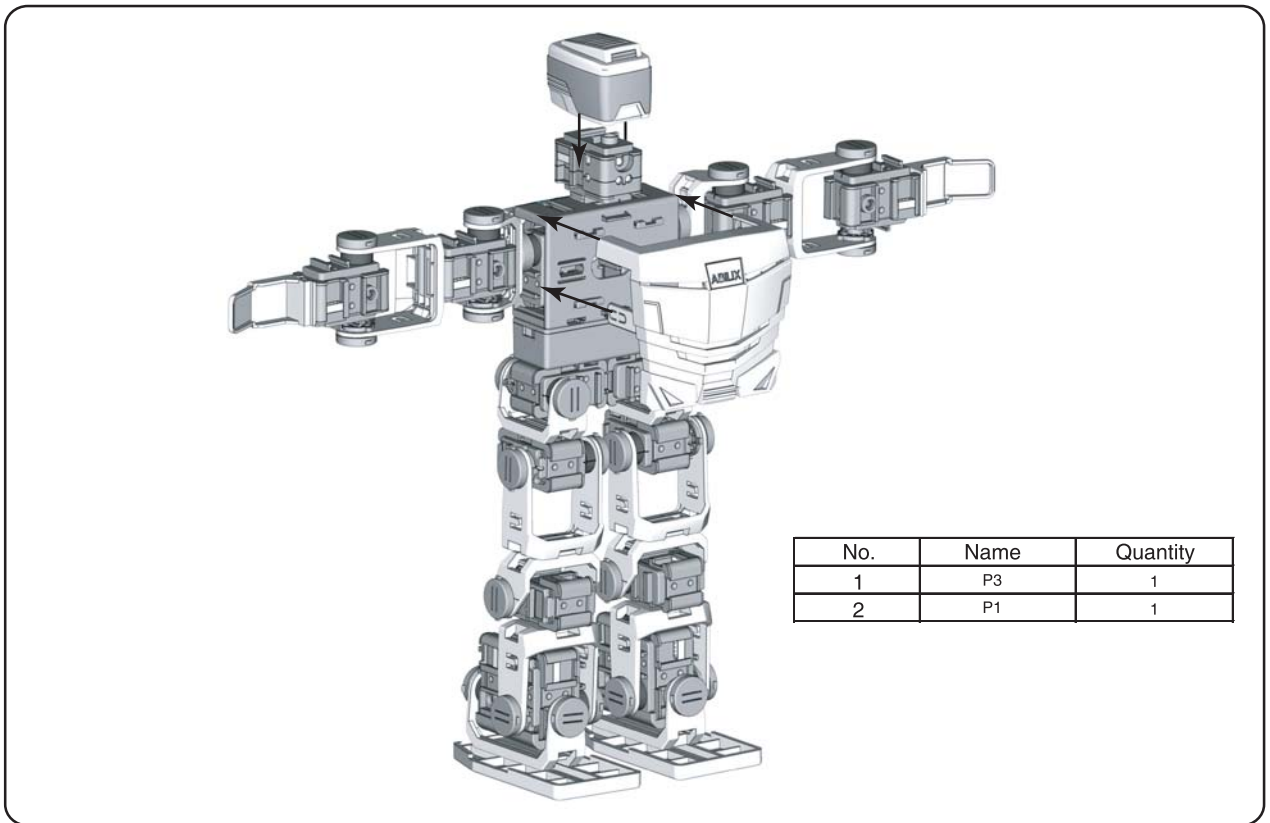
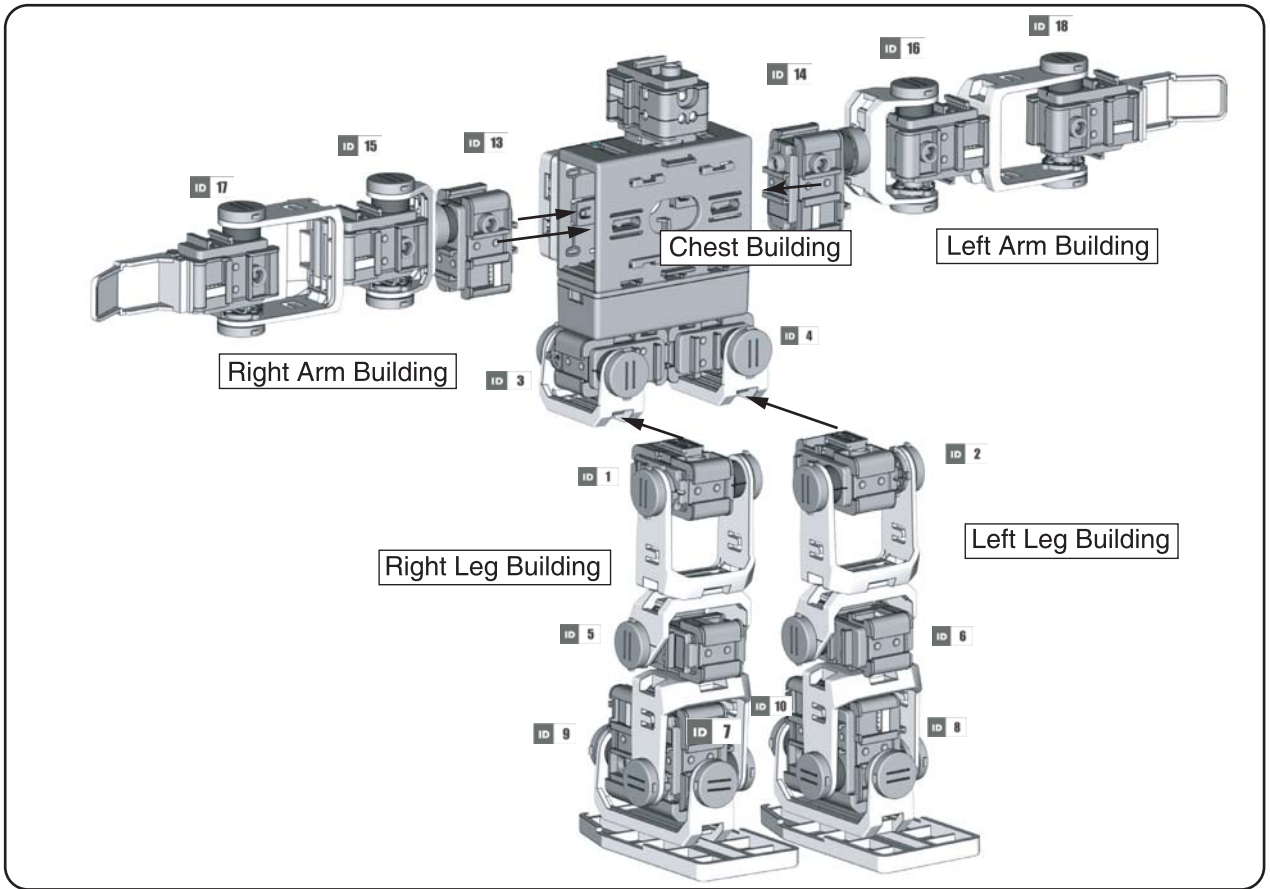
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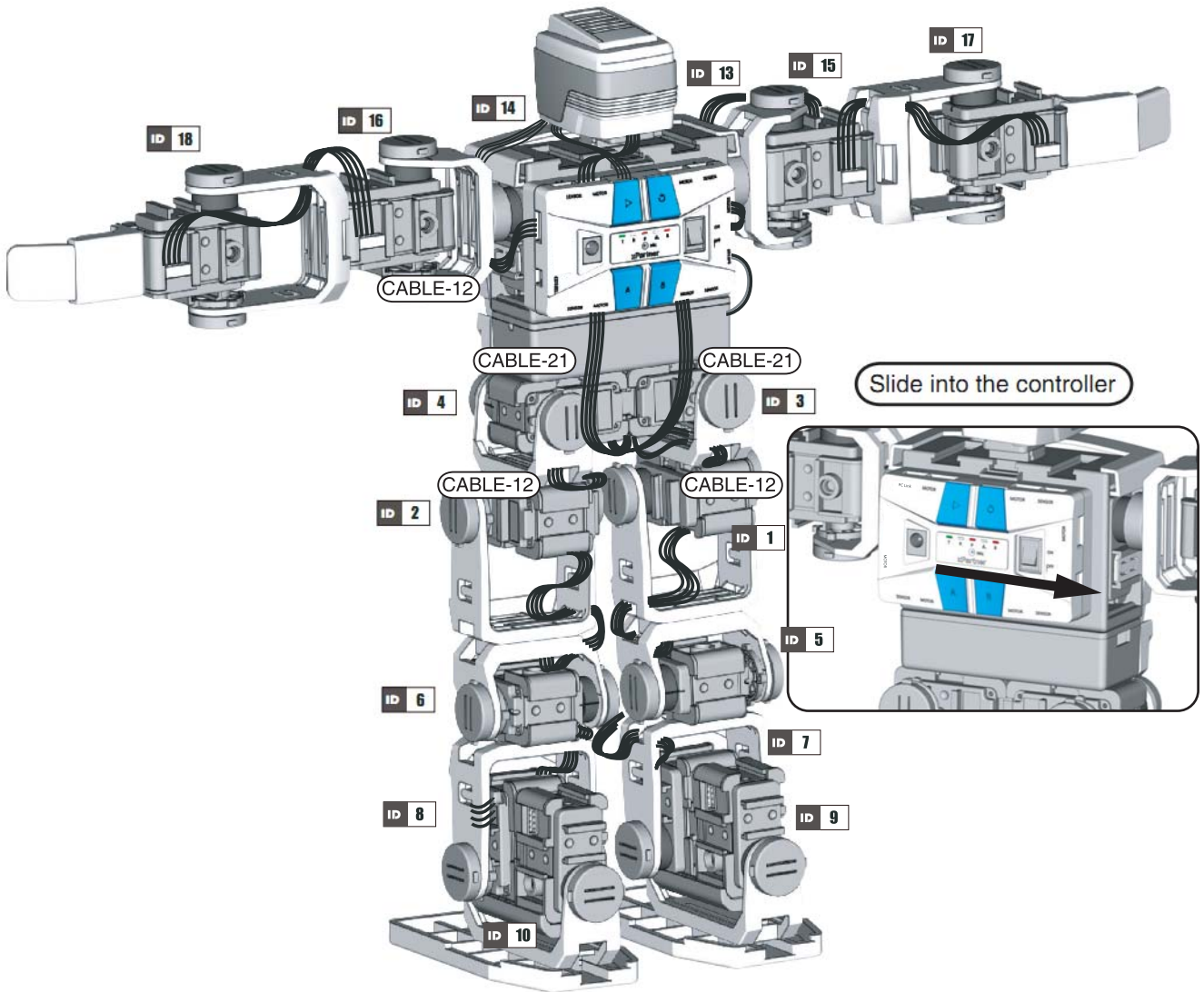
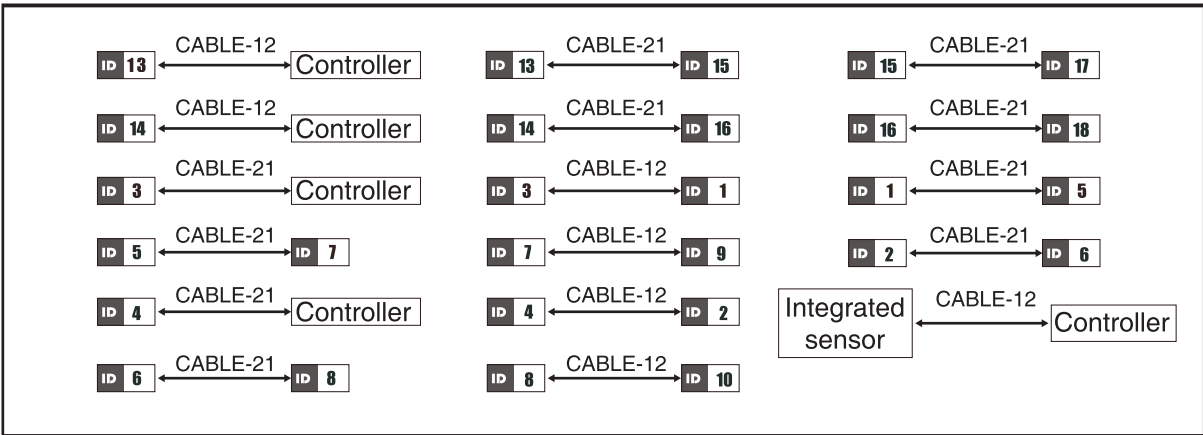
ID 8

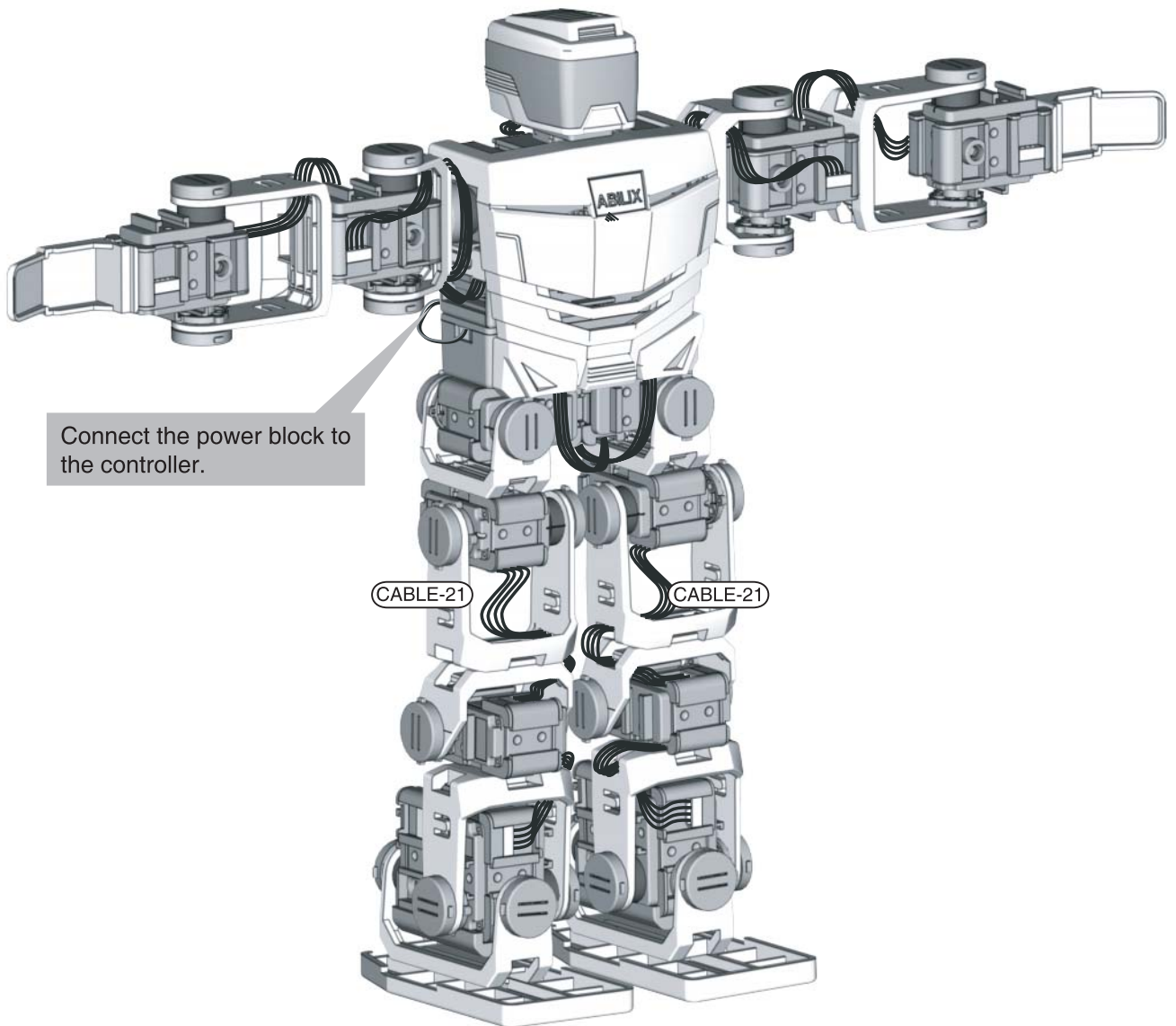
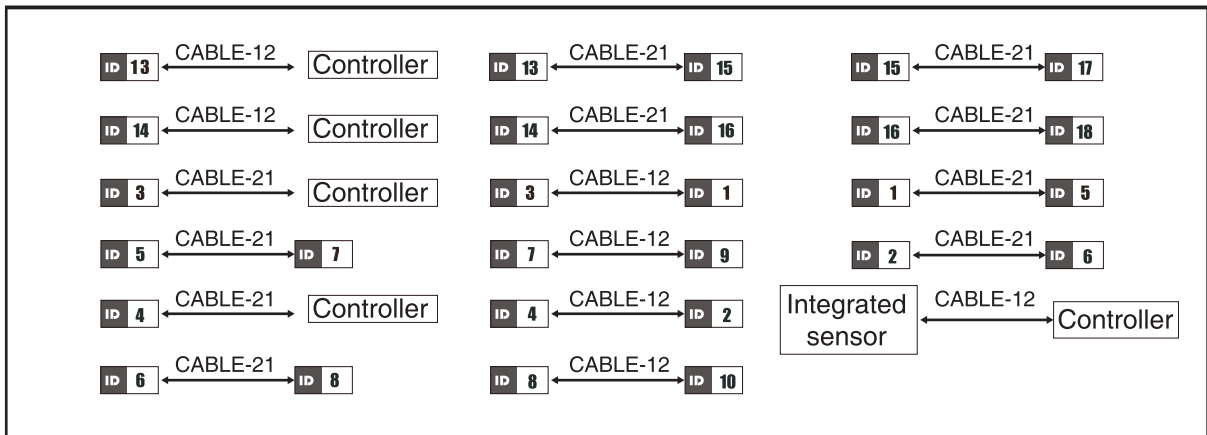
Components

No.	Name	Quantity
1	Intelligent motor	2(ID 3/4)
2	T2	4
3	T3	2
4	F1	2
5	S1	1
6	S2	1
7	Integrated sensor	1
8	P2	1
9	Battery	1
10	CABLE-21	2



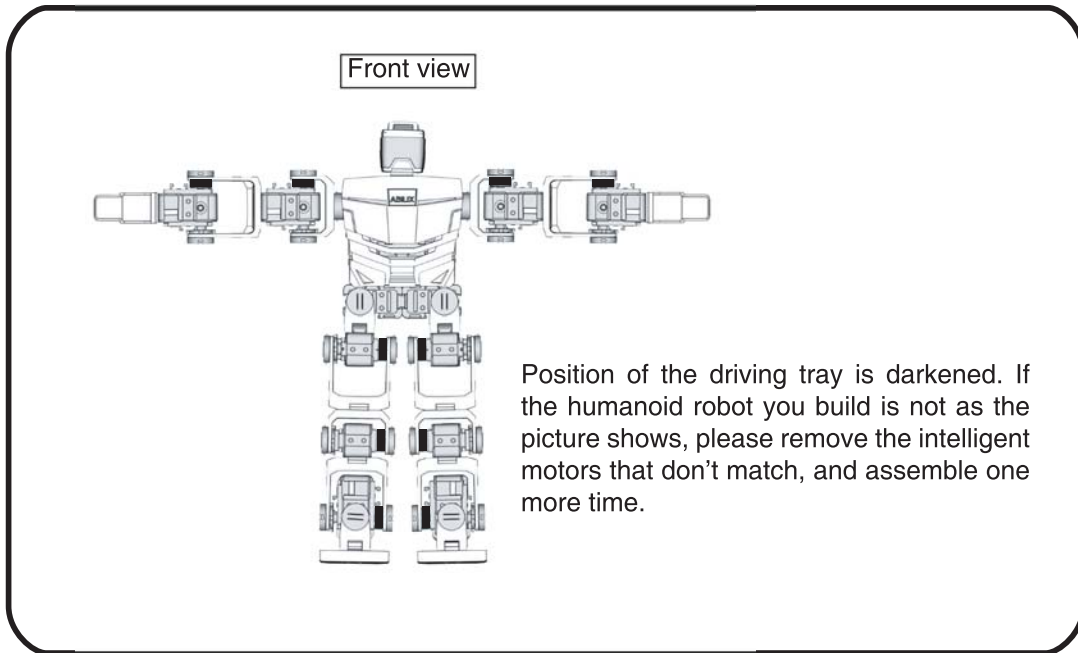






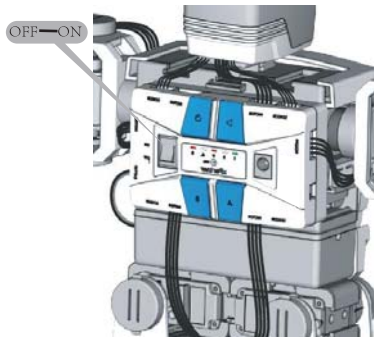
## 2-3 Check after Building

- 1 Check the position of the driving tray on intelligent motor



- 2 Check if the driving tray is at the zero position. Are all intelligent motors connected?

- [1] Turn on the controller.

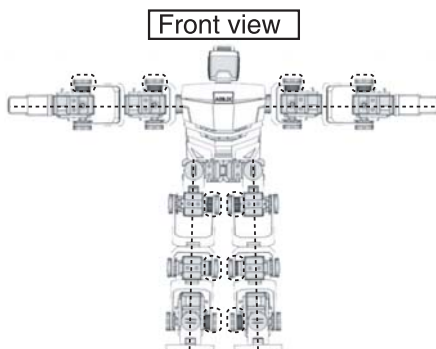


- [3] Check if the motors are connected to the controller.



Press both A and B button for a while. LED on the motors that are connected will stay on, otherwise, it means they are not connected to the controller. Please check the connecting cable.

- [2] Check if the driving tray is at the zero position for all motors..

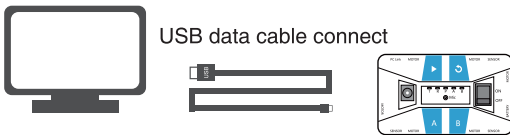


Put the robot as the picture shows. Press both A and B button for a while. If the robot position doesn't change, then the building process is correct. If the robot changes violently, and some of the joints are stuck (LED at the back of the motor is flickering), shut down the controller immediately. Put the robot as the picture shows, and remove the clasp trays highlighted by black marks. Turn on the controller again, press both A and B button for a while, wait until all intelligent motors stop rotating, then put the clasp tray back on.

### III Control the Humanoid Robot

#### 3-1 Download & Run the Demo Program

1. Use USB data cable to connect the computer with the controller.



2. Turn on the controller.



3. Double click the operating software on the desktop.



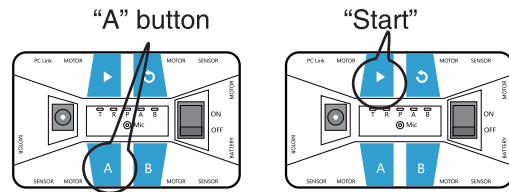
4. Select "Humanoid Robot".



5. Click the circled icon to download program to A.



6. Press "A" button first, then "Start" button to run program A.



#### 3-2 Remote Control the Humanoid Robot

Press the power button on the remote control for 2s, the LED on it will be lit up and start to flicker. Wait 2-5s to let the remote control connect to the controller. When the LED stop flickering and start to emit normally, start the remote control.




Power switch


Button	Function	Button	Function
U	Move Forward	3+D	Bravo
L	Turn Left	3+L	Push up
R	Turn Right	3+R	Backflip
D	Move backward	4+U	Crawl
1+L	Left Foot Kick	4+D	Dance
1+R	Right Foot Kick	4+L	Salute
1+D	Soccer Defense	5+L	Stride Leftward
2+L	Left Punch	5+R	Stride Rightward
2+R	Right Punch	5+6+L	Fast Leftward
2+D	Attack Defense	5+6+R	Fast Rightward
3+U	Bow	5+6+U	Stand Up

## IV Examples of Bionic Robots


### (1) Barrier bar

Model picture	Name	Instructions
	Level	Primary
	Control	Use the buttons on H-CON101 to control the intelligent motor.
	Operation	Press "A" to lift the bar. Press "B" to drop the bar.
	VJC	Function, infinite loop, keys testing, motor mode setting, speed, angle.
	Building	See "manual" in disc.
	Demo program	"B01 Barrier bar" model program.


### (2) Windmill

Model picture	Name	Instructions
	Level	Primary
	Control	Use the buttons on H-CON101 to rotate the wheel
	Operation	Press "A" to rotate the windmill clockwise. Press "B" to rotate the windmill counter-clockwise
	VJC	Function, infinite loop, keys testing, motor mode setting, speed,
	Building	See "manual" in disc.
	Demo program	"B02 Windmill" model program.


### (3) Sound-intensity Measuring Device

Model picture	Name	Instructions
	Level	Primary
	Control	Use the Mic on H-CON101 to control the intelligent motor
	Operation	When the sound that detected by the Mic reaches a certain intensity, the bar connected to the motor will swing toward somewhere and then swing back.
	VJC	Function, infinite loop, sound detection, motor mode setting, speed, position
	Building	See "manual" in disc.
	Demo program	"B03 Sound-intensity measuring device" model program.


### (4) Car Park Barrier

Model picture	Name	Instructions
	Level	Primary
	Control	Use the buttons on H-CON101 to control the intelligent motor
	Operation	Press A to swing the bar horizontally. Press "B" to swing the bar vertically
	VJC	Function, infinite loop, sound detection, motor mode setting, speed, position
	Building	See "manual" in disc.
	Demo program	"B04 Car park barrier" model program.


### (5) PTZ

Model picture	Name	Instructions
	Level	Primary
	Control	Use the buttons on H-CON101 to control the intelligent motor.
	Operation	When "Start" button isn't pressed, the PTZ can swing upward and downward. Press "A", the PTZ rotates counter-clockwise. When "Start" is pressed, it swings leftward and rightward. Press "B", it rotates clockwise. Press "A", it rotates counter-clockwise. Press "B", it rotates clockwise.
	VJC	Function, infinite loop, buttons combination, intelligent motor setting, position.
	Building	See "manual" in disc.
	Demo program	"B05 PTZ" model program.


### (6) Caterpillar

Model picture	Name	Instructions
	Level	Primary
	Control	Use H-CON101 controller to execute its motion.
	Operation	After being activated, the caterpillar moves forward. When an object is detected in front, it stops to move backward for a while.
	VJC	Function, infinite loop, distance measuring, action page editing, action page calling.
	Building	See "manual" in disc.
	Demo program	"Caterpillar" Model Program


### (7) Aggressive Duck

Model picture	Name	Instructions
	Level	Primary
	Control	Use the distance measuring module on the integrated sensor to operate the action
	Operation	When obstacle is detected on the left, the attack arm turns left. When obstacle is detected on the right, the attack arm turns right. When obstacle is detected in the middle, the attack arm attacks forward.
	VJC	Function, infinite loop, distance measuring, action editing.
	Building	See "manual" in disc.
	Demo program	"B07 Aggressive Duck" model program.


### (8) Artillery Cannon

Model picture	Name	Instructions
	Level	Primary
	Control	Use H-S100 integrated sensor to make the intelligent motor rotate infinitely and to move the joint.
	Operation	The Artillery Cannon turns left if detecting an object on the left by its integrated sensor; turns right if an object is detected on the right; moves forward if an object is detected in front. It opens fire if claps are detected.
	VJC	Function, infinite loop, distance measuring, set motor, speed.
	Building	See "manual" in disc.
	Demo program	"Artillery Cannon" Model Program


### (9) Tricycle

Model picture	Name	Instructions
	Level	Primary
	Control	Use integrated sensor to make the tricycle move forward, turn left, turn right and move backward.
	Operation	When an object is detected in front, the tricycle moves sideways, make a turn and then move forward.
	VJC	Function, infinite loop, distance measuring, set motor, speed.
	Building	See "manual" in disc.
	Demo program	"Tricycle" Model Program


### (10) Intelligent 4WD

Model picture	Name	Instructions
	Level	Primary
	Control	Use integrated sensor to control the car to detect cliff and avoid obstacles.
	Operation	When a cliff is detected on the right , the car draws back and turn left.
	VJC	Function, infinite loop, distance measuring, motor mode setting, speed.
	Building	See "manual" in disc.
	Demo program	"B10 Intelligent 4WD" model program


### (11) Clapping Penguin

Model picture	Name	Instructions
	Level	Primary
	Control	Use clap detecting sensor on the integrated sensor to operate the action.
	Operation	Times the penguin claps are based on how many claps the integrated sensor detects.
	VJC	Function, infinite loop, clap detecting, action editing
	Building	See "manual" in disc.
	Demo program	"B11 Clapping Penguin" model program.


### (12) Mobile Penguin

Model picture	Name	Instructions
	Level	Primary
	Control	Use the distance-measuring module in the integrated sensor to make the motor rotate infinitely and to move the joint.
	Operation	The penguin lifts its left arm if the left distance-measuring module detects an object. The penguin lifts its right arm if the right distance-measuring module detects an object. The penguin moves forward if the central distance-measuring module detects an object.
	VJC	Function, infinite loop, distance measuring, action page editing, calling.
	Building	See "manual" in software.
	Demo program	"Mobile Penguin" Model Program


### (13) Crab Claw

Model picture	Name	Instructions
	Level	Primary
	Control	Use distance measuring sensor on the integrated sensor to make the claw open or shut.
	Operation	When an obstacle is detected on the left, the claws shut, otherwise the claws open.
	VJC	Function, infinite loop, distance measuring, action editing
	Building	See "manual" in disc.
	Demo program	"B13 Crab Claw" model program.


### (14) Biped Monster

Model picture	Name	Instructions
	Level	Primary
	Control	Use the distance measuring module on the integrated sensor to control the biped monster.
	Operation	When an obstacle is detected on the left, the biped monster turns right. When an obstacle is detected on the right, the biped monster turns left. When an obstacle is detected in the middle, the biped monster draws back and turns left.
	VJC	Function, infinite loop, distance measuring, action editing
	Building	See "manual" in disc.
	Demo program	"B14 Biped Monster" model program.


### (15) Penguins of Madagascar

Model picture	Name	Instructions
	Level	Medium
	Control	Use distance-measuring module in the integrated sensor to imitate real penguin's motion.
	Operation	After the program is being activated, the penguin moves forward. When an obstacle is detected in front, it moves back and turns left. While the penguin is in the process of execution, if it detects claps, it does demonstrative actions.
	VJC	Function, infinite loop, distance measuring, action page editing, calling.
	Building	See "manual" in disc.
	Demo program	"Penguins of Madagascar" Model Program


### (16) Explorer

Model picture	Name	Instructions
	Level	Medium
	Control	Use the Mic on H-CON101 to control the intelligent motor
	Operation	When an obstacle is detected by Explorer, it'll remove the obstacle and move forward.
	VJC	Function, infinite loop, distance measuring, action editing, intelligent motor separate controlling.
	Building	See "manual" in disc.
	Demo program	"C02 Explorer" model program.


### (17) Multiplex Car

Model picture	Name	Instructions
	Level	Medium
	Control	Use the integrated sensor to change into moving by feet or by car wheels.
	Operation	When no obstacles are detected in front, the robot moves by feet. When obstacles are detected in front, the robot changes from moving by feet to wheels and move away quickly.
	VJC	Function, infinite loop,distance measuring, action editing, intelligent motor separate
	Building	See "mannual" in disc.
	Demo program	"C03 Multiplex Car" model program.


### (18) Turtle

Model picture	Name	Instructions
	Level	Medium
	Control	Use the integrated sensor to imitate the movement of a turtle.
	Operation	Operating the program, the turtle starts to crawl slowly. When danger detected, it stops moving to pretend fake death. Then it draws back and turns left, moving forward.
	VJC	Function, infinite loop,distance measuring,action editing
	Building	See "mannual" in disc.
	Demo program	"C04 Turtle" model program.


### (19) Mechanical Claw

Model picture	Name	Instructions
	Level	Medium
	Control	To control the claw to pick and place by detecting motor's overload.
	Operation	After the program is activated, press any button, the claw starts to pick up the object and carries it to a certain position. After the object being taken, the claw releases automatically.
	VJC	Function, infinite loop, motor overload, action page editing.
	Building	See "mannual" in disc.
	Demo program	"Mechanical Claw" Model Program


### (20) Deer

Model picture	Name	Instructions
	Level	Medium
	Control	Use the integrated sensor to imitate the movement of a deer.
	Operation	Clap your hand to activate the robot deer. When hand waving is detected in front, the deer move forward quickly. When hand waving is no longer detected, the deer moves forward slowly and after a while, it returns to sleep mode.
	VJC	Function, infinite loop,distance measuring, sound detecting, system clock, action editing.
	Building	See "mannual" in disc.
	Demo program	"C06 Deer" model program.


## (21) Dwarf

Model picture	Name	Instructions
	Level	Medium
	Control	The dwarf moves forward, move sideways and do demonstrative actions by integrated sensor.
	Operation	After the program is activated, the dwarf moves forward. When a threat is detected, it stops to move backward for several steps and moves sideways for some distance. Then it continue moving forward.
	VJC	Function, infinite loop, obstacle –detecting module, action page editing and calling.
	Building	See “mannual” in disc.
	Demo program	”Dwarf” Model Program


## (22) Long-hand monster

Model picture	Name	Instructions
	Level	Medium
	Control	Use buttons on the controller to control its position
	Operation	Start the program, long-hand monster moves forward quickly. When it falls down backward, press A or B to make it stand back up and go on moving forward.
	VJC	Function, infinite loop, sound detecting, motor mode setting, position
	Building	See “mannual” in disc.
	Demo program	“C08 Long-hand monster” model program.


## (23) Excavator

Model picture	Name	Instructions
	Level	Medium
	Control	Use the distance measuring module on the integrated sensor to make the excavator turn left/right, excavate, etc.
	Operation	When an obstacle is detected on the left, it turns left When an obstacle is detected on the right, it turns right When an obstacle is detected in the middle, it starts to excavate.
	VJC	Function, infinite loop, distance measuring, wheel moving, action editing.
	Building	See “mannual” in disc.
	Demo program	“C09 Excavator” model program.


## (24) Robot Flower

Model picture	Name	Instructions
	Level	Medium
	Control	Use the light detecting module on the integrated sensor to make the flower open or close.
	Operation	Start the program, the robot flower is closed at first. When light is detected on the petal, the robot flower starts to blossom and make a performance.
	VJC	Function, infinite loop, light detecting, action editing.
	Building	See “mannual” in disc.
	Demo program	“C10 Robot Flower” model program.


### (25) Robot Dog

Model picture	Name	Instructions
	Level	Advanced
	Control	Use infrared sensor, sound detection, clock on the integrated sensor to control feet of the dog.
	Operation	Start the program, the robot dog moves based on times user claps. Clap twice. Mode One: The dog moves forward slowly, stops after 4 seconds. When touched on the mouth, it moves forward quickly. Clap three times. Mode Two: The dog wakes up. Clap four times. Mode Three: Robot dog stands upside down.
	VJC	Function, infinite loop, sound detecting, action editing.
	Building	See "manual" in disc.
	Demo program	"A01 Robot Dog" model program.


### (26) Spider King

Model picture	Name	Instructions
	Level	Advanced
	Control	Use infrared sensor, sound detection, clock on the integrated sensor to control feet of the spider.
	Operation	Start the spider king. When obstacle is detected in front, the spider starts to draw back, turn left and move away quickly.
	VJC	Function, infinite loop, infrared sensor, sound detecting, action editing.
	Building	See "manual" in disc.
	Demo program	"A02 Spider King" model program.



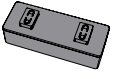




### (27) Dinosaur



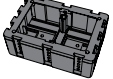
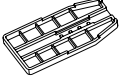
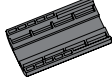


Model picture	Name	Instructions
	Level	Advanced
	Control	Use infrared sensor, sound detection on the integrated sensor to control its attack action.
	Operation	The dinosaur starts from walking. When a threat is detected, it makes attack action.
	VJC	Function, infinite loop, infrared sensor, sound detecting, action editing.
	Building	See "manual" in disc.
	Demo program	"A03 Dinosaur" model program.








### (28) Scorpion





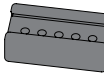


Model picture	Name	Instructions
	Level	Advanced
	Control	Use infrared sensor, sound detection, clock on the integrated sensor to control its feet.
	Operation	The scorpion is at sleep mode when started. Clap your hands to wake it up. If you put your hands close to it head, it'll attack with its tail.
	VJC	Infinite loop, sound detecting, action editing, clock.
	Building	See "manual" in disc.
	Demo program	"A04 Scorpion" model program.





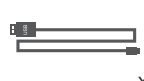

# V、Part List

H-CON101  x1	RC  x1	BATTERY  x1	H-S100  x1	H-M24  x18	P1  x1	P2  x1
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P3  x1	P4  x1	P5  x1	P6  x2	S5  x2	F1  x12	F2  x6
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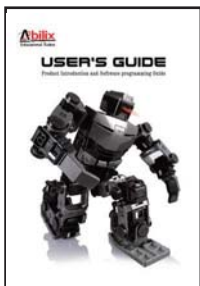
F3  x12	F4  x6	T1  x5	T2  x38	T3  x18	LH  x11	SH  x6
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S3  x7	S4  x7	S1  x24	S2  x14	S6  x10	Tire  x6	Wheel  x6
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Bearing  x2	SMPS  x1	CHARGE  x1	CONNECT-CABLE  x1	USB-CABLE  x1	DISC  x1
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 CABLE-12 x14

 CABLE-21 x10



USER'S GUIDE x1



QUICK START x1