

# DARwin OP

# Wiring Manual

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# DARwIn OP Wiring Manual

Created by RoMeLa at Virginia Tech

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**THIS WIRING MANUAL IS TO BE USED IN  
CONJUNCTION WITH THE FOLLOWING DOCUMENTS:**

DARwIn OP Assembly Manual  
DARwIn OP Fabrication Manual



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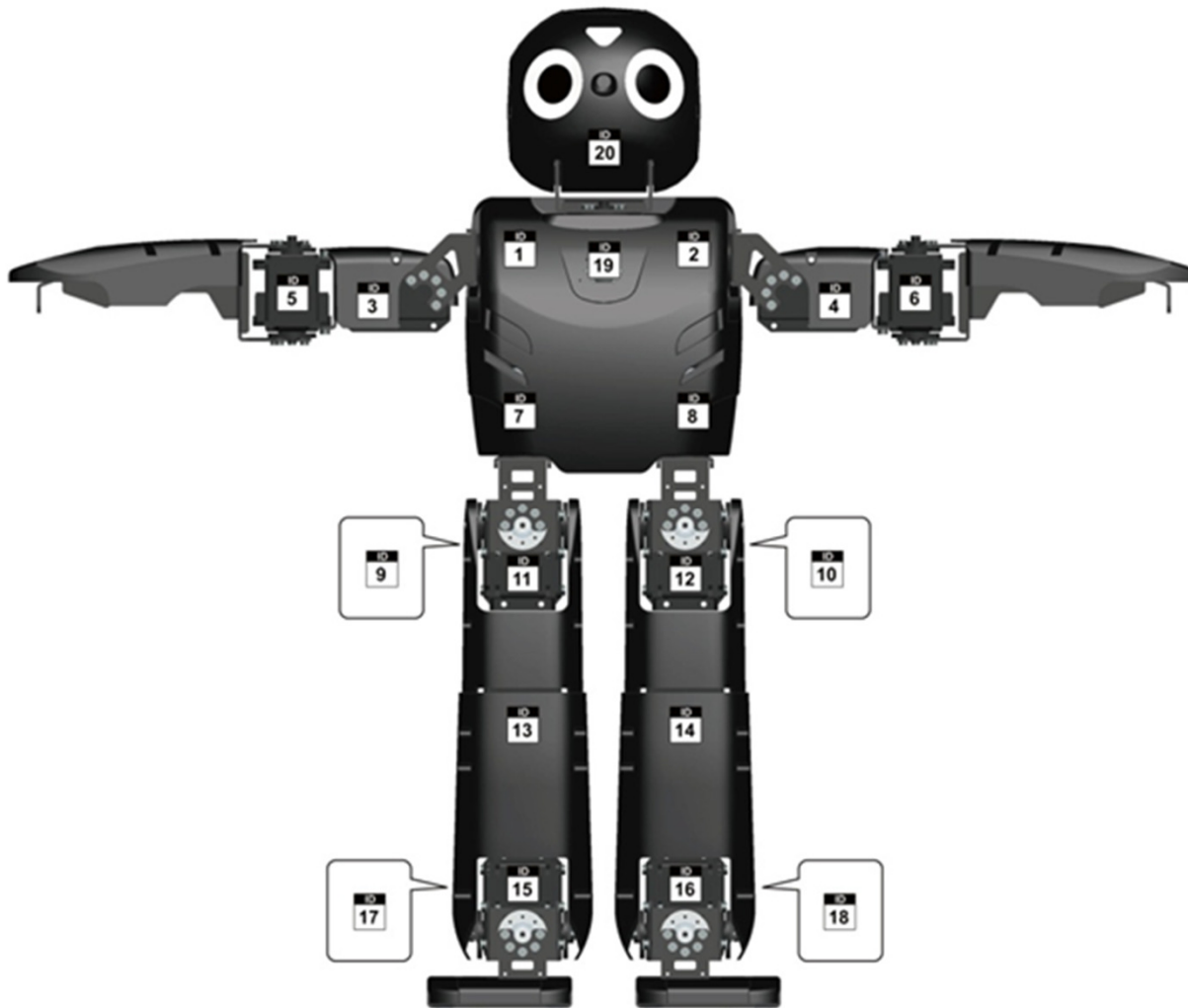
# DARwIn OP Wiring Manual

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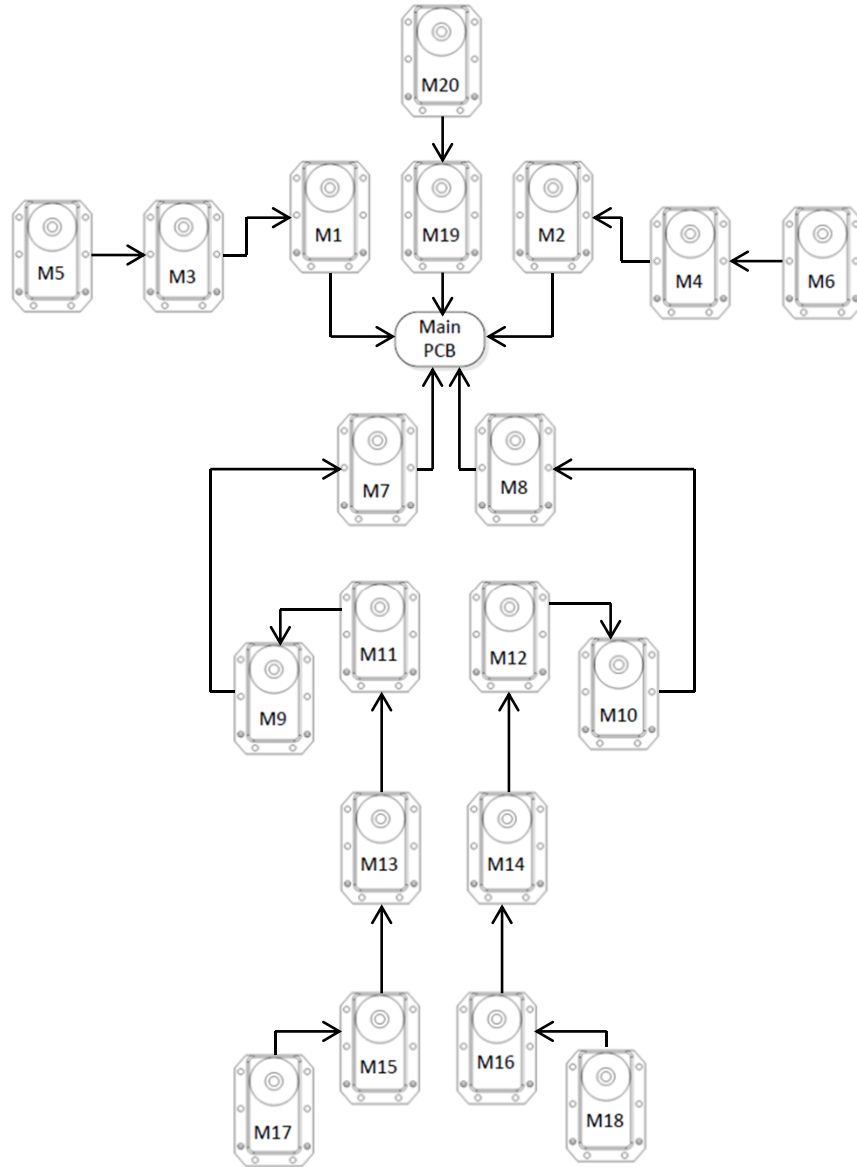
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# 1. Motor Arrangements



Actuator ID	Actuator Type
M1	Dynamixel RX-28M
M2	Dynamixel RX-28M
M3	Dynamixel RX-28M
M4	Dynamixel RX-28M
M5	Dynamixel RX-28M
M6	Dynamixel RX-28M
M7	Dynamixel RX-28M
M8	Dynamixel RX-28M
M9	Dynamixel RX-28M
M10	Dynamixel RX-28M
M11	Dynamixel RX-28M
M12	Dynamixel RX-28M
M13	Dynamixel RX-28M
M14	Dynamixel RX-28M
M15	Dynamixel RX-28M
M16	Dynamixel RX-28M
M17	Dynamixel RX-28M
M18	Dynamixel RX-28M
M19	Dynamixel RX-28M
M20	Dynamixel RX-28M

# 2. Motor Connections



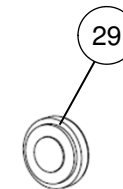
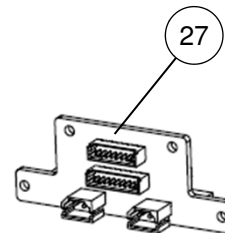
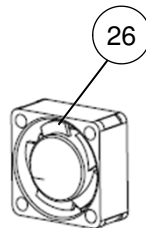
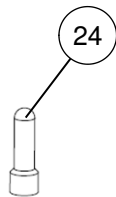
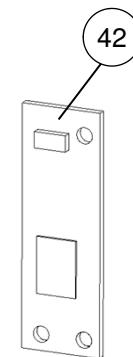
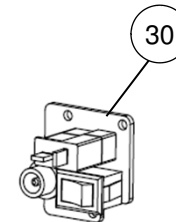
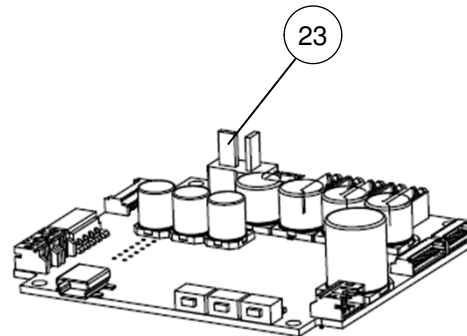
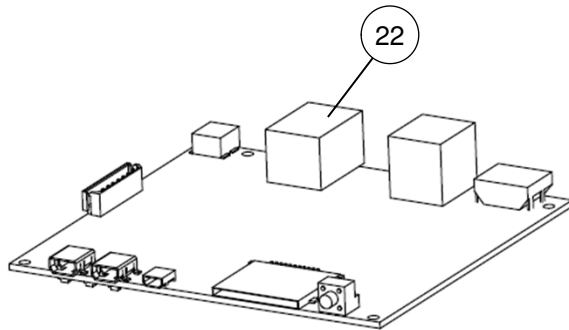
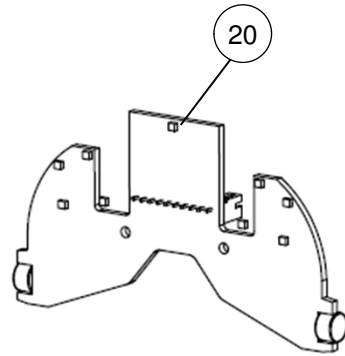
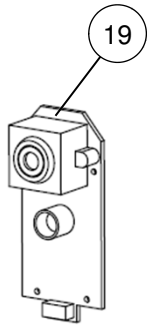
Wire No.	From	To	Approximate Length (cm)
WM1	M20	M19	19
WM2	M19	Main PCB	8
WM3	M1	Main PCB	10
WM4	M2	Main PCB	10
WM5	M7	Main PCB	23
WM6	M8	Main PCB	17
WM7	M5	M3	5
WM8	M3	M1	18
WM9	M6	M4	5
WM10	M4	M2	18
WM11	M9	M7	13
WM12	M10	M8	13
WM13	M11	M9	6
WM14	M12	M10	6
WM15	M13	M11	18
WM16	M14	M12	18
WM17	M15	M13	25
WM18	M16	M14	25
WM19	M17	M15	6
WM20	M18	M16	6



WM

# 3-1. Parts List 1 - Electronics

Part Number	Description	Qty.
19	Camera	1
20	Head PCB	1
22	Module Controller PCB	1
23	Main PCB	1
24	Antenna	1
25	Antenna Connector	1
26	Fan	2
27	Back Cover PCB	1
29	Speaker	1
30	Power Switch	1
31	Battery	1
42	Antenna PCB	1

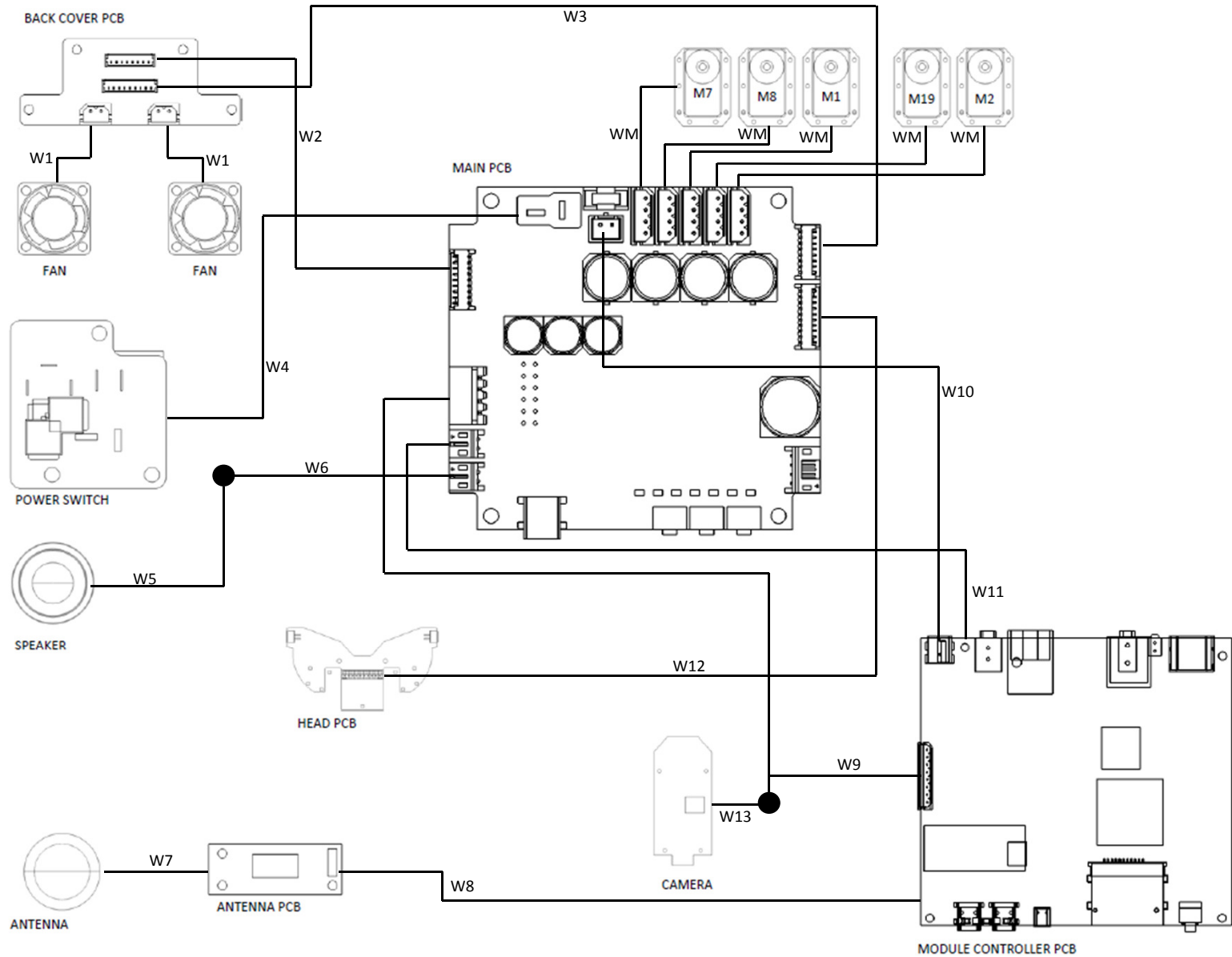


## 3-2. Parts List 2 - Wires

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Wire No.	Wire Name	Approximate Length (cm)
W1	Fan Wire	5
W2	Fan PCB Wire 8-pin	18
W3	Fan PCB Wire 9-pin	18
W4	Power Switch Wire	13
W5	Speaker Wire	13
W6	Speaker Extension Wire	9
W7	Antenna Wire	10
W8	Antenna PCB Wire	5
W9	Module Controller 3-Way Wire	5
W10	Module Controller to Main PCB-Top Wire	11
W11	Module Controller to Main PCB-Bottom Wire	13
W12	Head PCB Wire 10-pin	28
W13	Camera PCB Wire	23

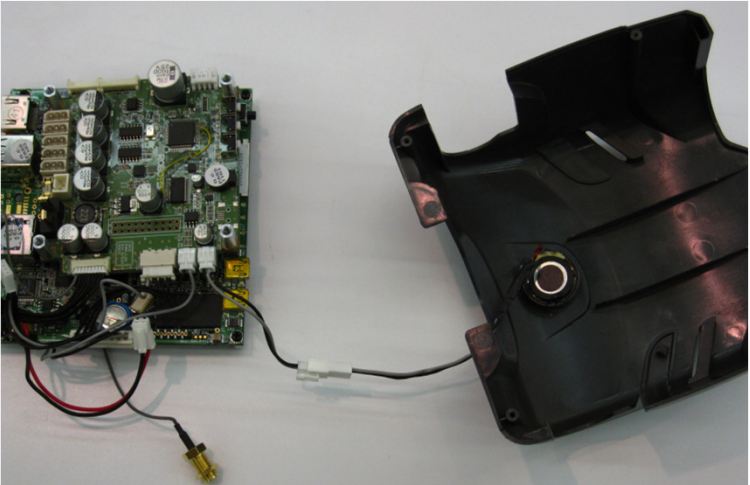
# 4. Overall Chest Wiring Layout



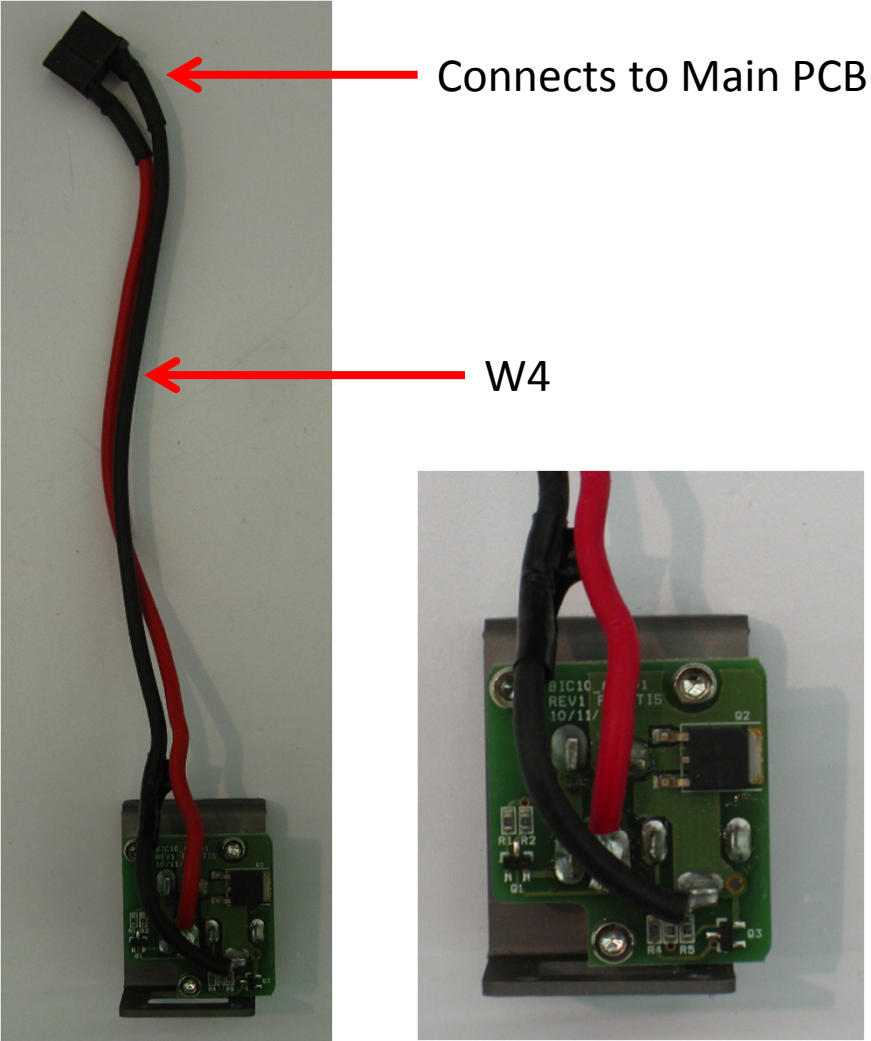


# 5. Chest Section Wiring

## 5-1 Speaker Wiring

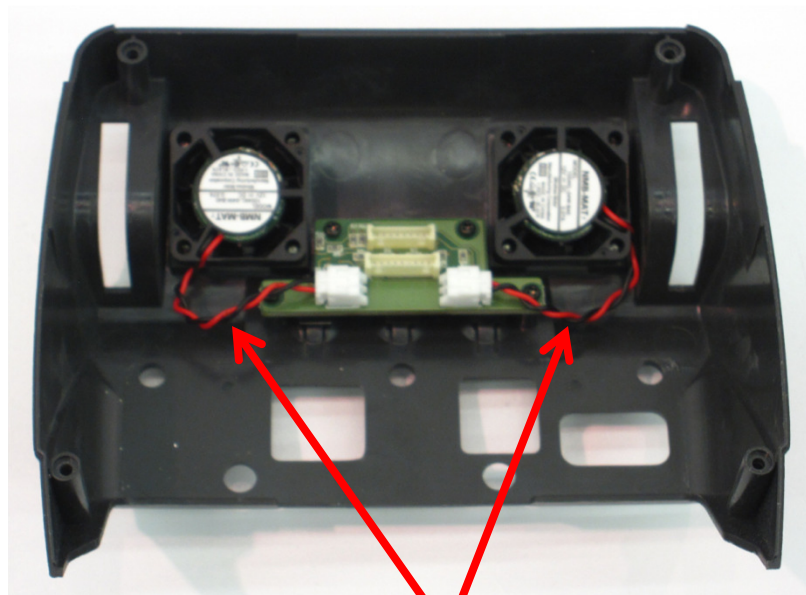


## 5-2 Power Switch Connection

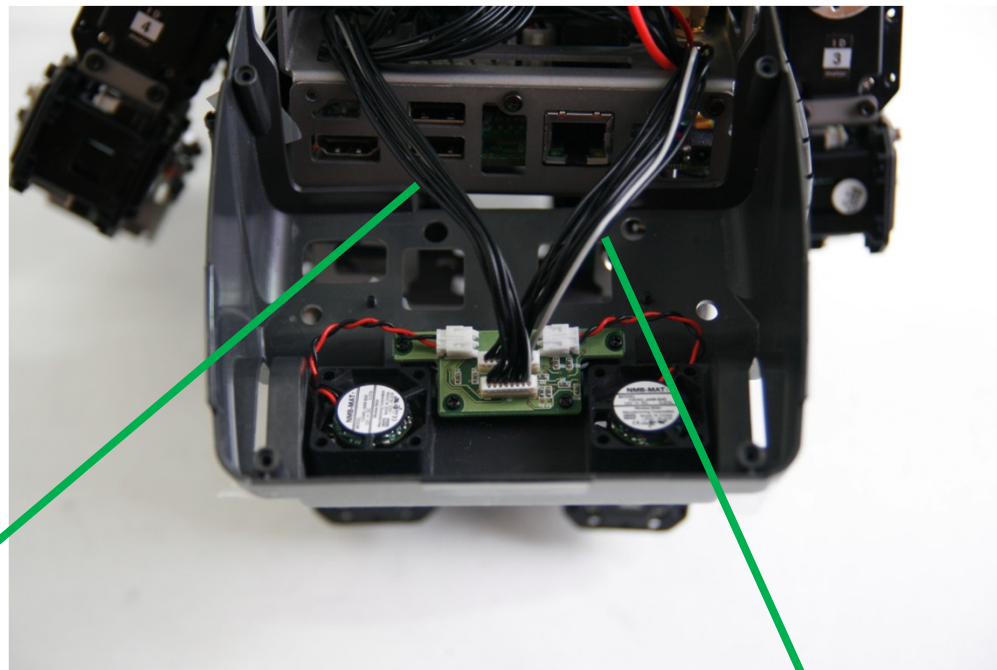


# 5. Chest Section Wiring

## 5-3 Fan Wiring

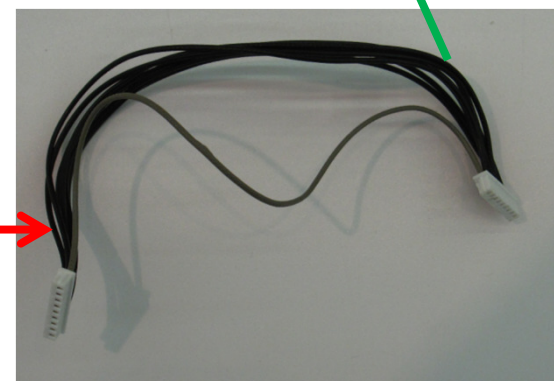


W1



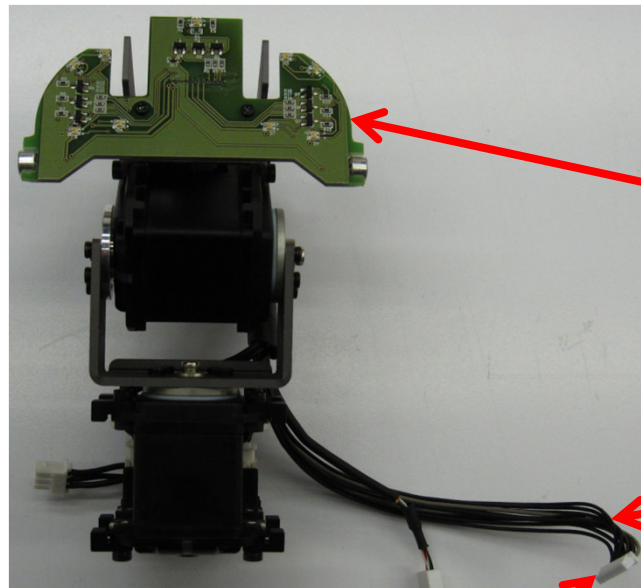
W2 (8-pins)

W3 (9-Pins)



# 5. Chest Section Wiring

## 5-4 Head PCB Connection to Main PCB

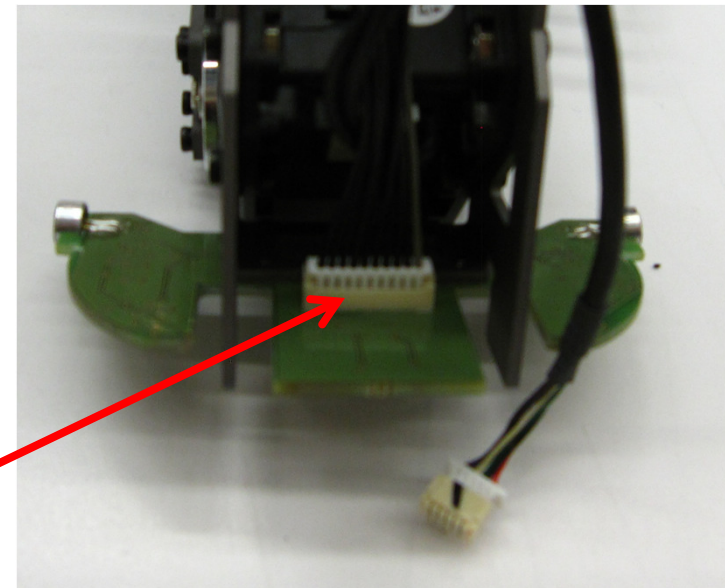


Front View

Connects to Main PCB

Head PCB

W12

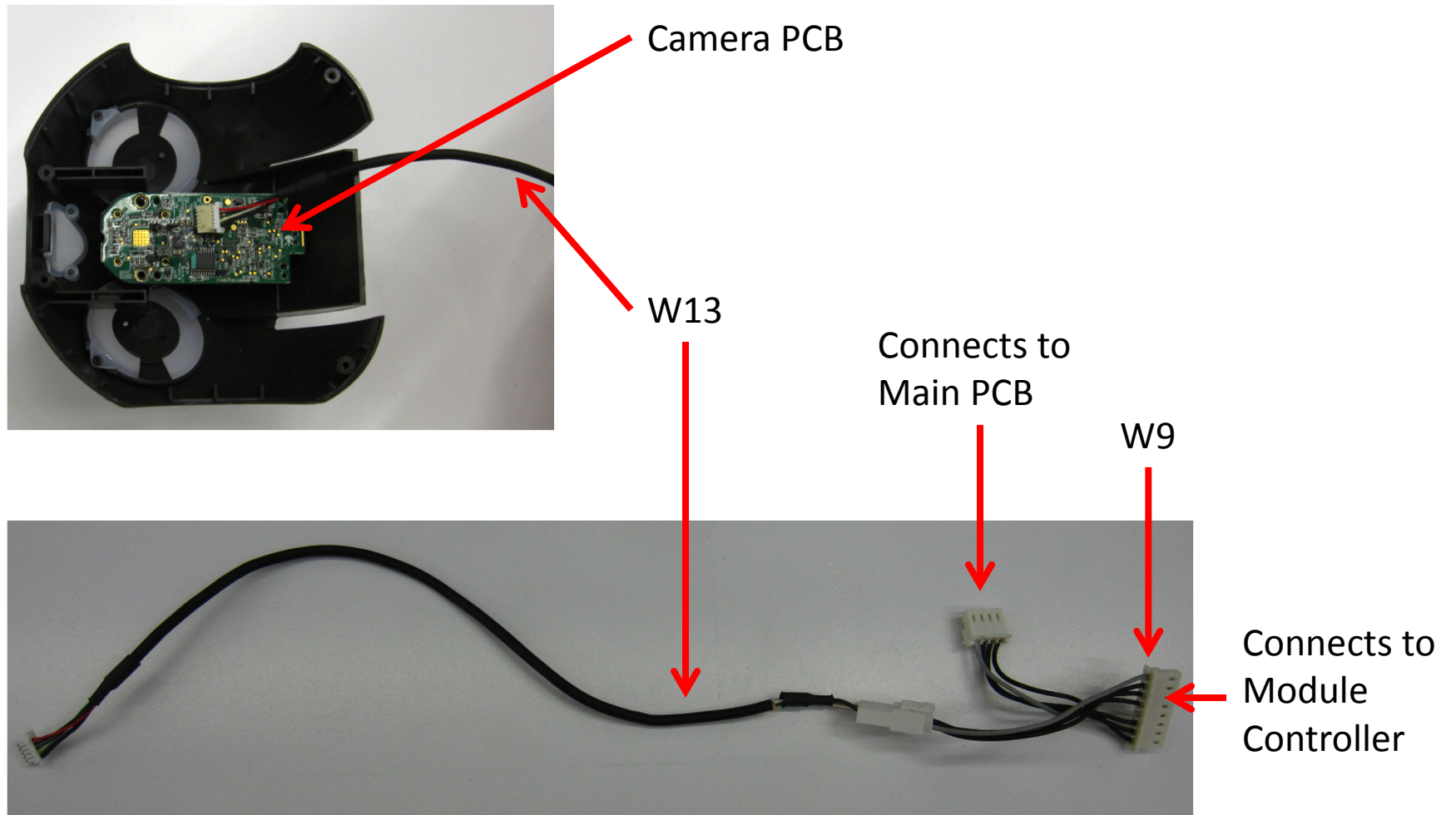


Back View



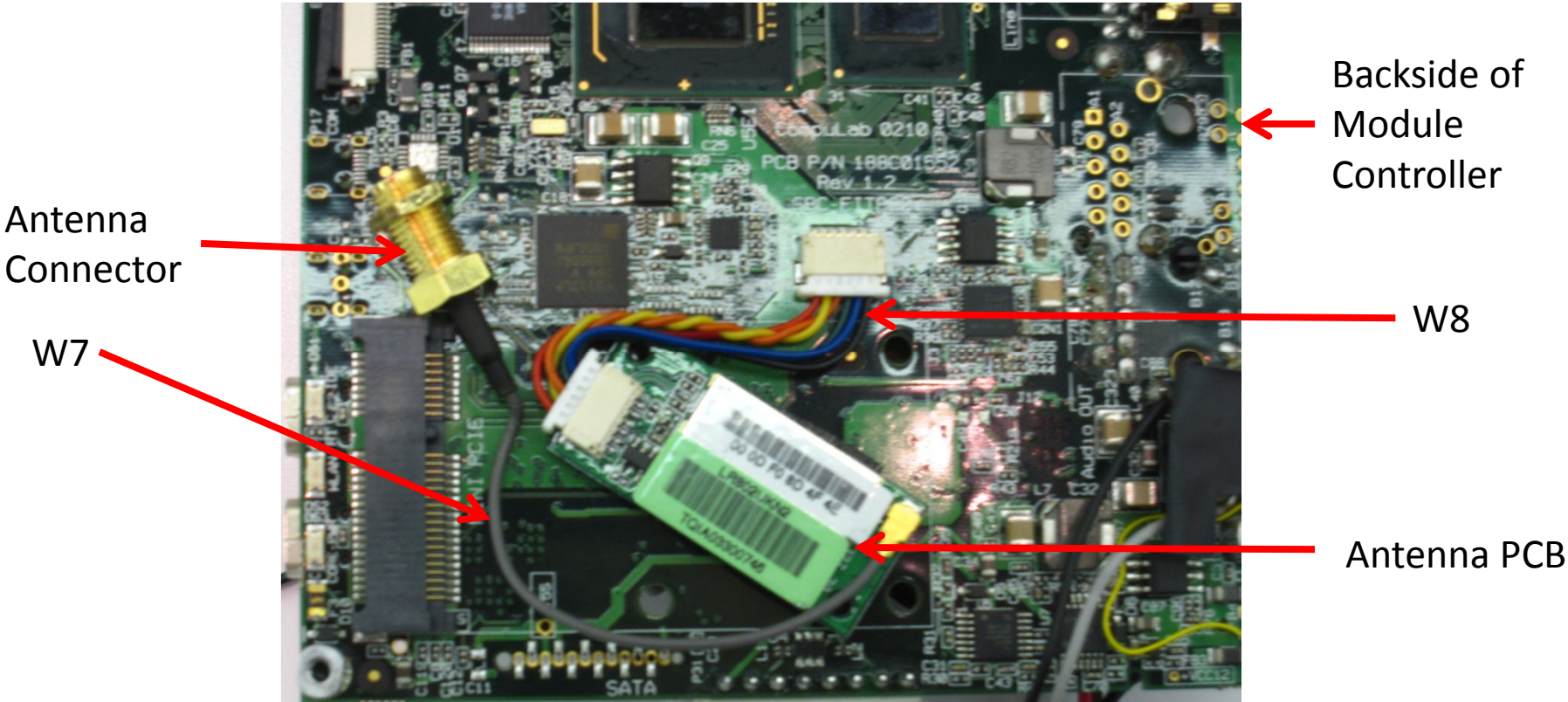
# 5. Chest Section Wiring

## 5-5 Camera PCB to Main PCB



# 5. Chest Section Wiring

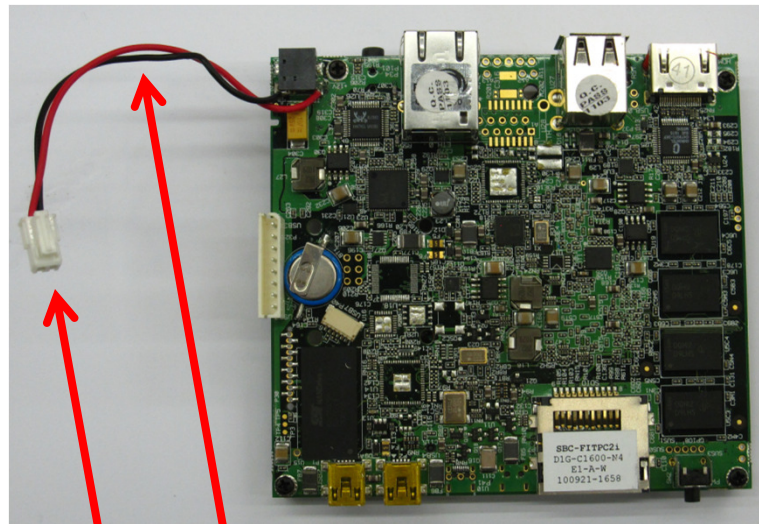
## 5-6 Antenna Wiring



# 5. Chest Section Wiring

## 5-7 Module Controller Connection to Main PCB

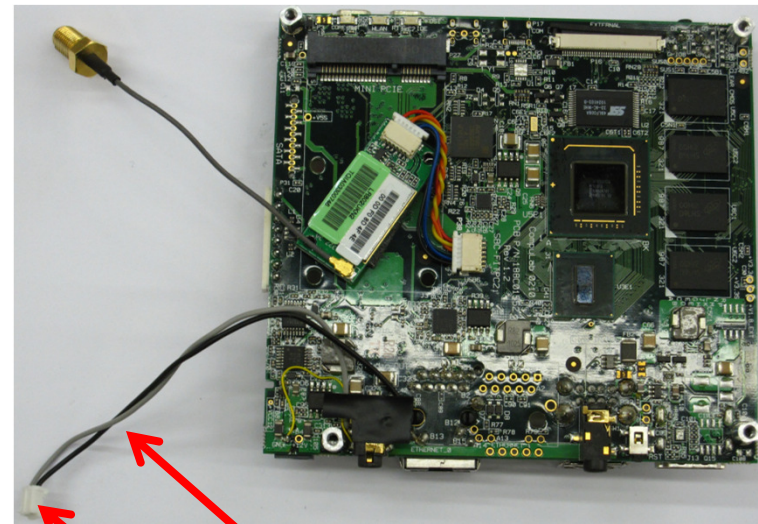
Module Controller Top Side



W10

Connects to Main PCB

Module Controller Bottom Side

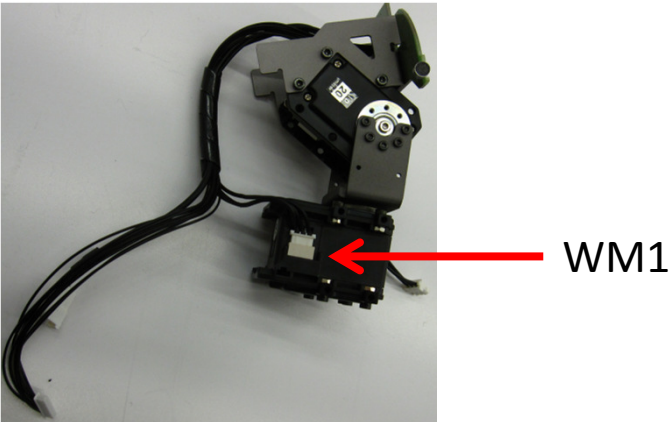
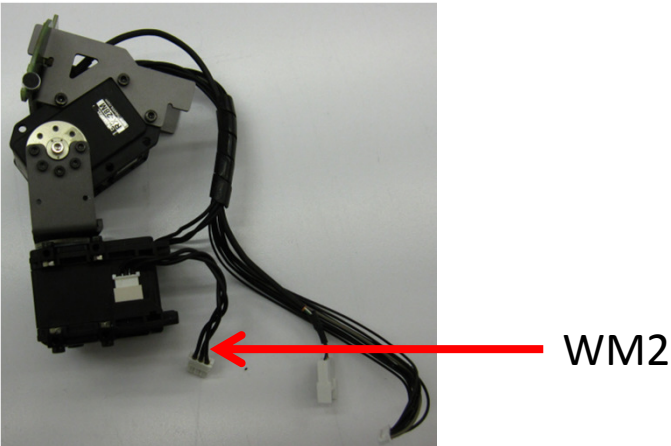
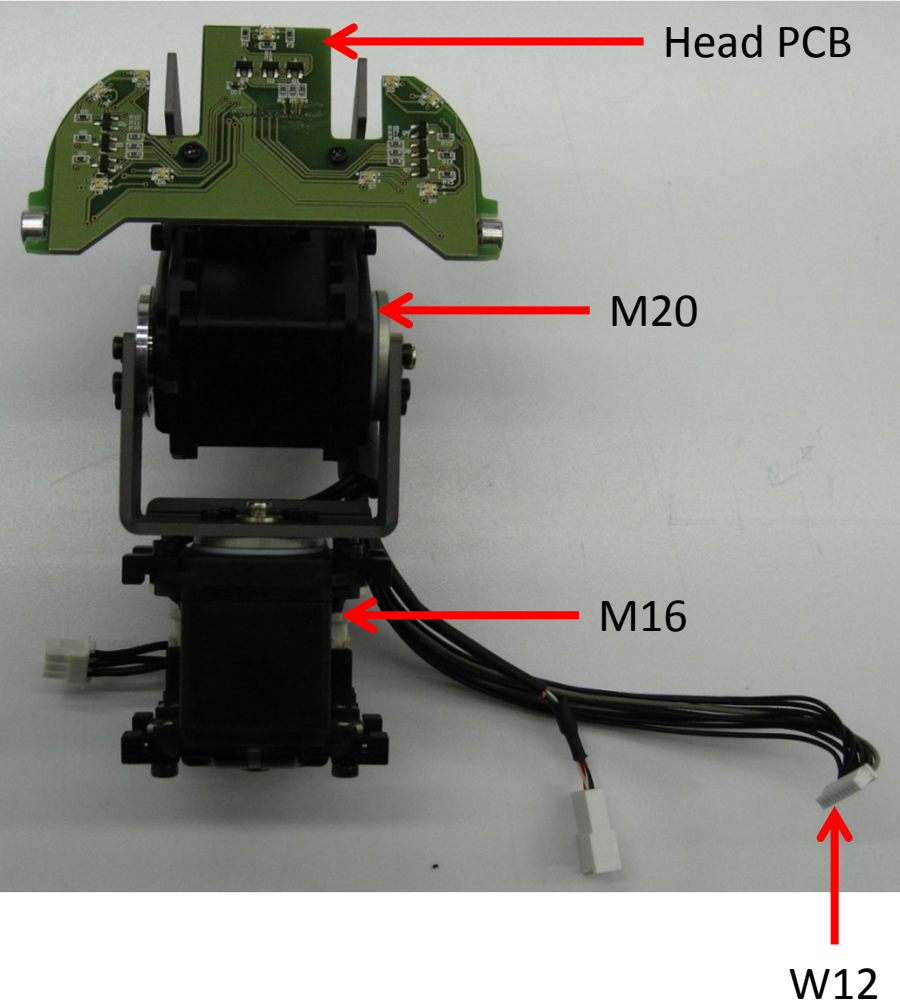


W9

Connects to Main PCB

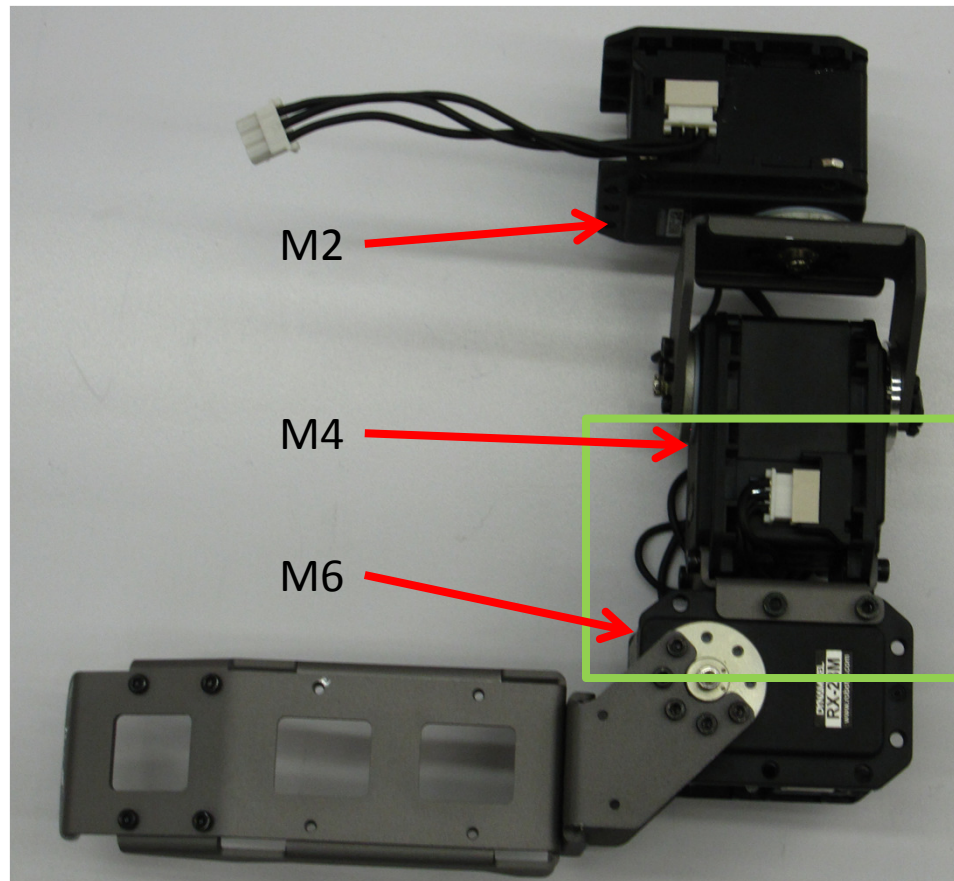
# 6. Motor Wire Routing

## 6-1 Routing for the Head

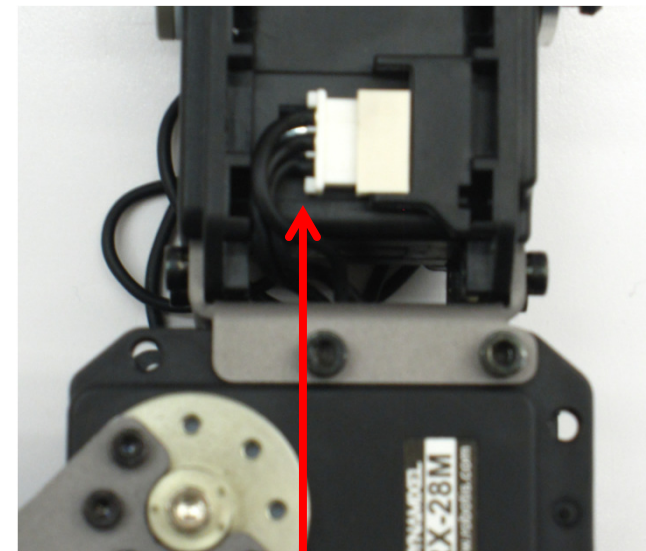


# 6. Motor Wire Routing

## 6-2 Routing for the Arms



Left Arm



WM9

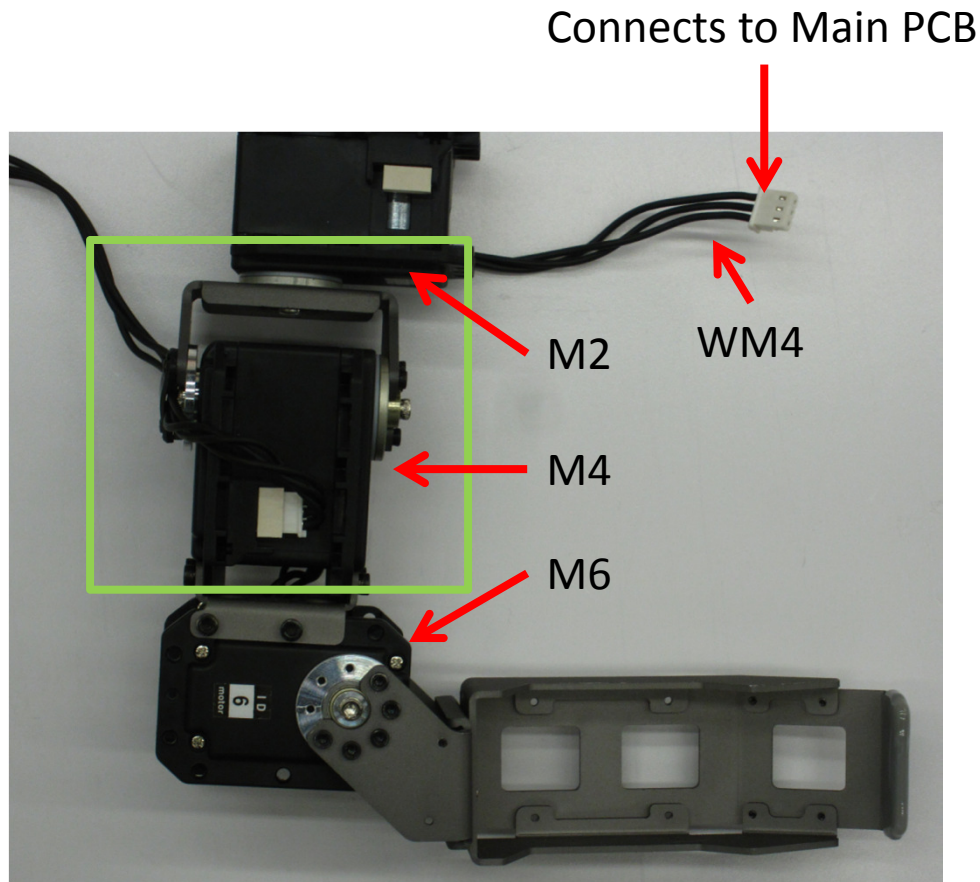
Wire WM9 should be fed through the center hole of the arm actuator mount before connecting to motor M4.

\* Note that the right arm will follow the same routing configuration

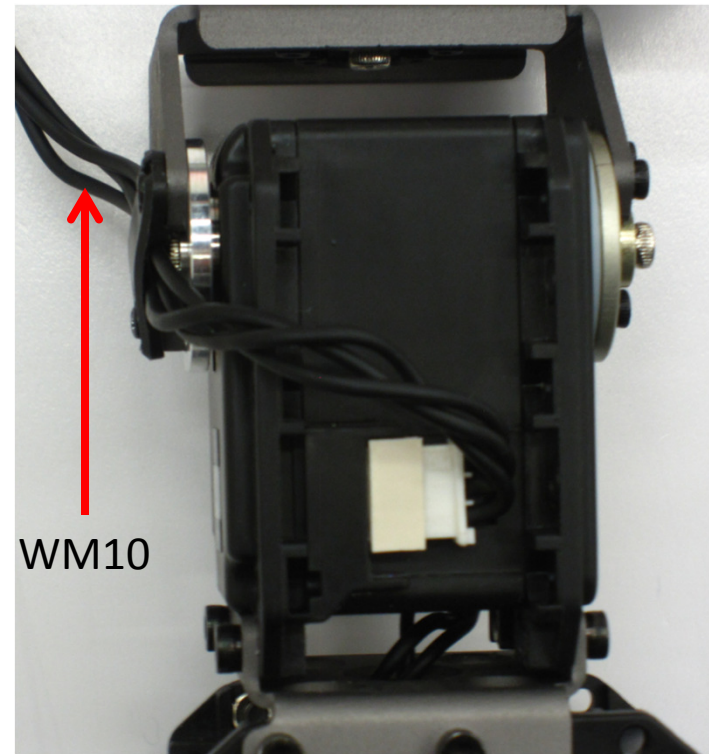


# 6. Motor Wire Routing

## 6-2 Routing for the Arms



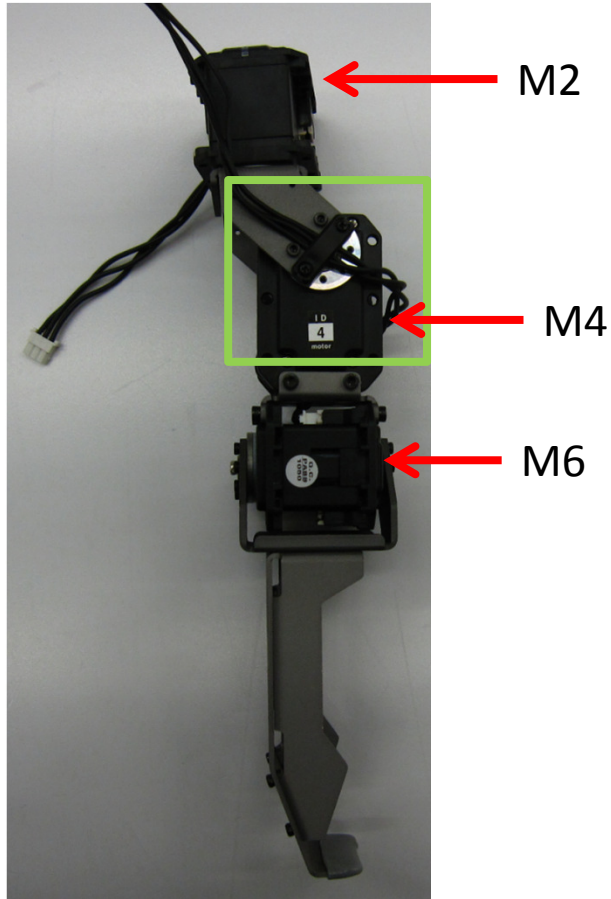
Left Arm



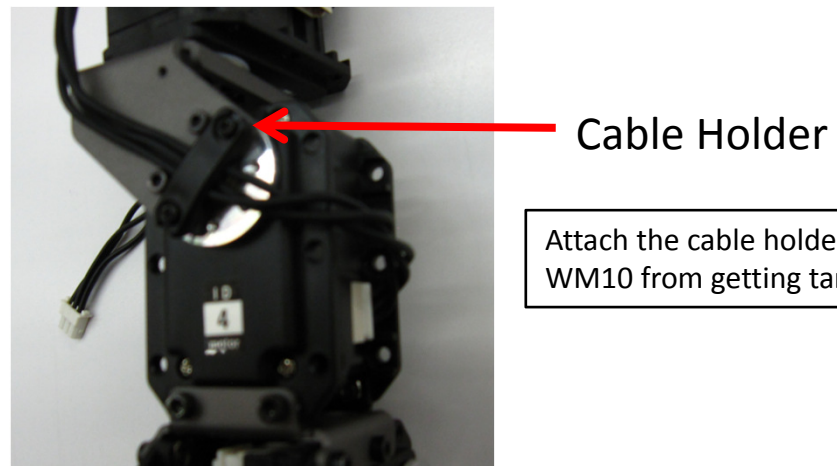
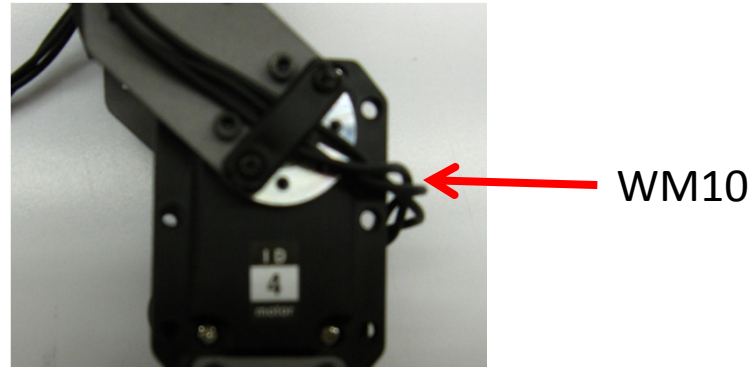
\* Note that the right arm will follow the same routing configuration

# 6. Motor Wire Routing

## 6-2 Routing for the Arms



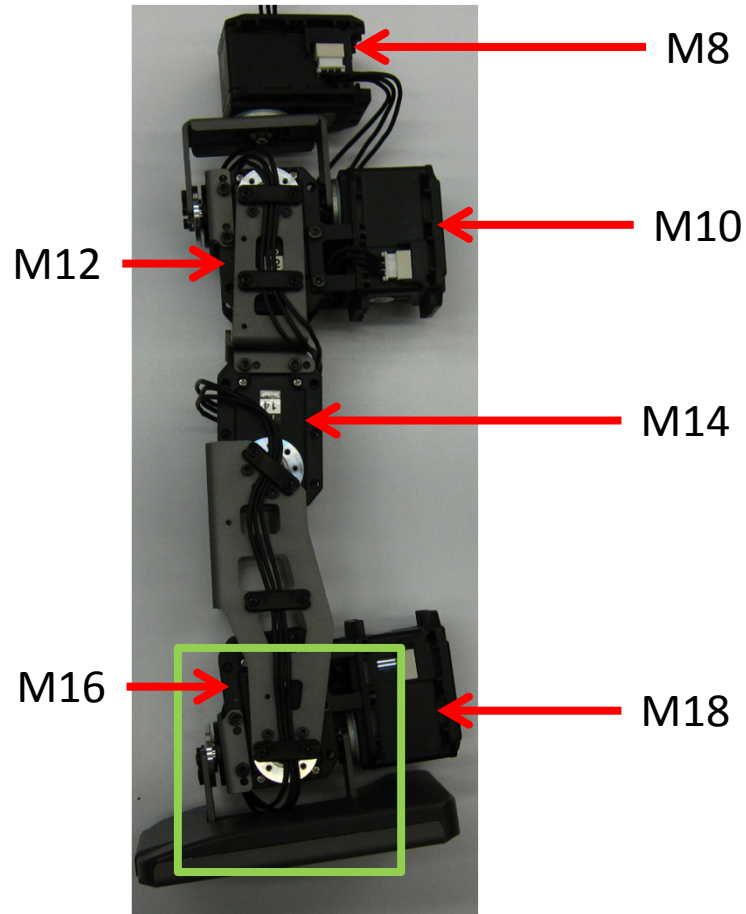
Left Arm



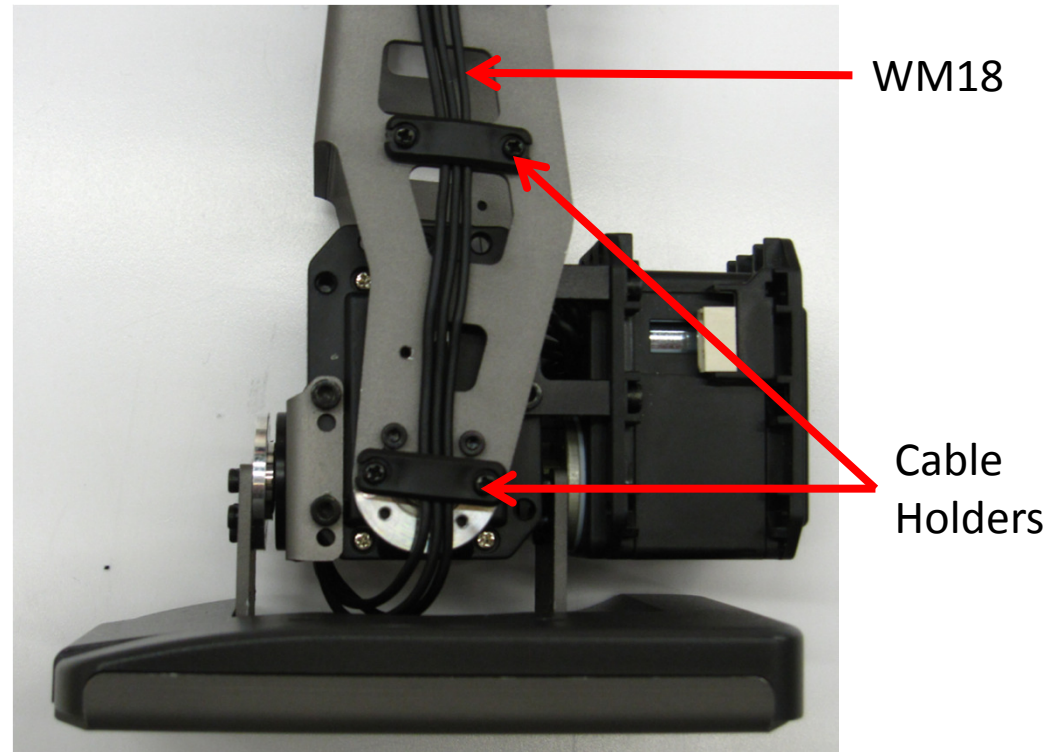
\* Note that the right arm will follow the same routing configuration

# 6. Motor Wire Routing

## 6-3 Routing for the Legs



Left Leg

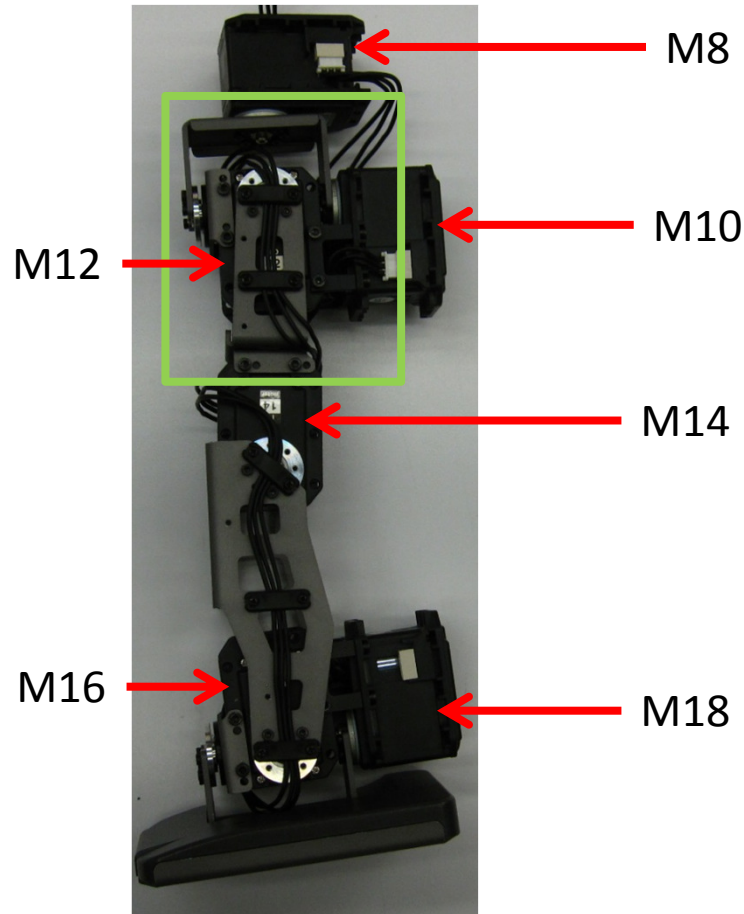


Attach the cable holders to keep wire WM18 from getting tangled.

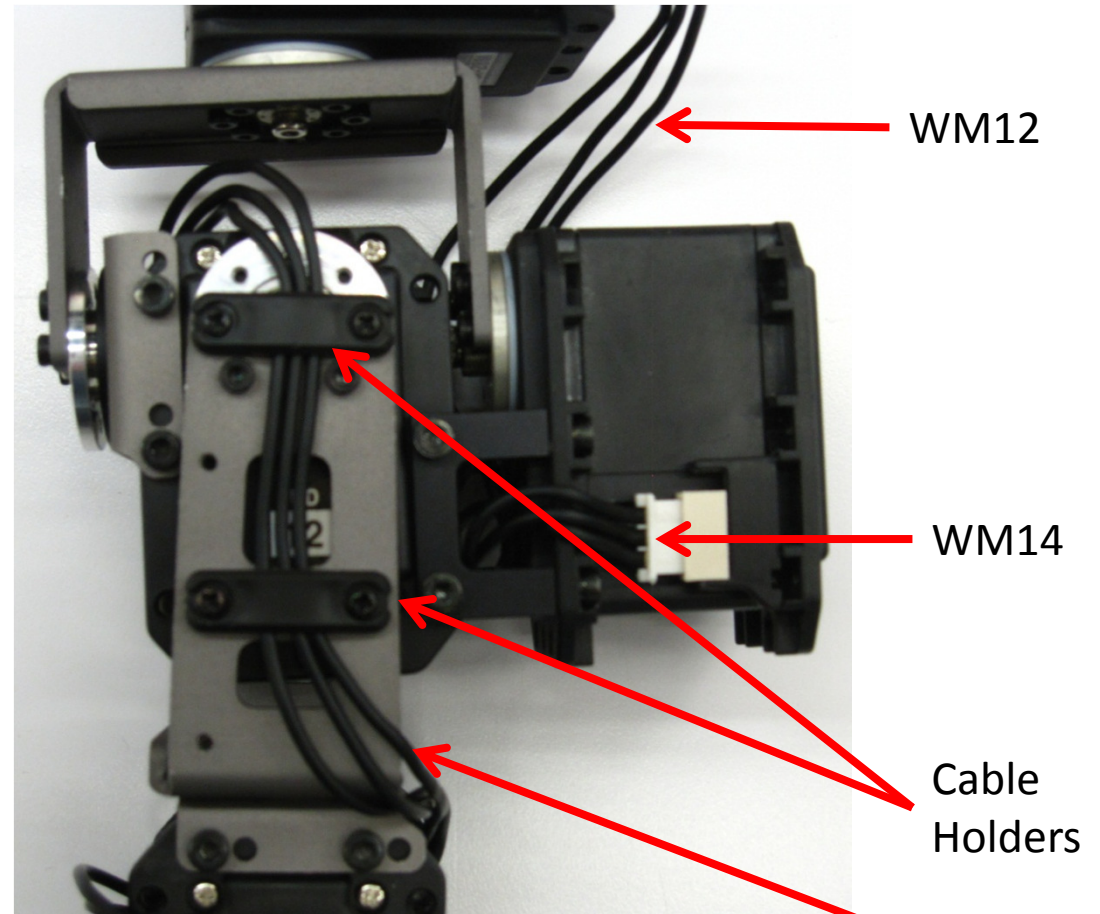
\* Note that the right leg will follow the same routing configuration

# 6. Motor Wire Routing

## 6-3 Routing for the Legs



Left Leg

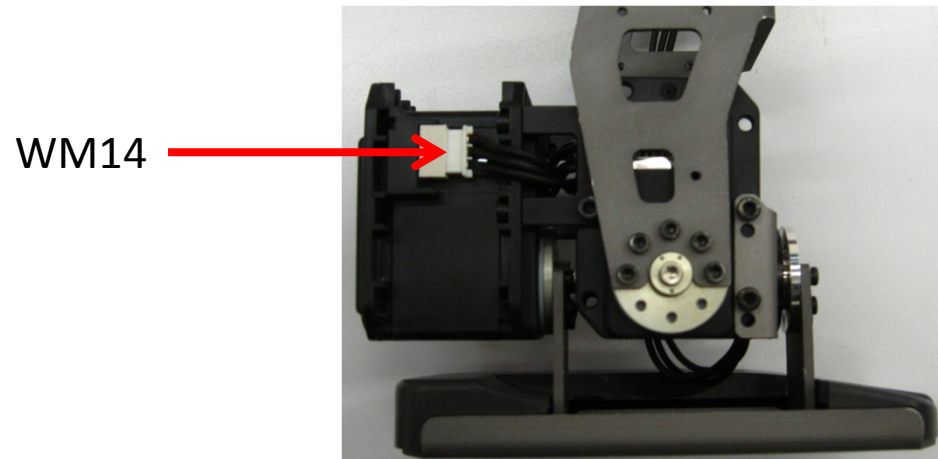
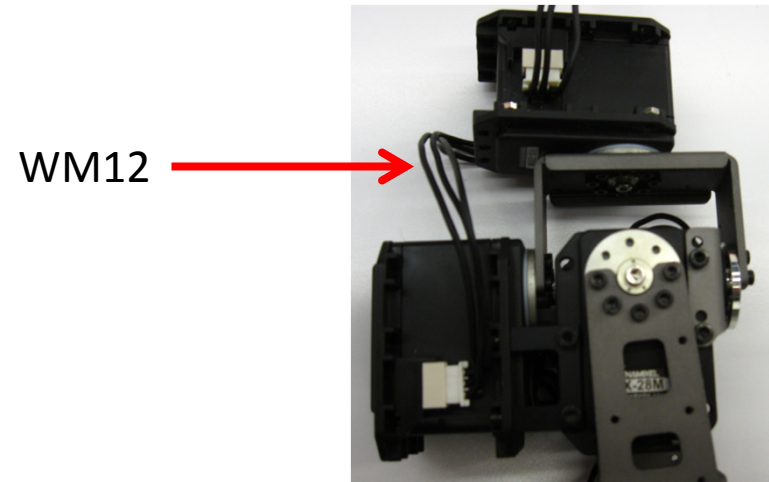
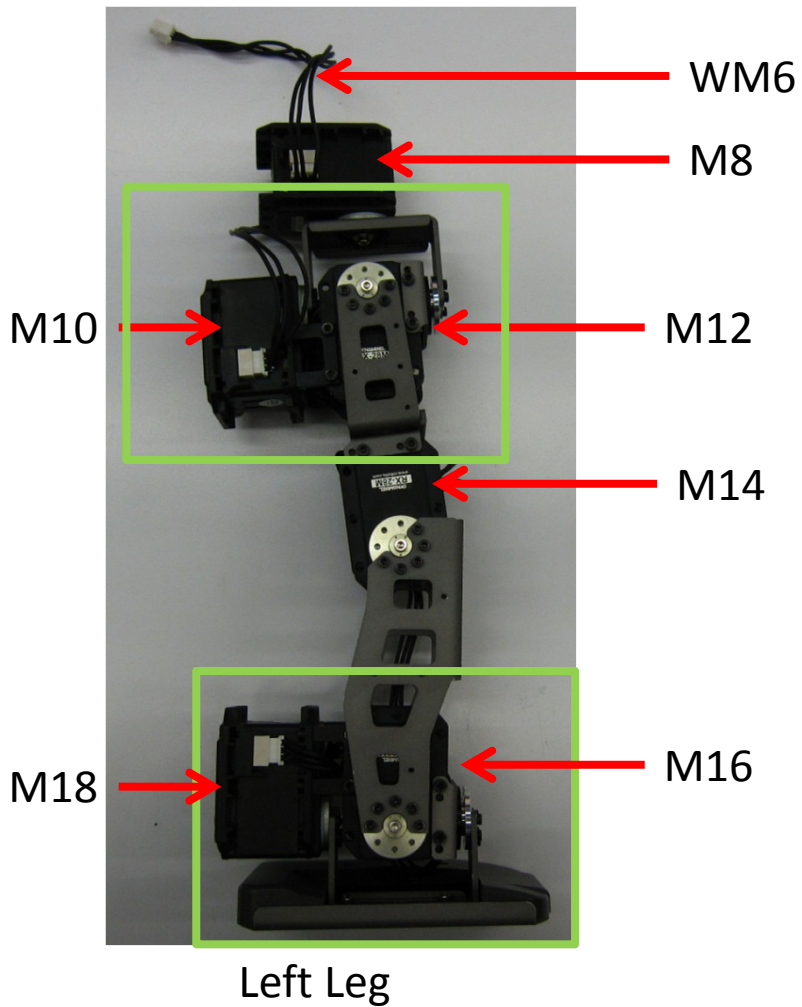


Attach the cable holders to keep wire WM16 from getting tangled.

\* Note that the right leg will follow the same routing configuration

# 6. Motor Wire Routing

## 6-3 Routing for the Legs



\* Note that the right leg will follow the same routing configuration



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