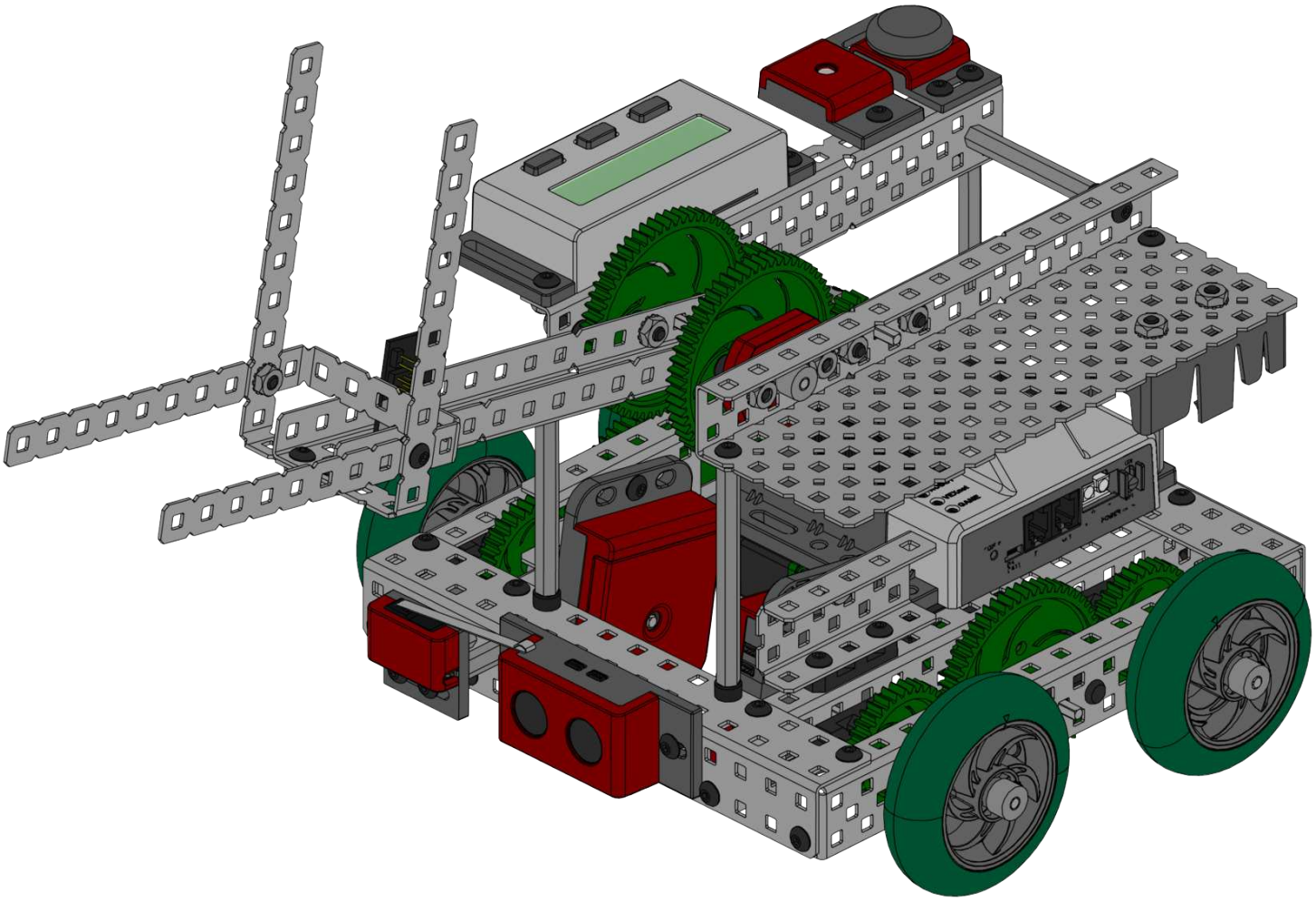
SQUAREBOT 4.0 BUILDING INSTRUCTIONS



USING THE VEX CORTEX

SQUAREBOT 4.0 BUILDING INSTRUCTIONS

1 Collect parts and tools from the lists below:

Materials	Quantity
Screw, 8-32 x 1/4" Long	31
Screw, 8-32 x 1/2" Long **	16
Screw, 8-32 x 3/8" Long	15
Screw, 8-32 x 3/4" Long	1
Motor Screw, Long [1/2"]	4
Nut, 8-32 Keps**	49
Shaft, 4" long*†	2
Shaft, 3" long	4
Shaft, 2" long	2
Shaft Collar	20
Shaft Spacer Thin (4.6mm)	12
Shaft Spacer Thick (8mm)	1
Bearing, Flat	16
Bearing Pop Rivets	20
Standoff, 3" Long	4
Standoff, 2" Long	2
Standoff, 1" Long	2
Gear, 60 tooth	4
Gear, 36 tooth	4
Gear, 12 tooth	2
Chassis Rail, 16 hole	4
Chassis Bumper, 15 hole	2
C-Channel, 1x2x1x15 hole	2
C-Channel, 1x2x1x25 hole	1
Plate, 5 x 15 hole	1
Small Low Friction VEX Wheel	4
VEX Cortex Microcontroller*	1
LCD Display*	1
VEX Motor w/ Clutch	3
Optical Shaft Encoder*	2
Ultrasonic Rangefinder*	1
Potentiometer*	1
Bumper Sensor*	1
Limit Switch*	1
Analog Accelerometer*	1
Light Sensor*	
Backup Battery Holder*	1

Tools	Quantity
Zip Tie, 4" Long	4
Battery Strap*	1
Rubber Bands	2
Allen Wrench 3/32"	1
Allen Wrench 5/64"	1
Open End Wrench 1/4"	1
Pliers*	1
Hacksaw*	1

* Not included in Protobot Robot Kit

** Total includes parts from the Sensor Kits

† The Protobot Robot Kit contains only one

SQUAREBOT 4.0 BUILDING INSTRUCTIONS

2 Modifications

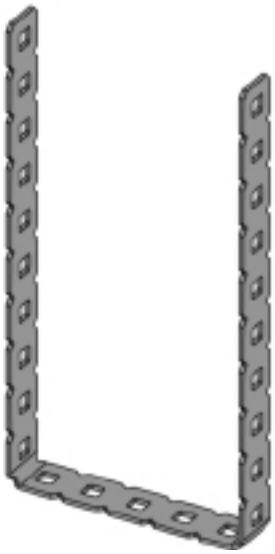
CAUTION - Bending VEX Metal

The following step involves permanent alterations to the materials in the VEX Kit. Make sure you have permission before continuing.

ALL APPLICABLE SAFETY PROCEDURES MUST BE OBSERVED WHILE PERFORMING THIS STEP. IF YOU ARE UNSURE ABOUT HOW TO USE THE TOOLS OR PERFORM THIS PROCEDURE SAFELY, DO NOT ATTEMPT THIS STEP ALONE. SEEK QUALIFIED ASSISTANCE BEFORE PROCEEDING.

A

B



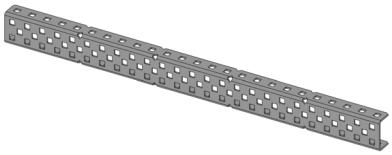
SQUAREBOT 4.0 BUILDING INSTRUCTIONS

2 Modifications *(continued)*

CAUTION - Cutting Tools

The following step involves cutting tools and permanent alterations to the materials in the VEX Kit. Make sure you have permission before continuing.

ALL APPLICABLE SAFETY PROCEDURES MUST BE OBSERVED WHILE PERFORMING THIS STEP. IF YOU ARE UNSURE ABOUT HOW TO USE THE TOOLS OR PERFORM THIS PROCEDURE SAFELY, DO NOT ATTEMPT THIS STEP ALONE. SEEK QUALIFIED ASSISTANCE BEFORE PROCEEDING.



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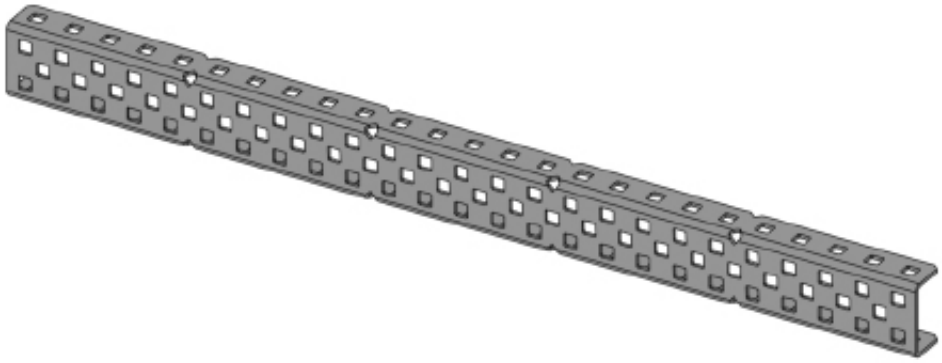

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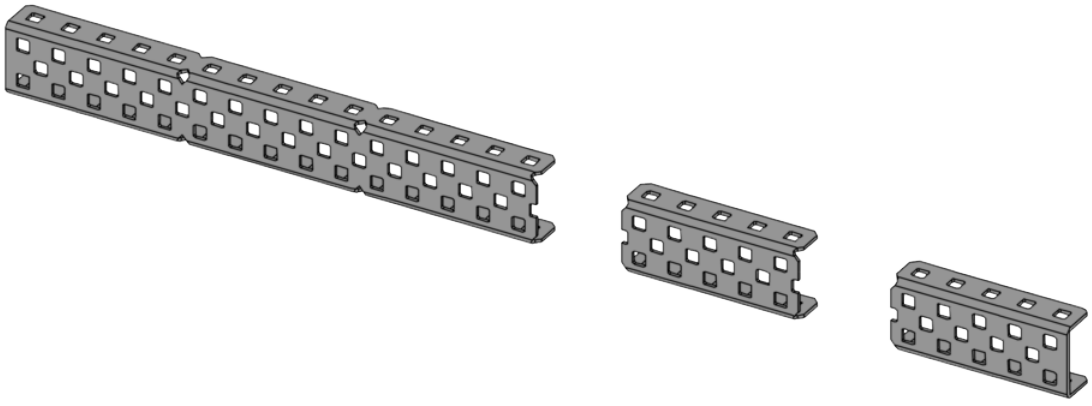
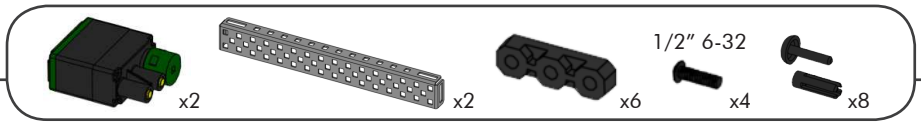
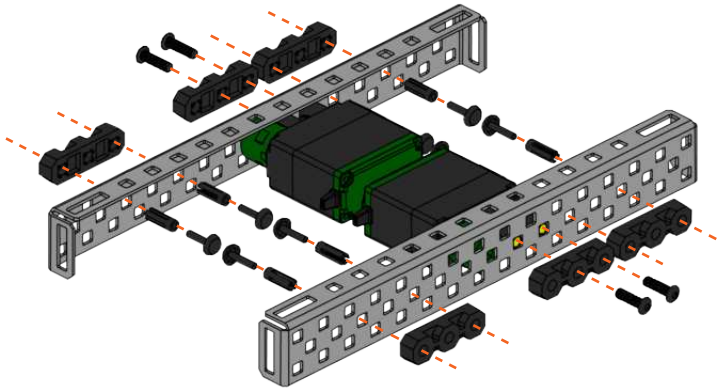
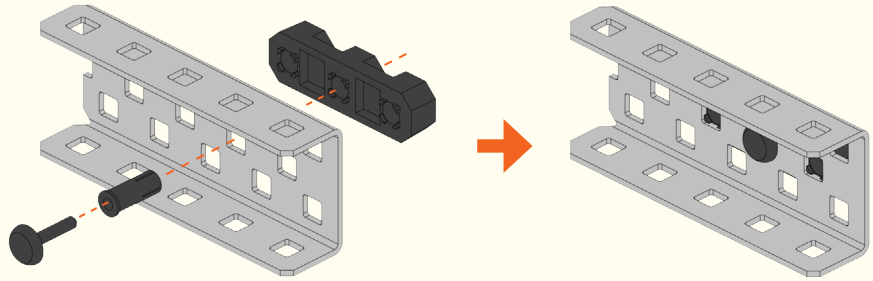


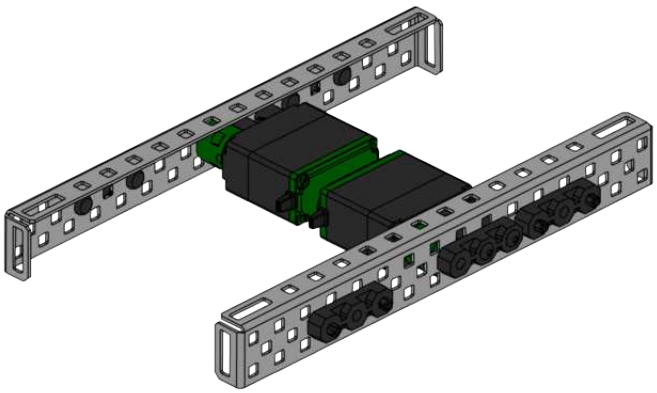
3 Base Frame Construction





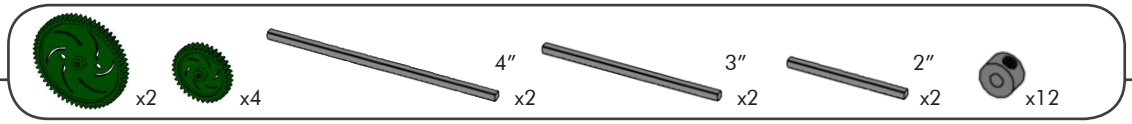
Building Tip - Using Pop Rivets

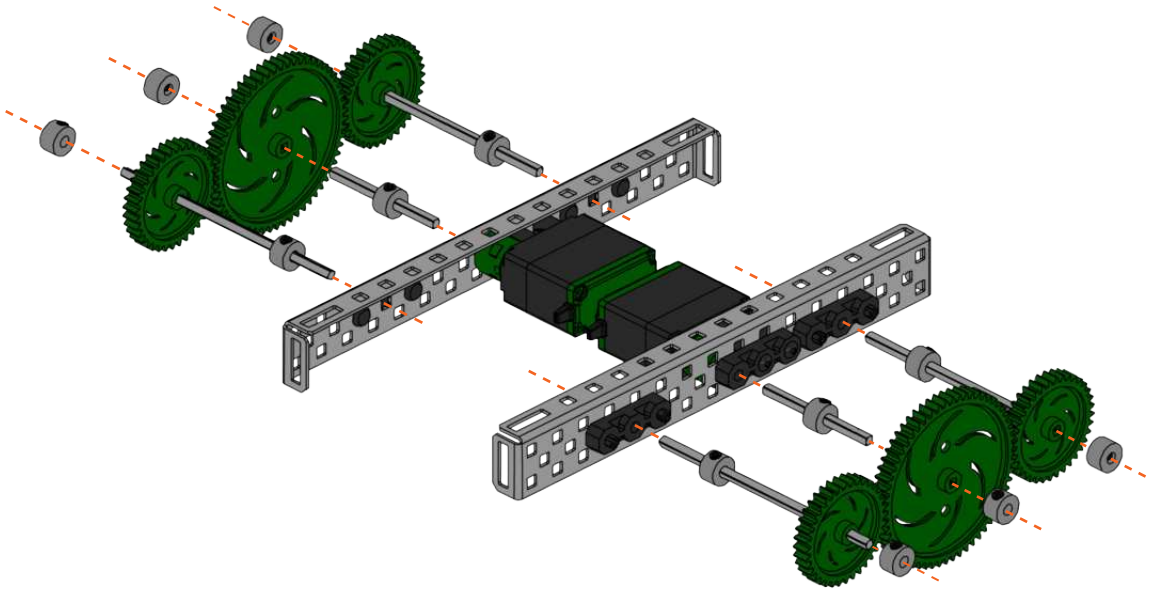




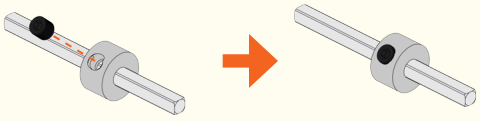
SQUAREBOT 4.0 BUILDING INSTRUCTIONS

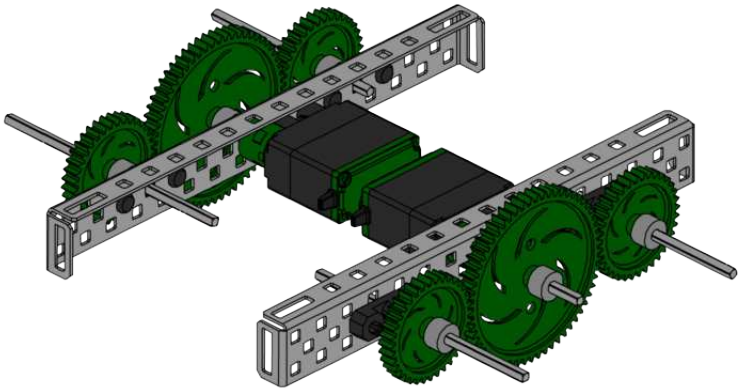
4 Drivetrain Construction





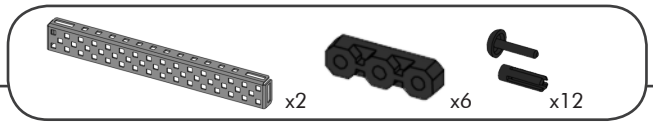
Building Tip - Using Shaft Collars

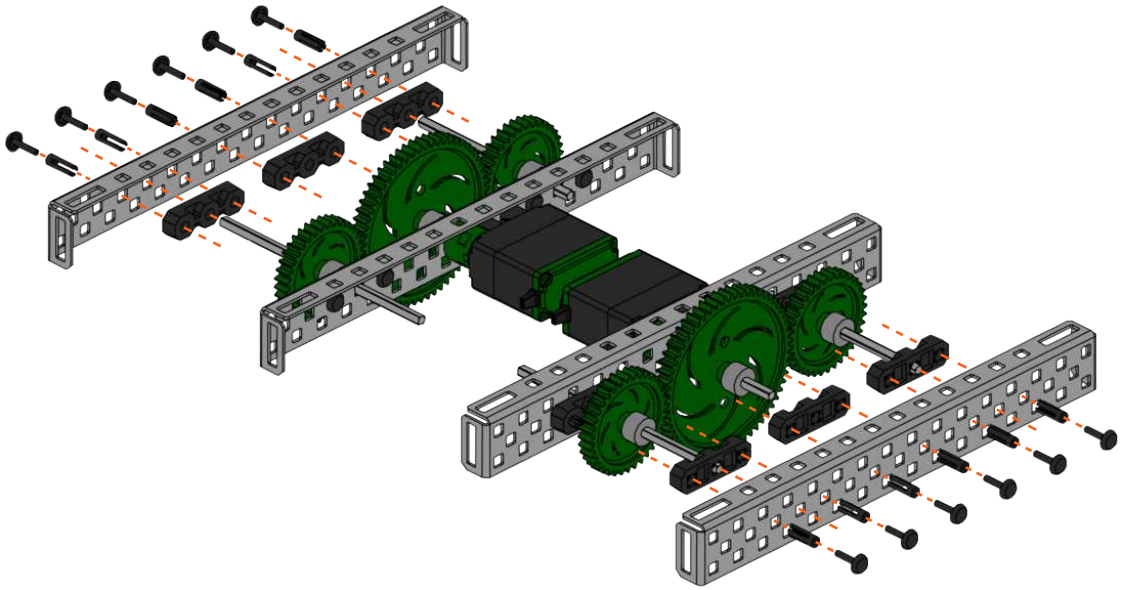


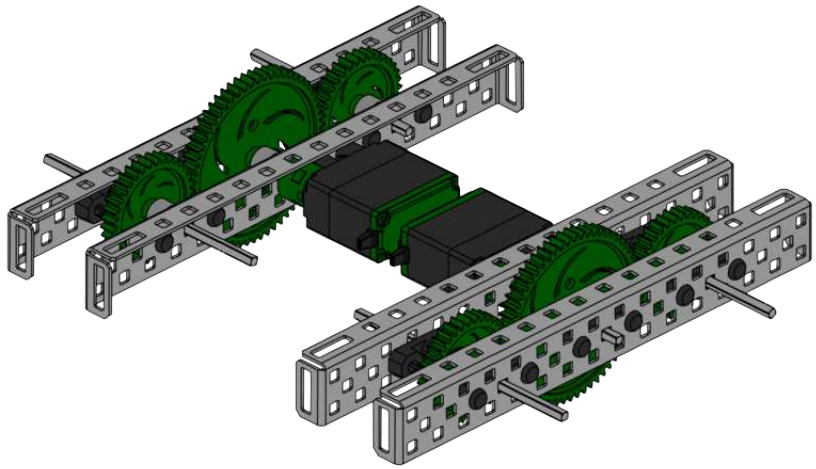


SQUAREBOT 4.0 BUILDING INSTRUCTIONS

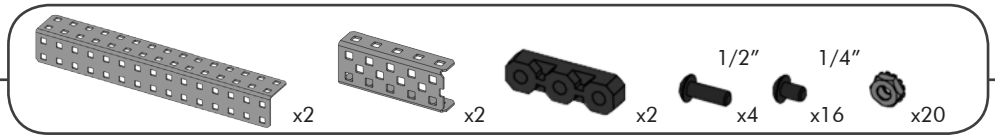
4 Drivetrain Construction *(continued)*

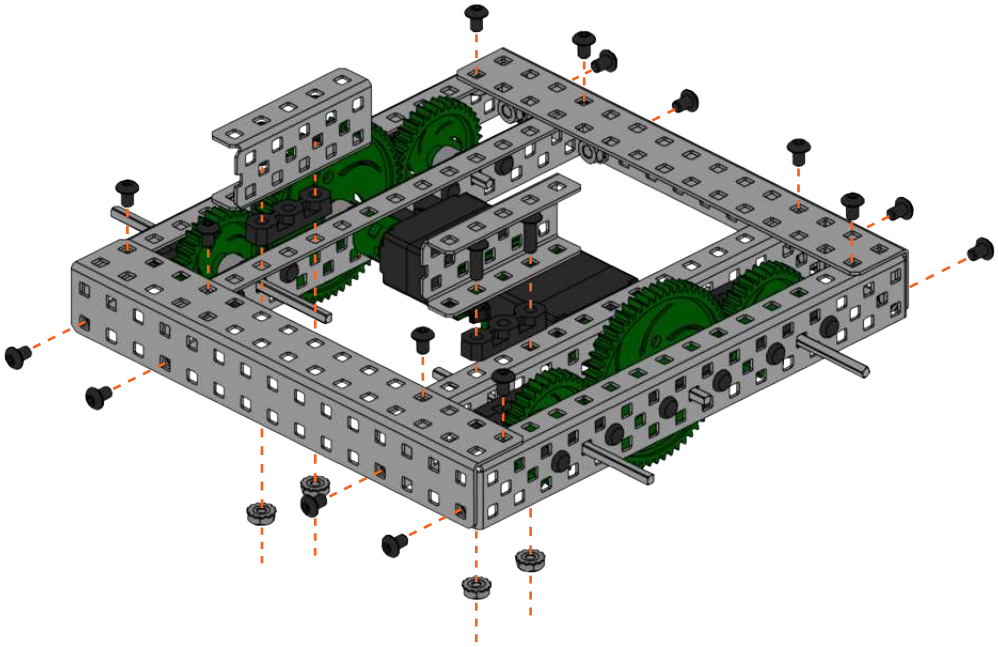


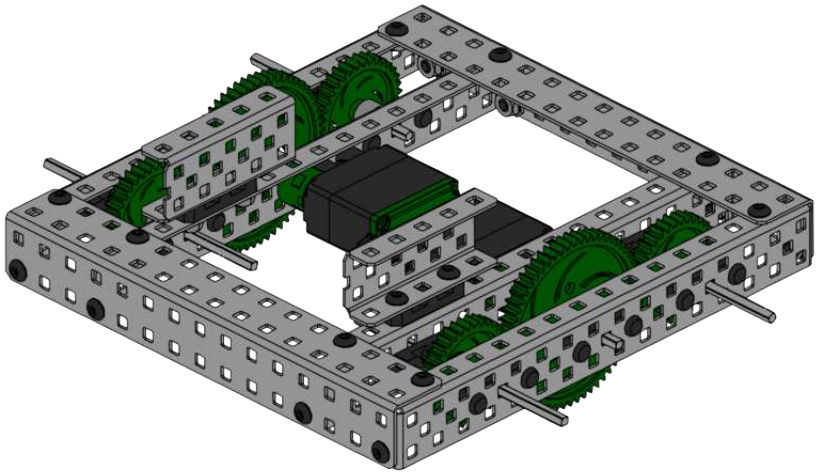




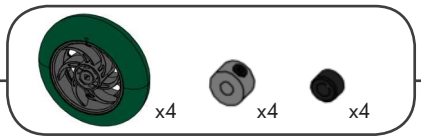
4 Drivetrain Construction *(continued)*

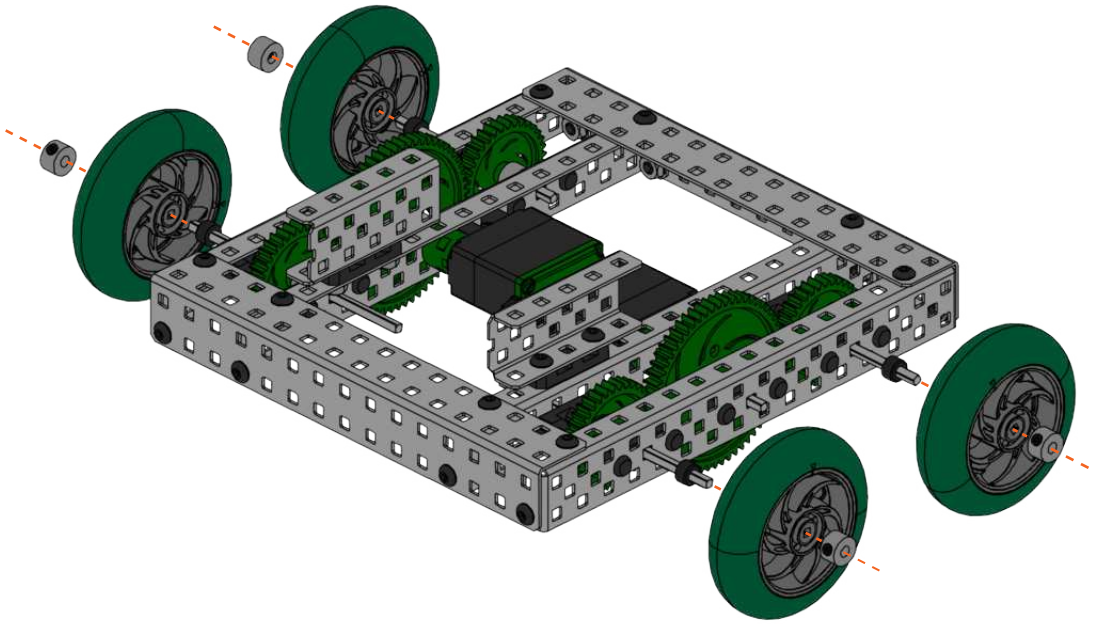


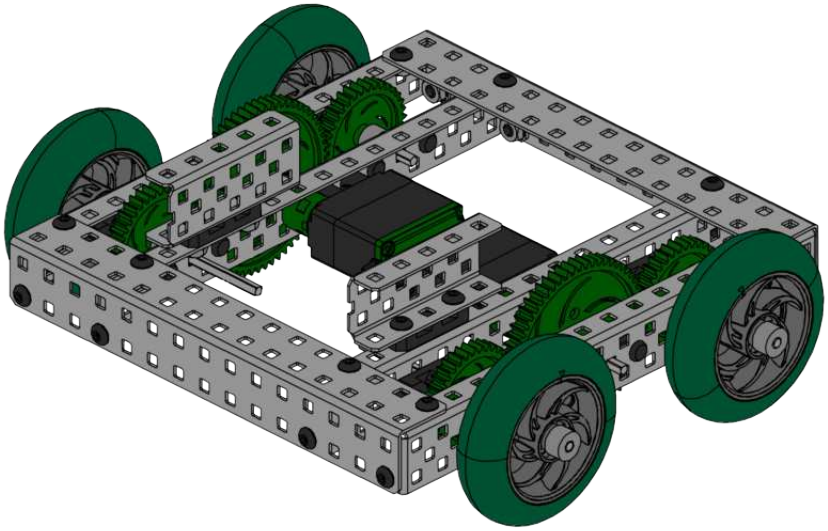




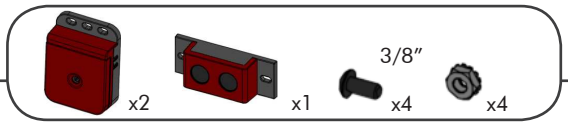
4 Drivetrain Construction *(continued)*

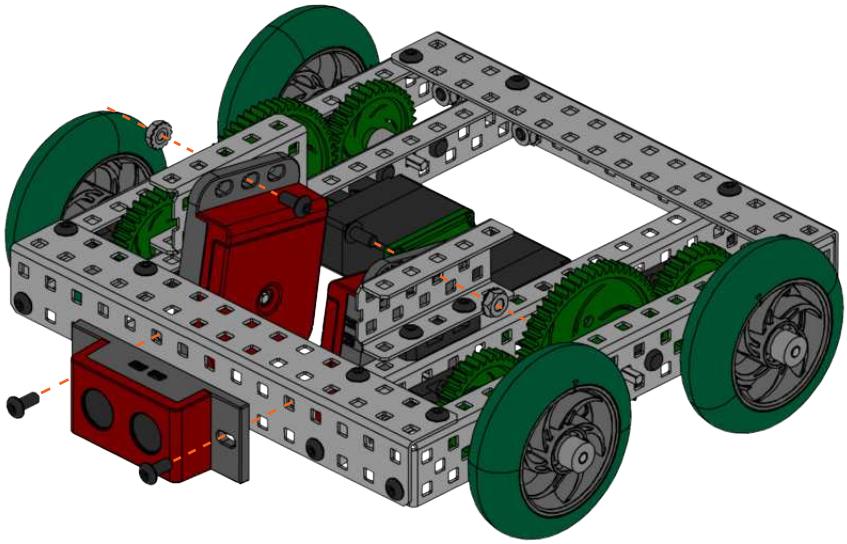


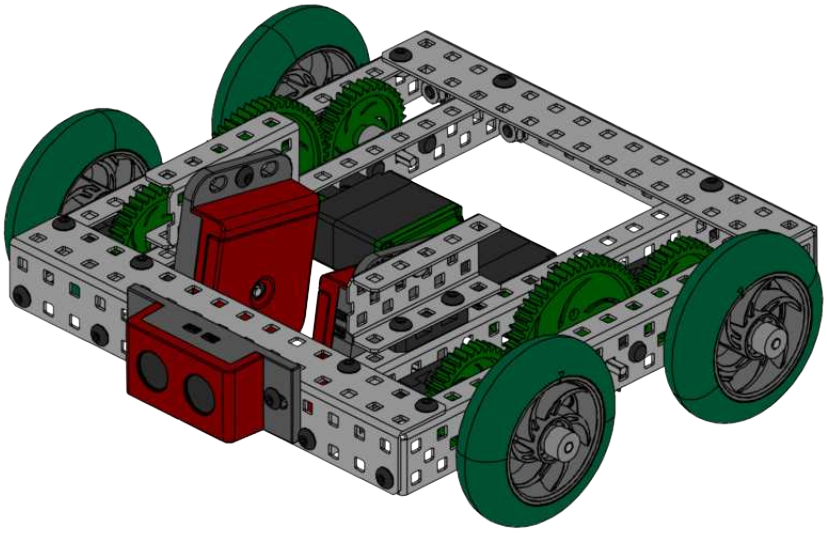




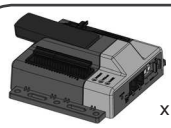
4 Drivetrain Construction *(continued)*

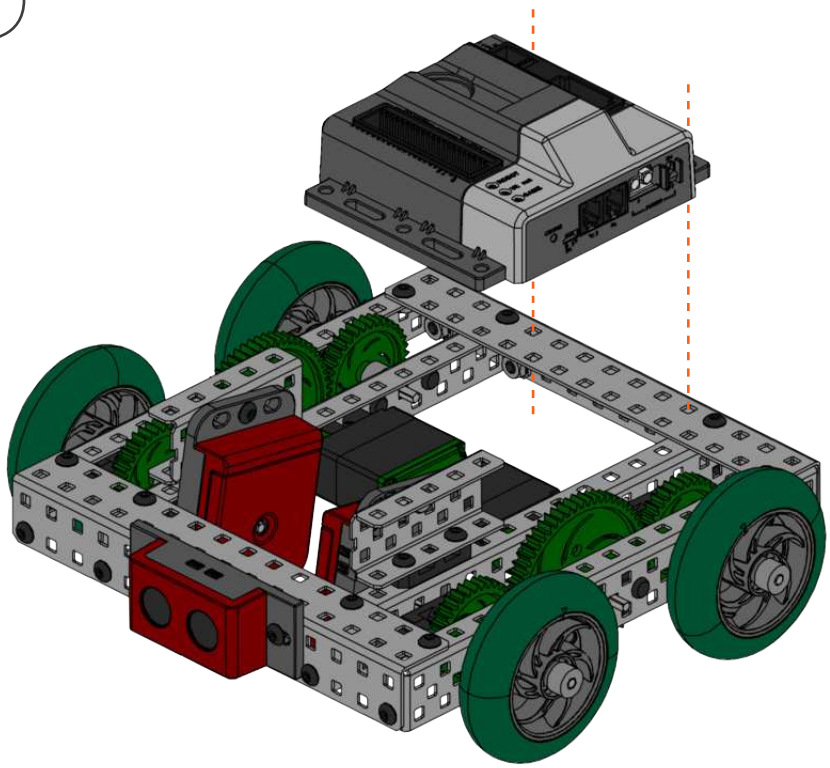


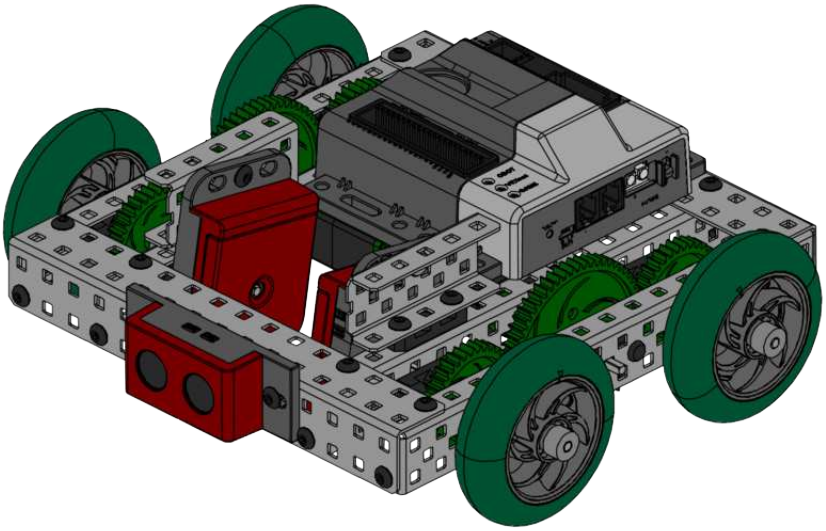




4 Drivetrain Construction *(continued)*

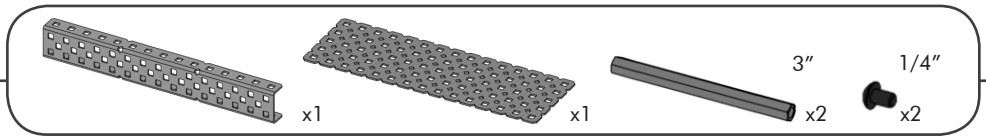


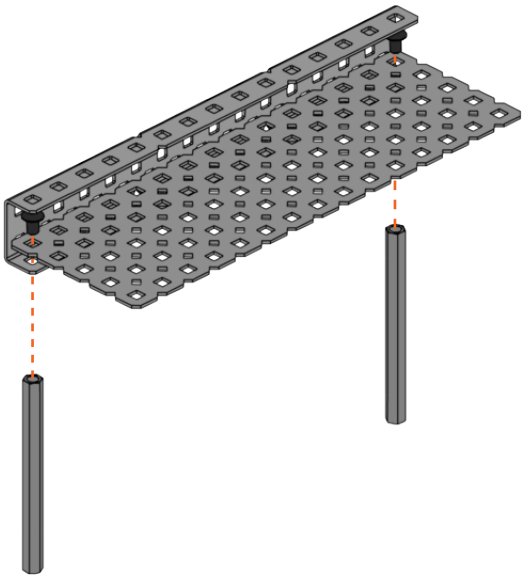


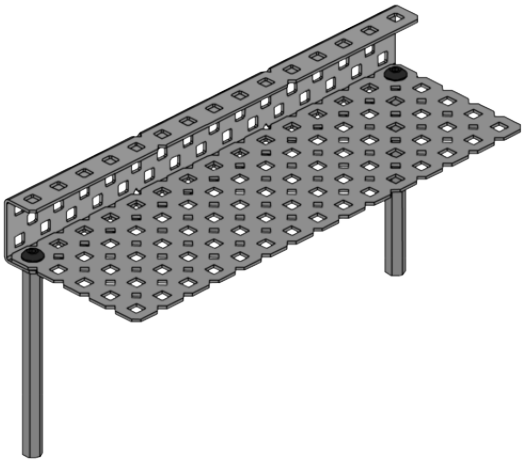


SQUAREBOT 4.0 BUILDING INSTRUCTIONS

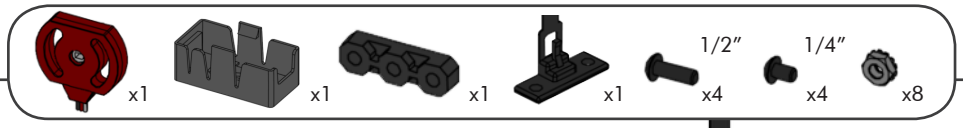
5 Arm Mount Construction

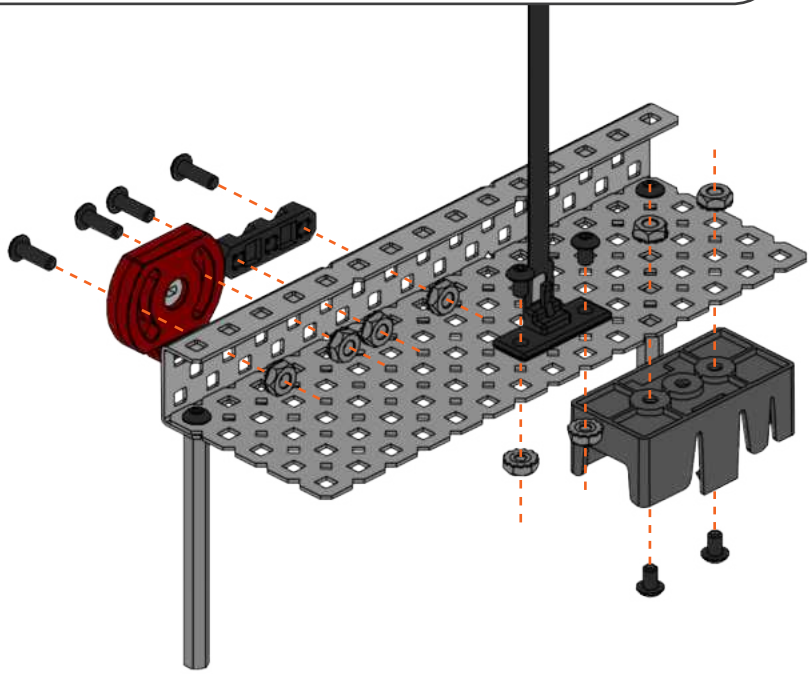


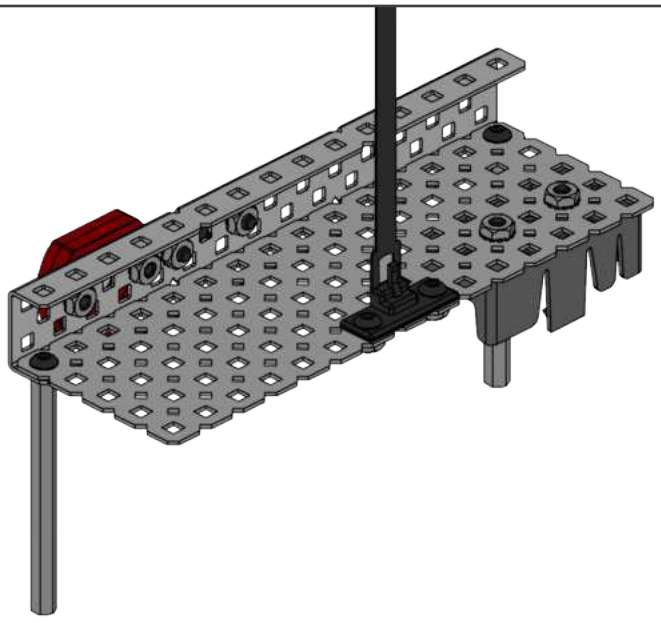




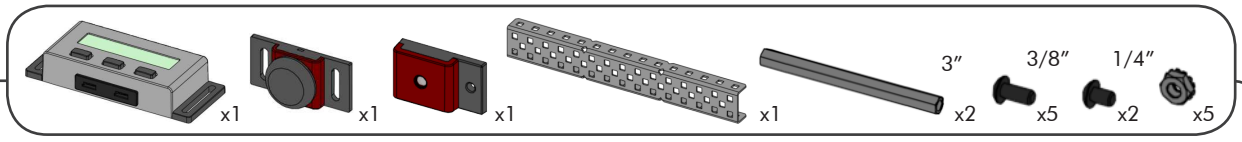
5 Arm Mount Construction *(continued)*

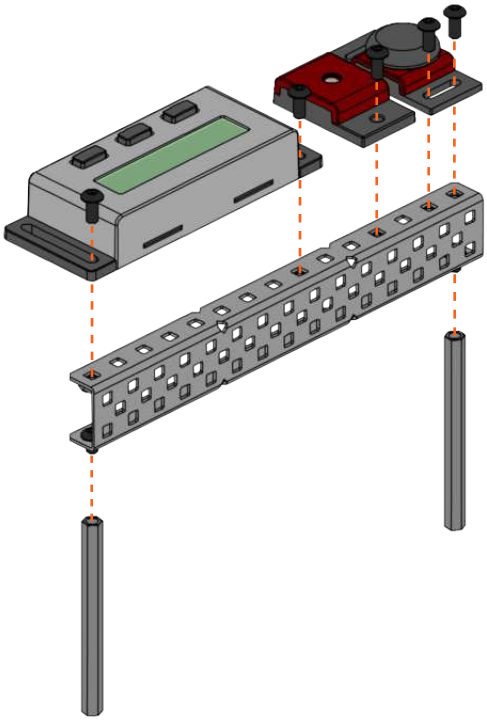


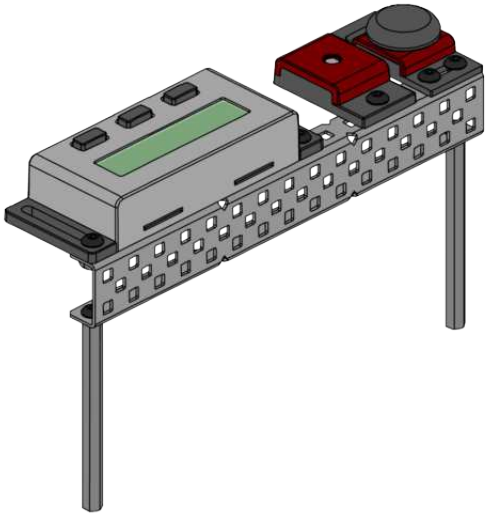




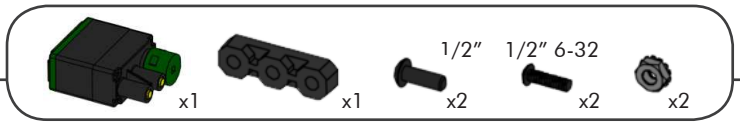
5 Arm Mount Construction *(continued)*

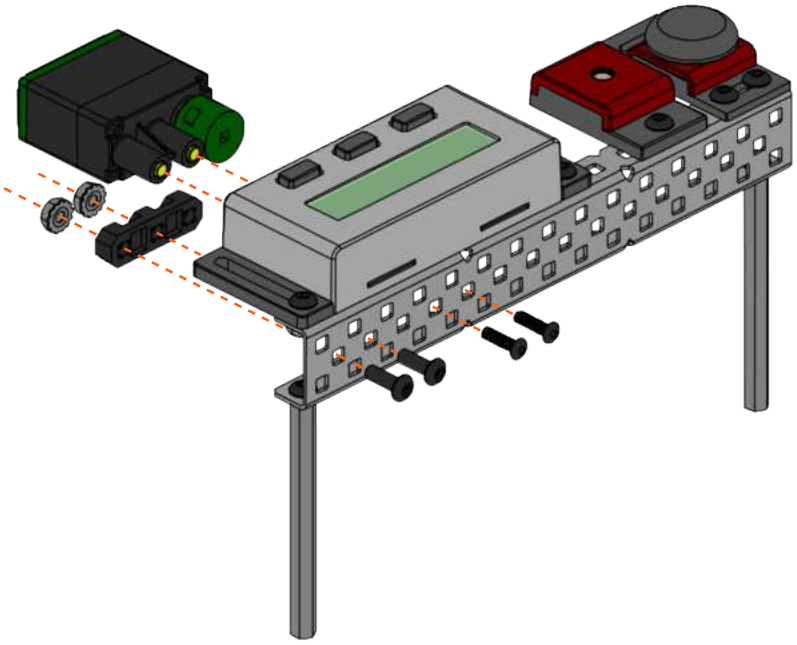


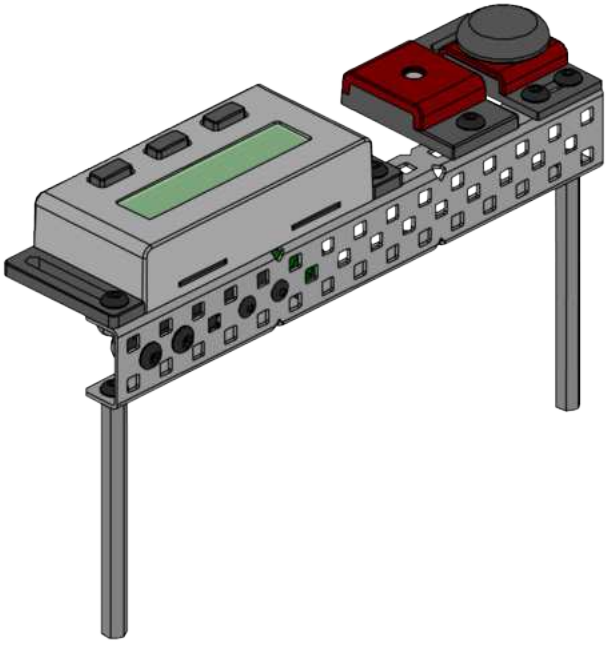




5 Arm Mount Construction *(continued)*

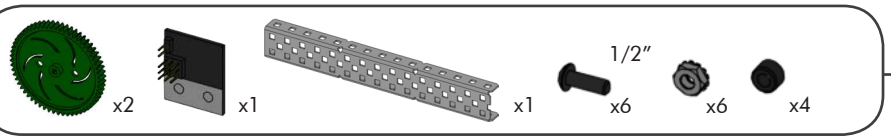


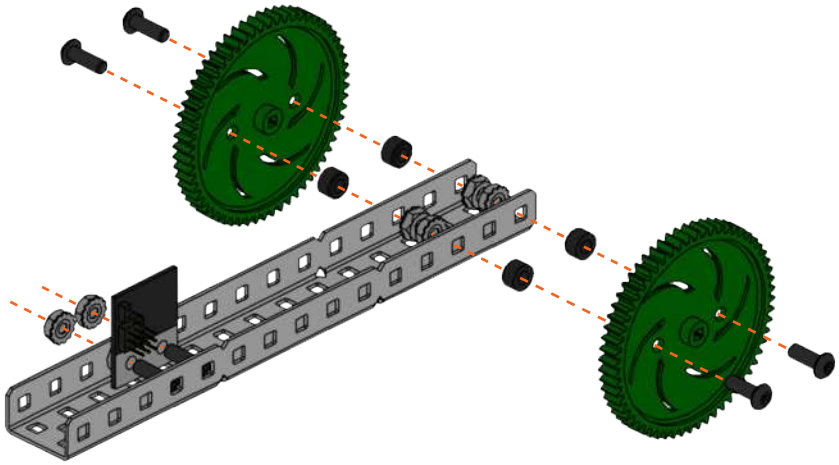


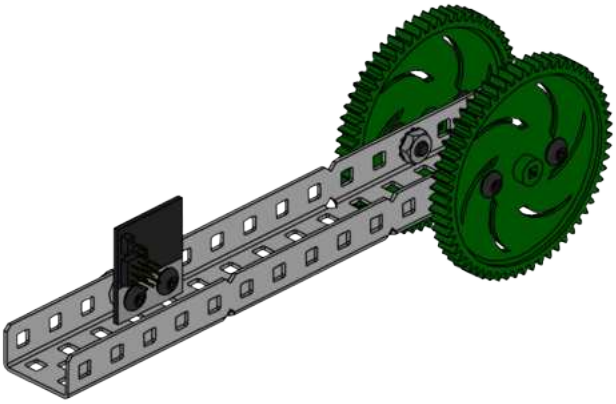


SQUAREBOT 4.0 BUILDING INSTRUCTIONS

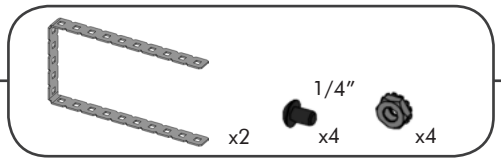
6 Arm Assembly

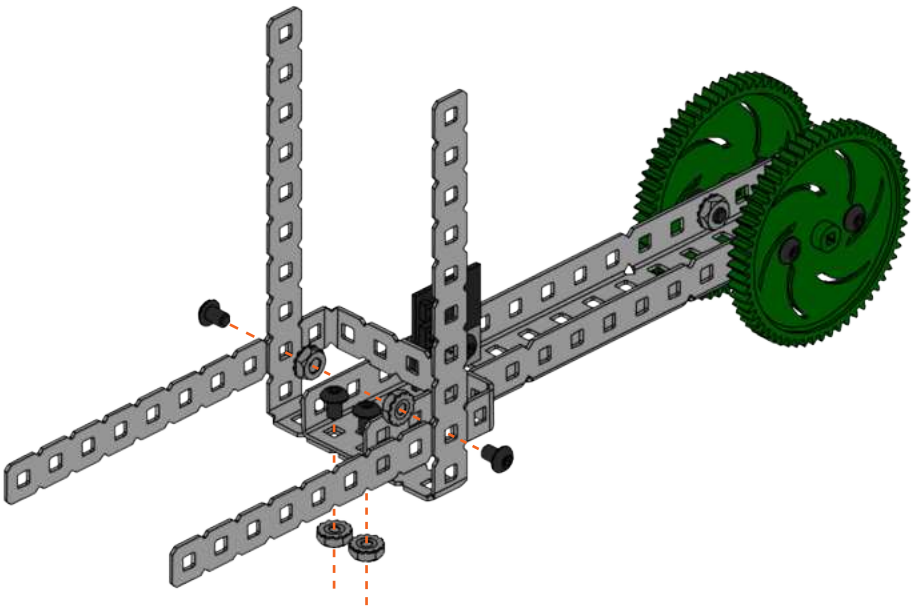


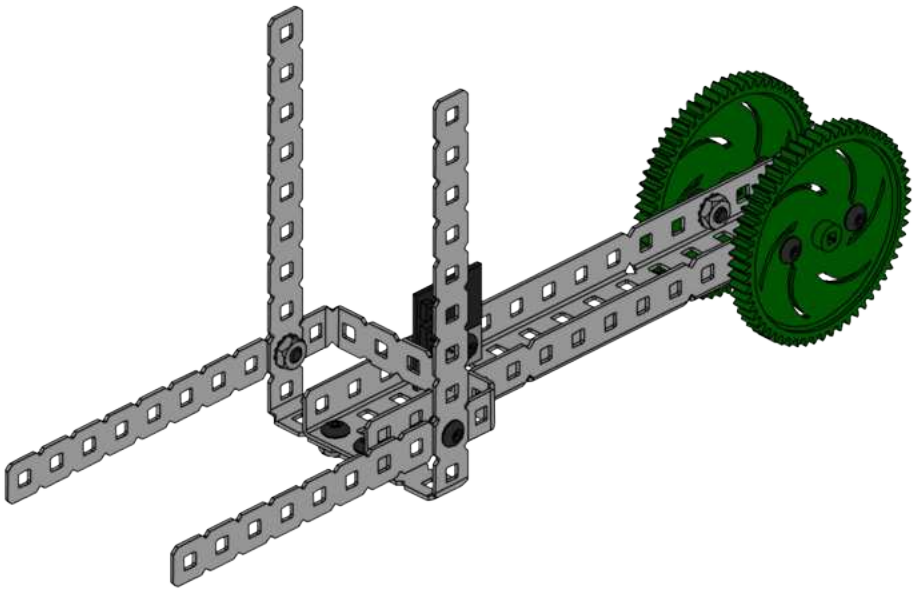




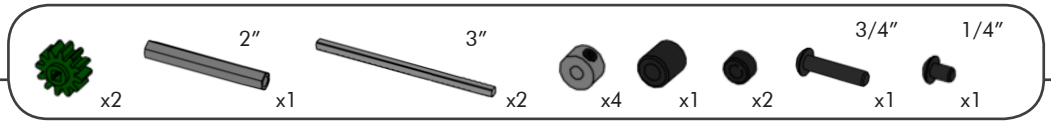
6 Arm Assembly *(continued)*

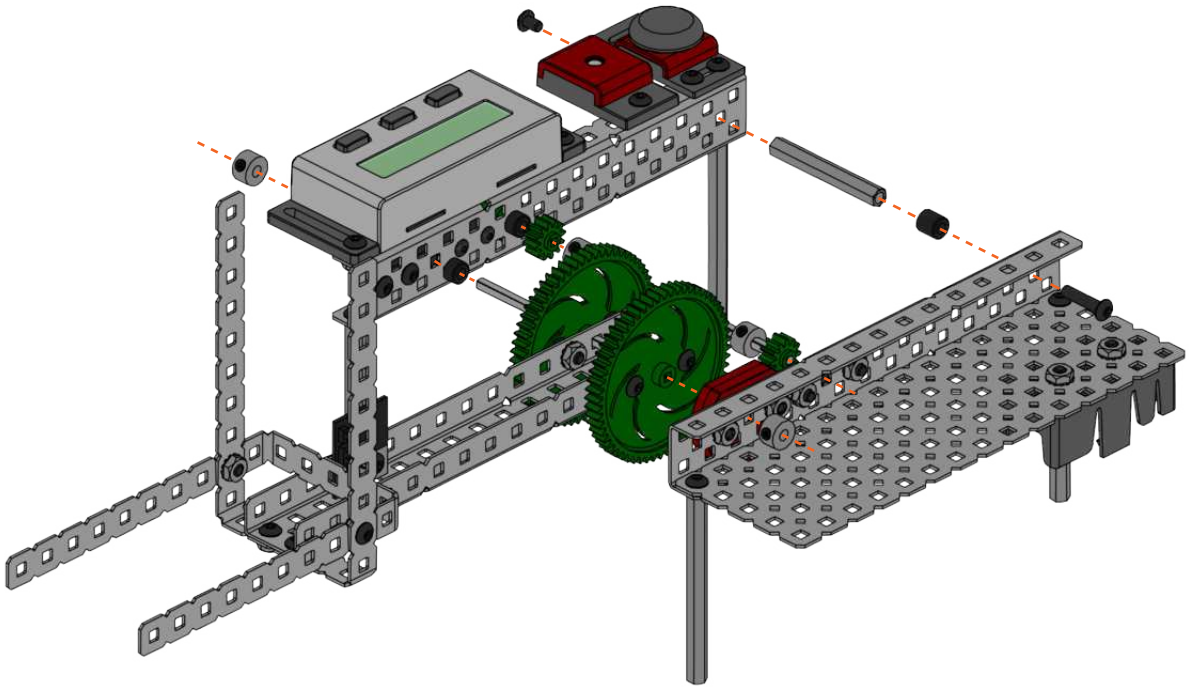


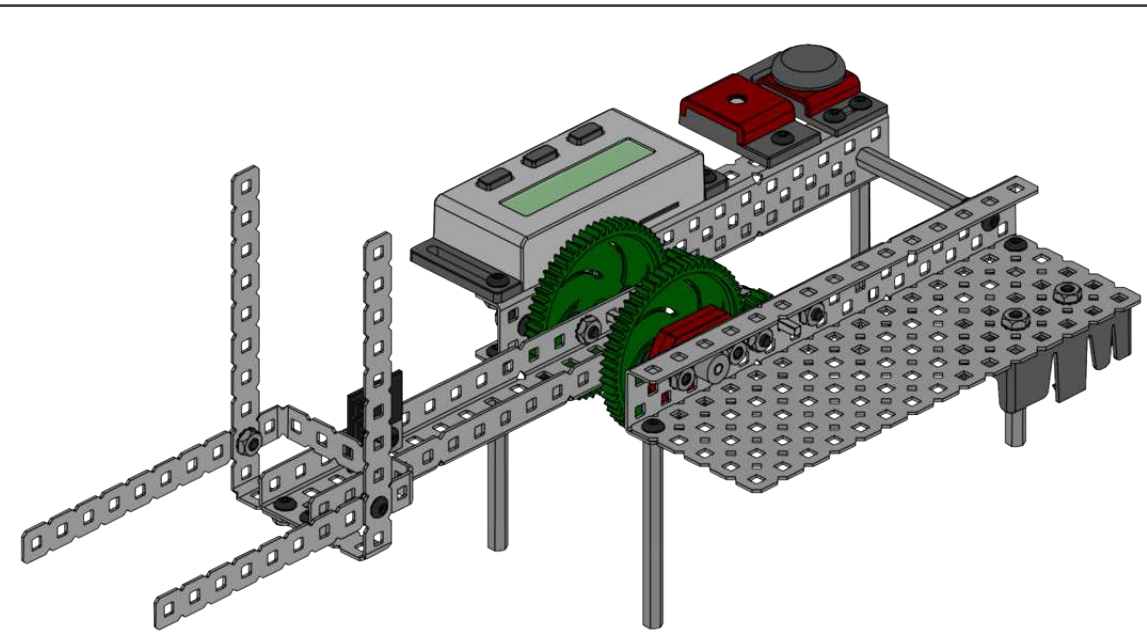




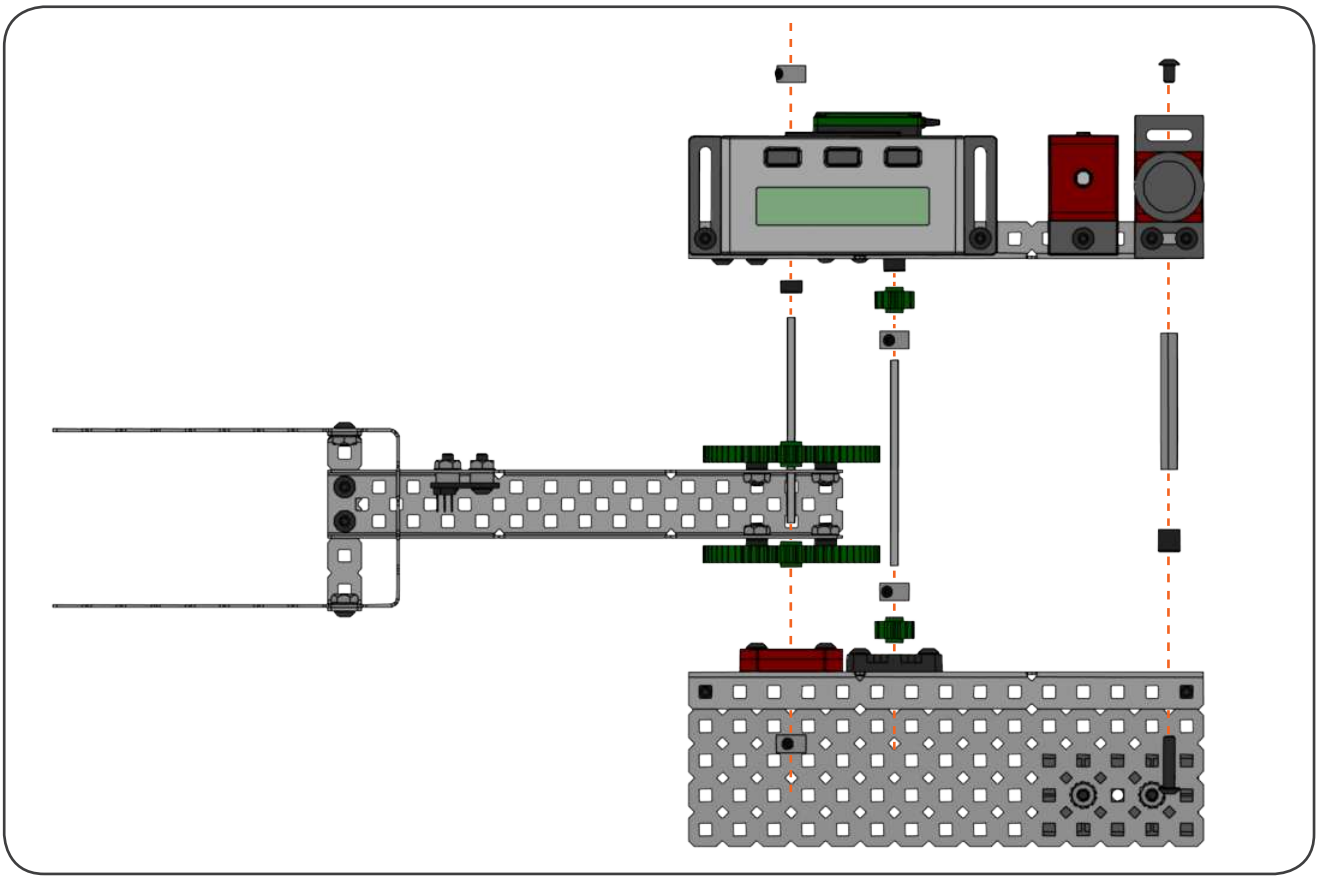
6 Arm Assembly *(continued)*

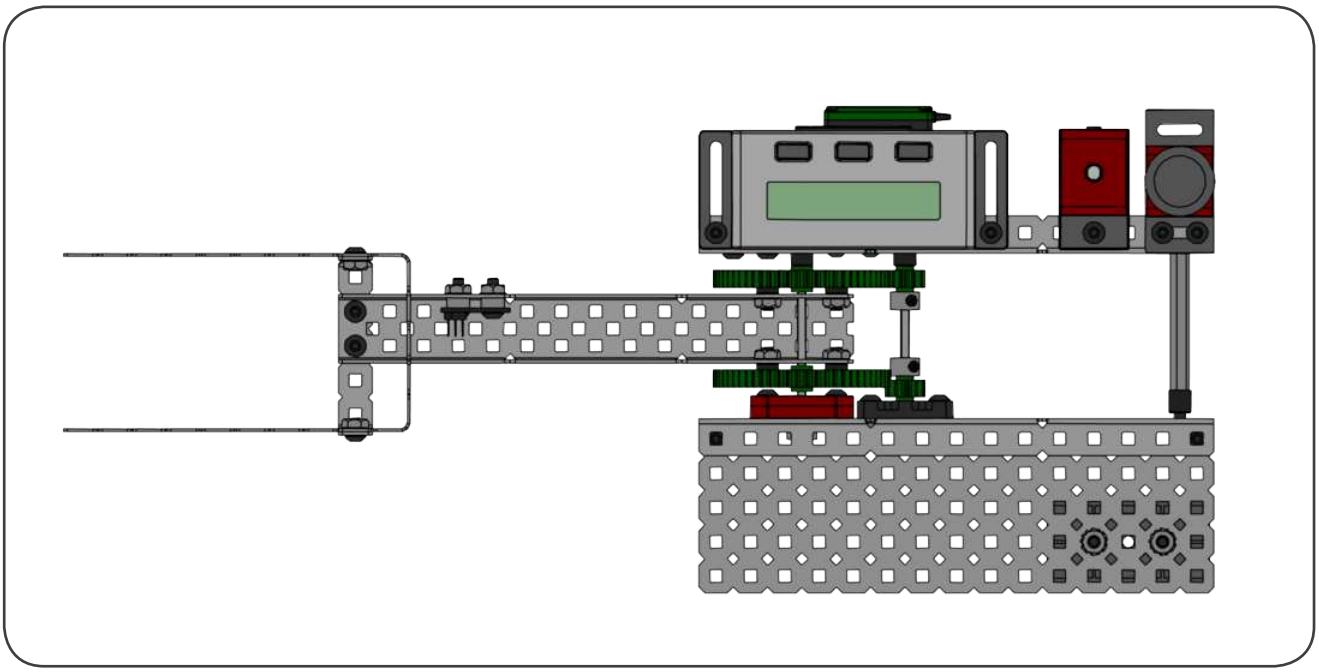




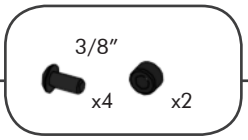


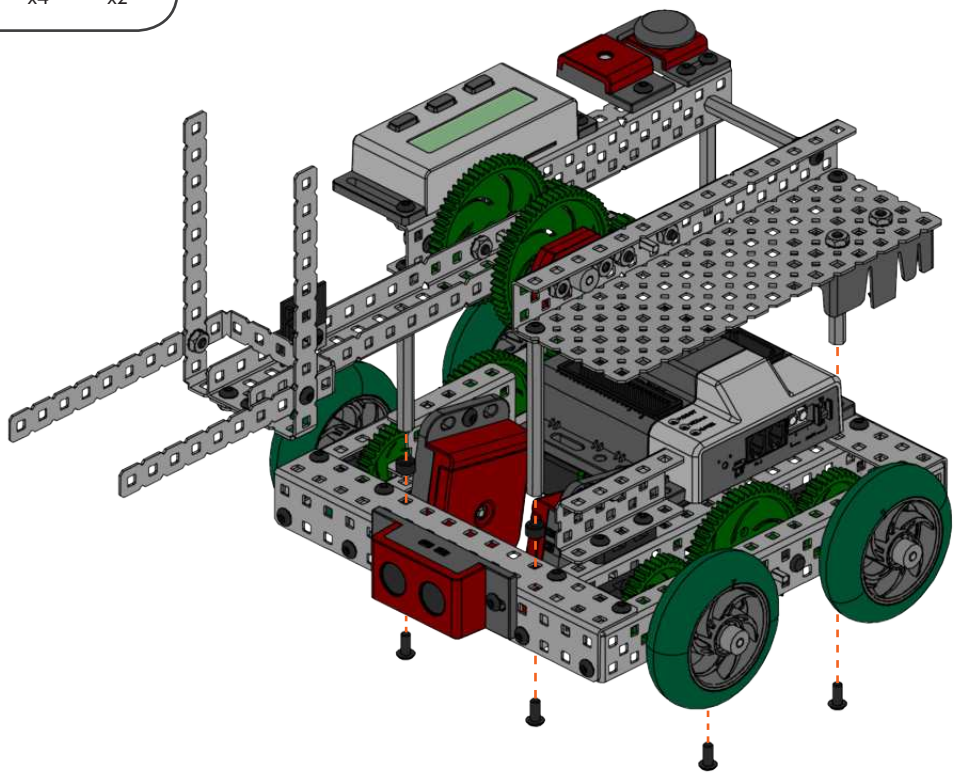
6 Arm Assembly *(continued)*

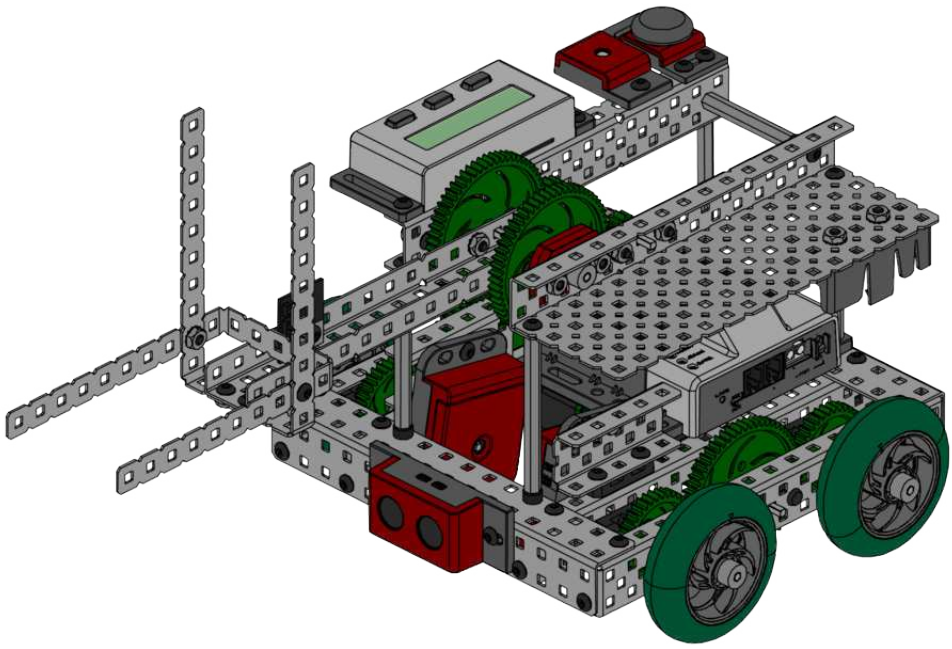




7 Attaching the Arm

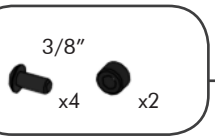


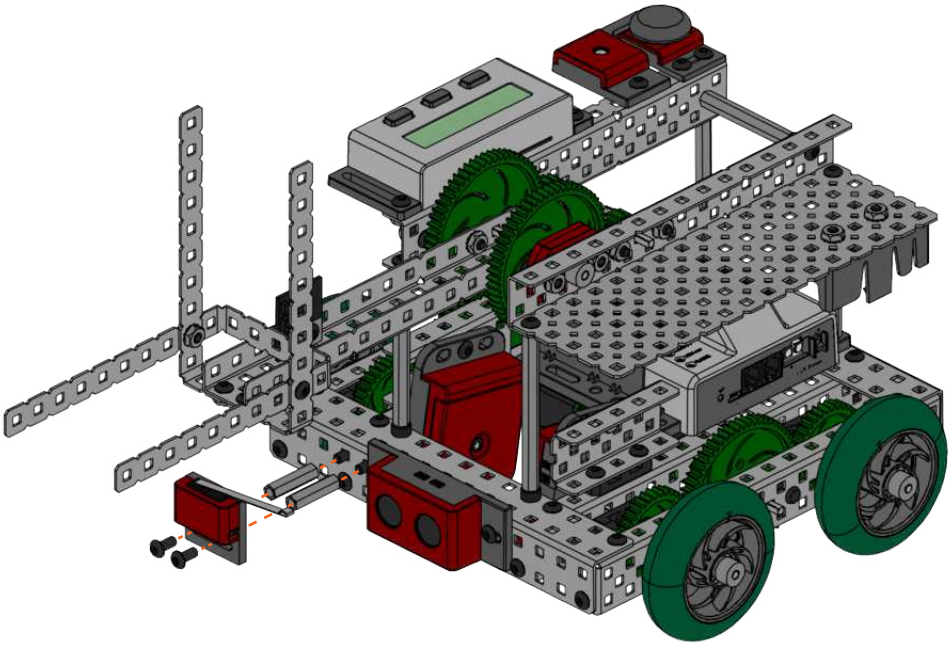


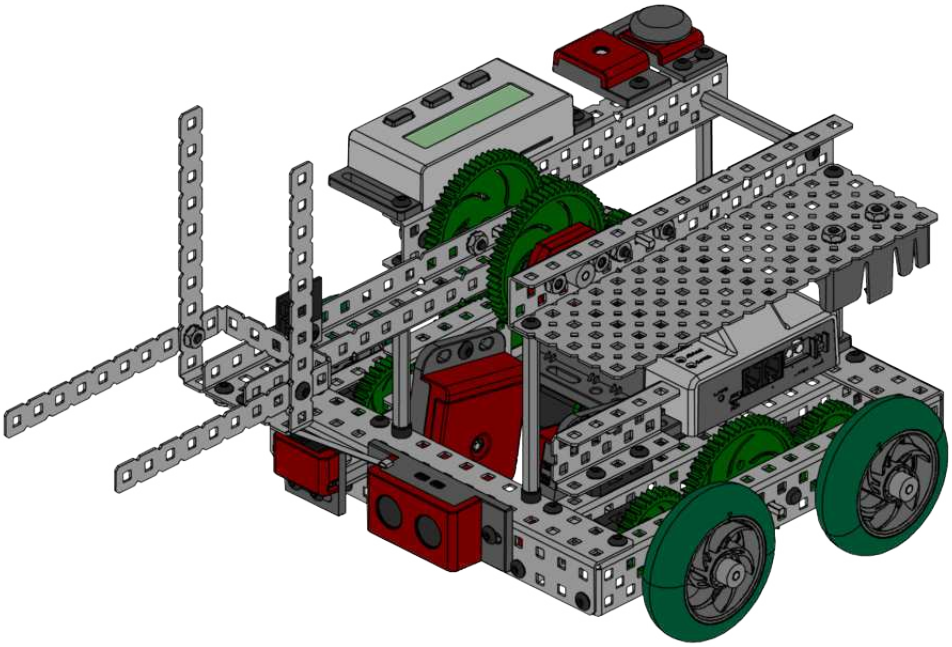


SQUAREBOT 4.0 BUILDING INSTRUCTIONS

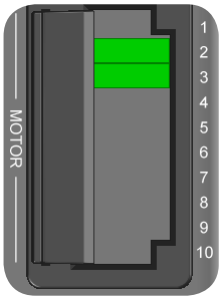
8 Attaching the Limit Switch



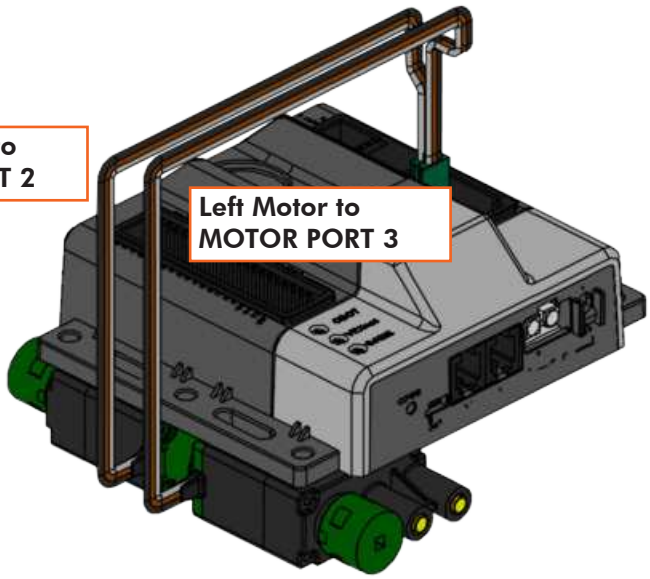




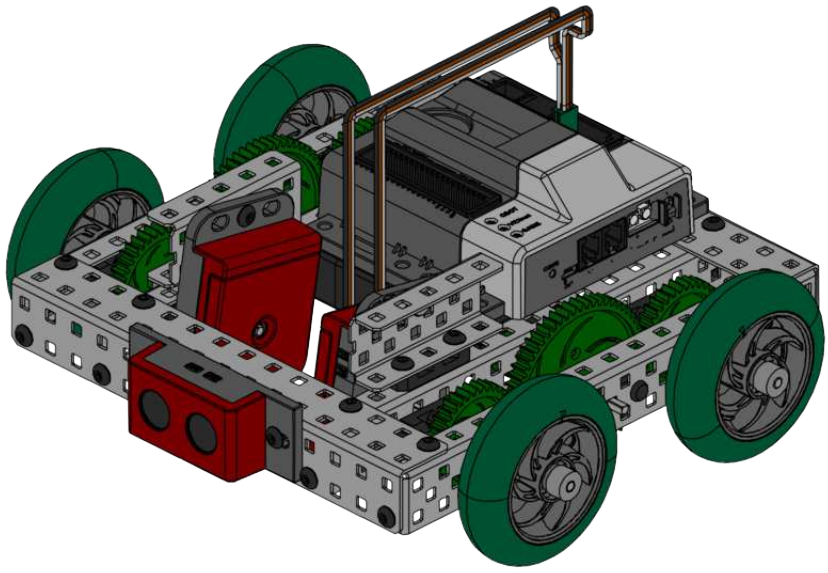
9 Wiring the Motors



Right Motor to MOTOR PORT 2



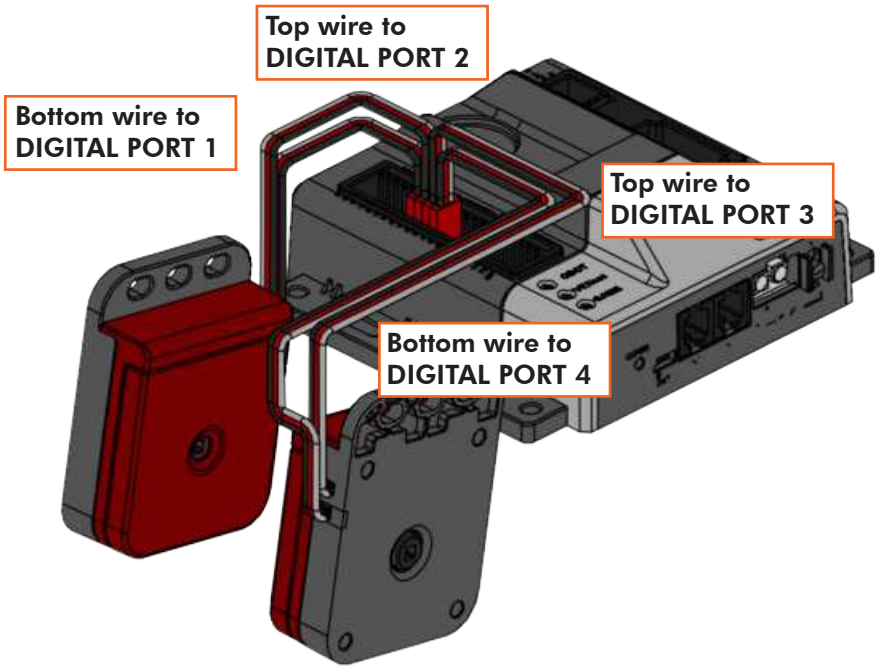
Left Motor to MOTOR PORT 3

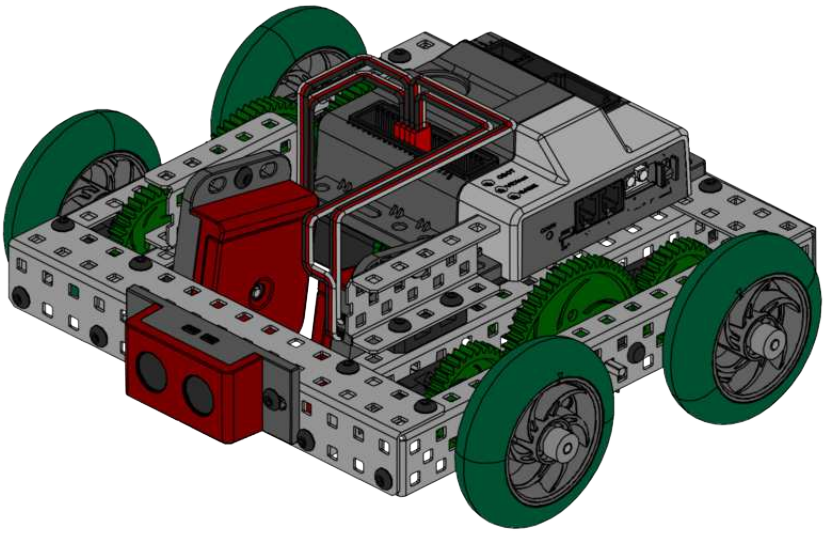


Building Tip: 2-Wire Motors

If you are using the 2-wire VEX motors, you will need to plug your motors into MOTOR Ports 1 & 10, or use the VEX Motor Controller 29's to adapt the 2-wire motors to the 3-wire MOTOR Ports (2 - 9).

10 Wiring the Encoders

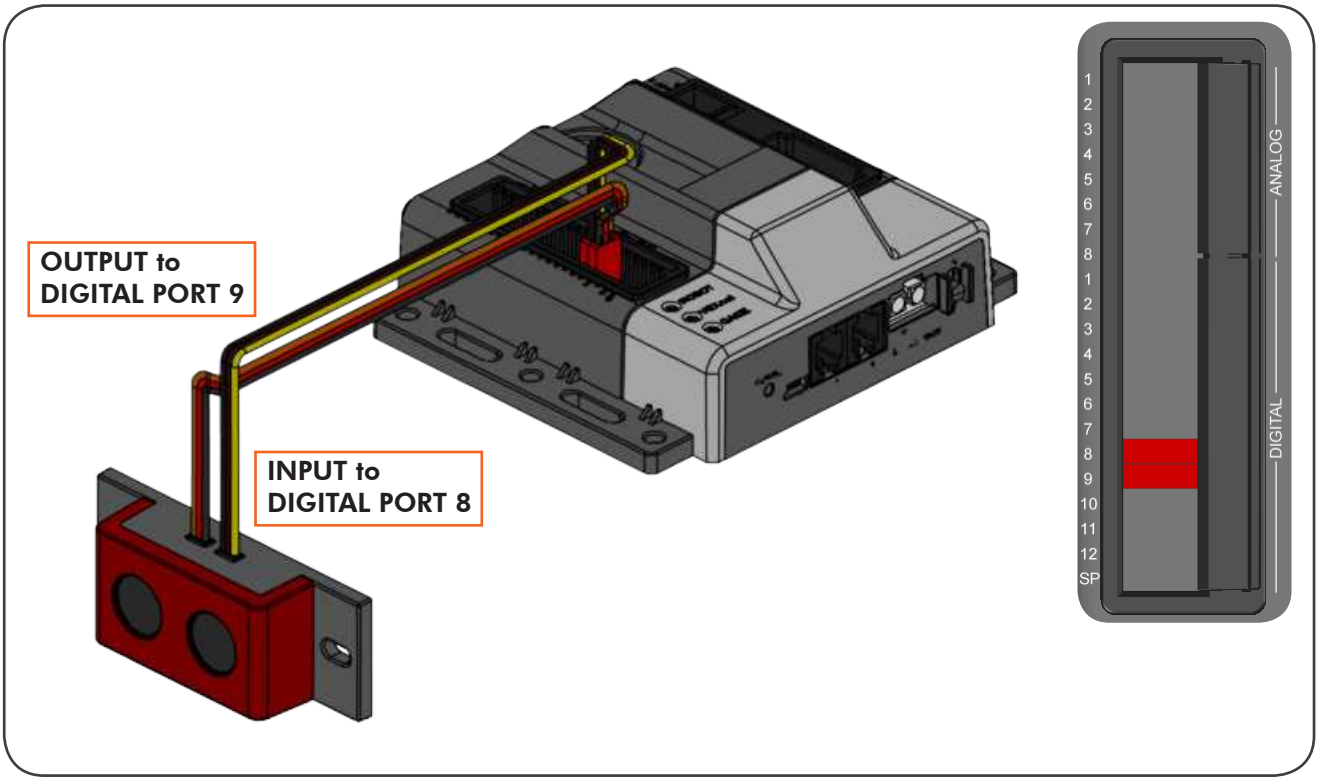


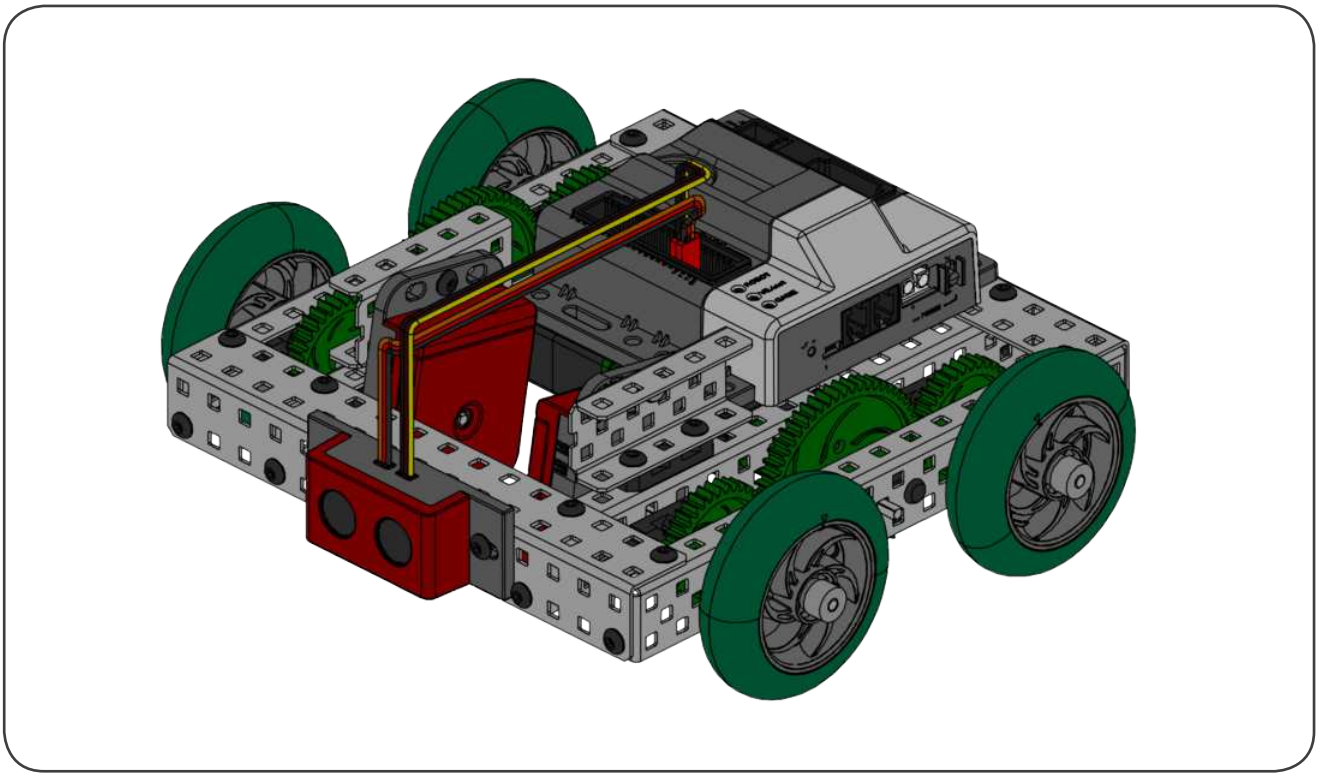


Building Tip: Encoder Wires

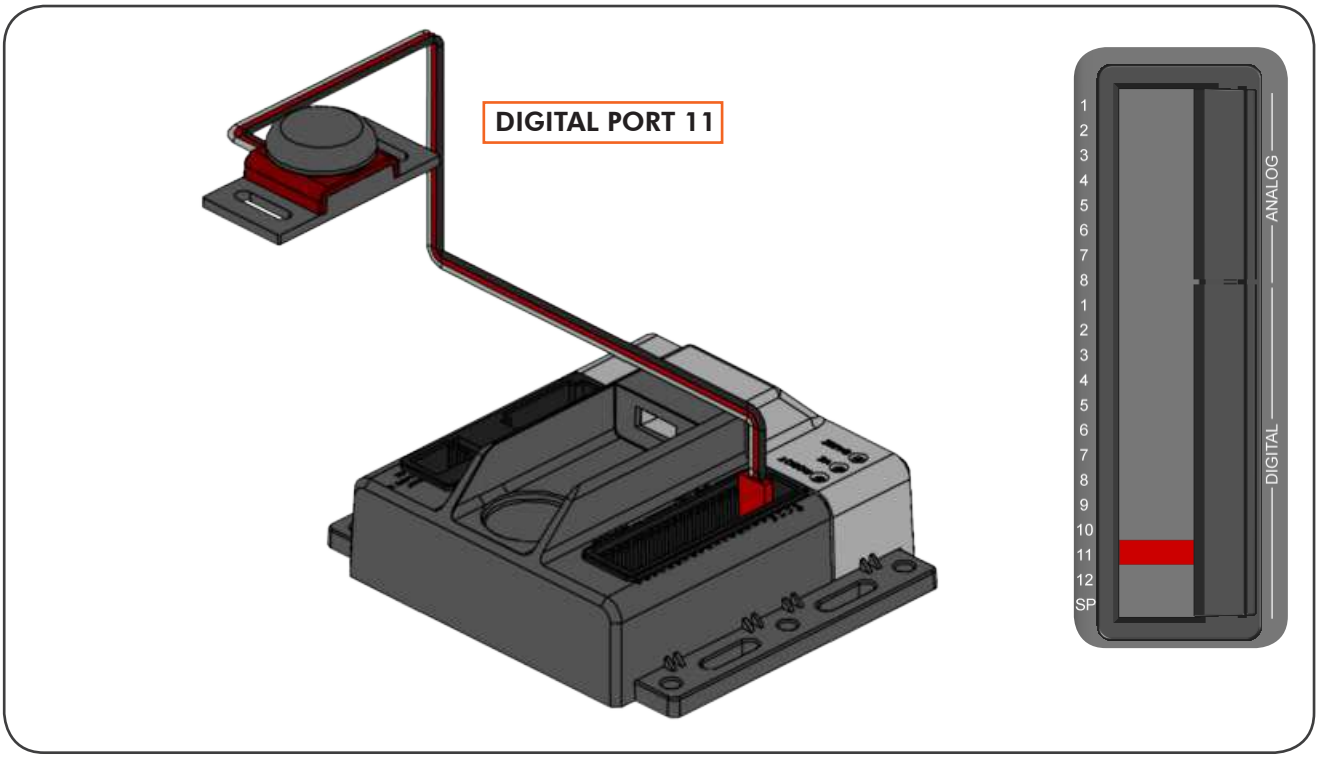
In the step above, the top encoder wire is the wire closer to the mounting holes.

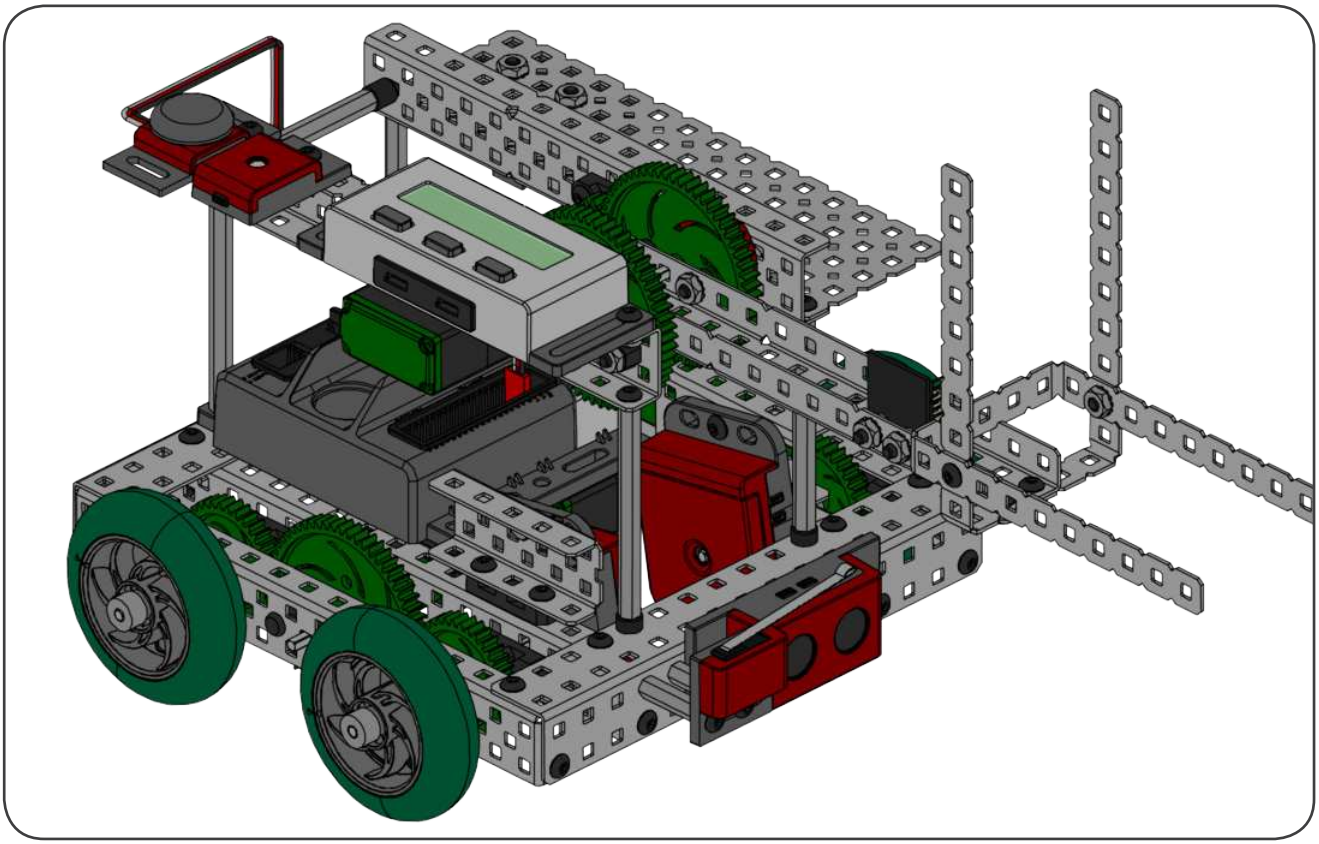
11 Wiring the Ultrasonic Rangefinder



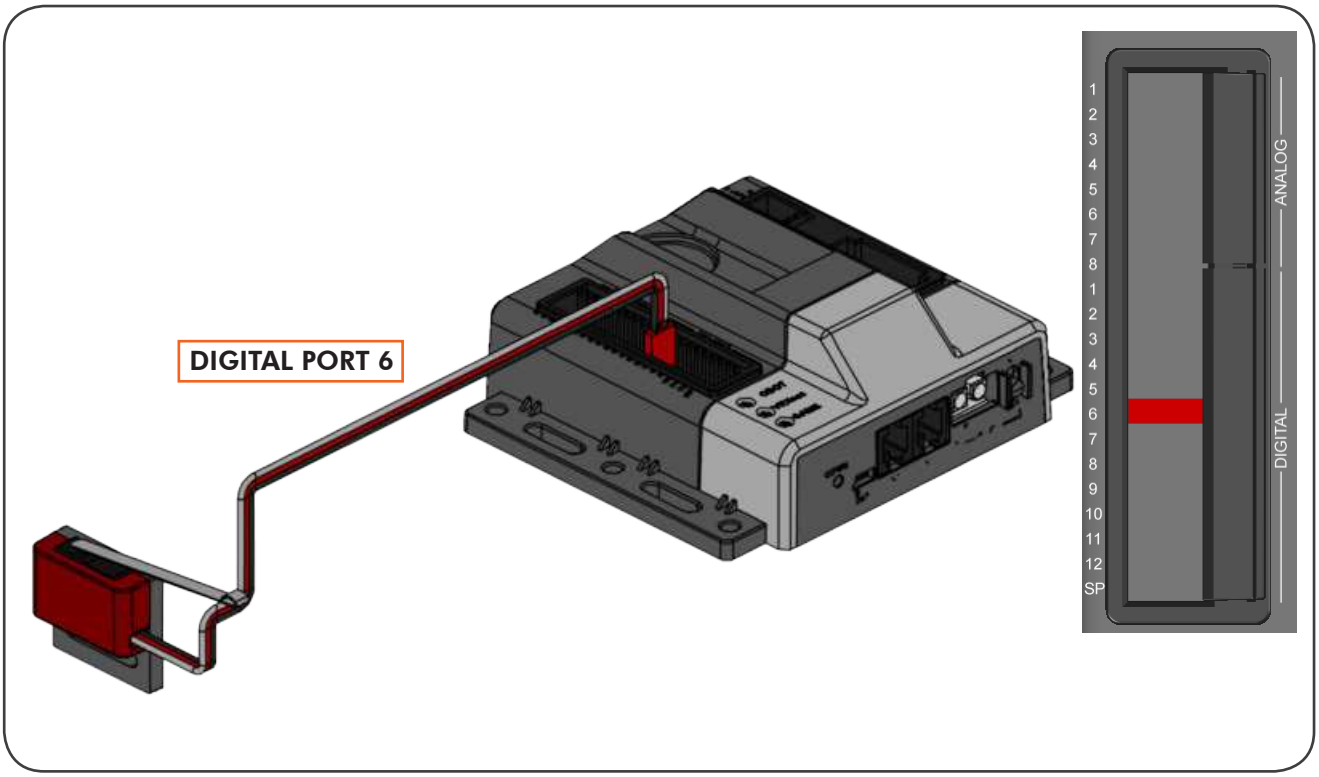


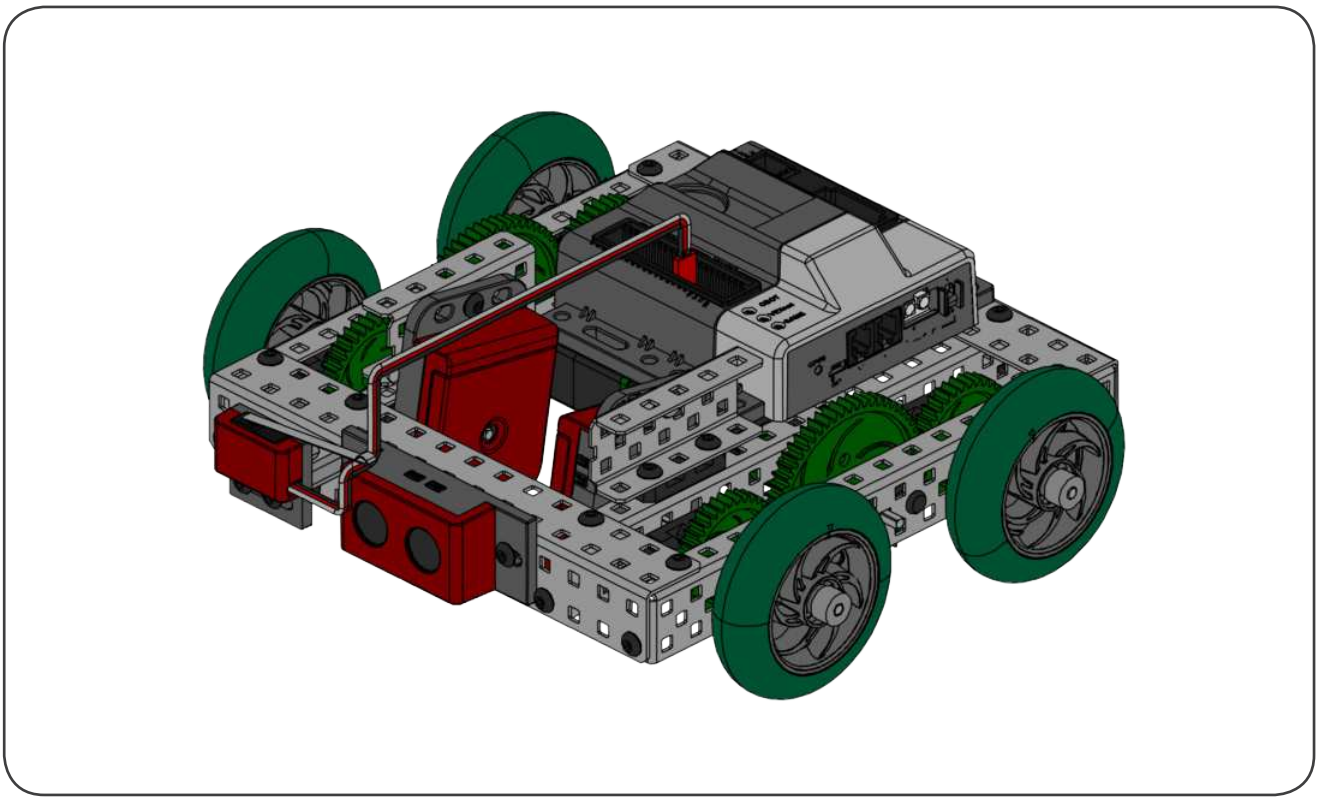
12 Wiring the Bump Switch



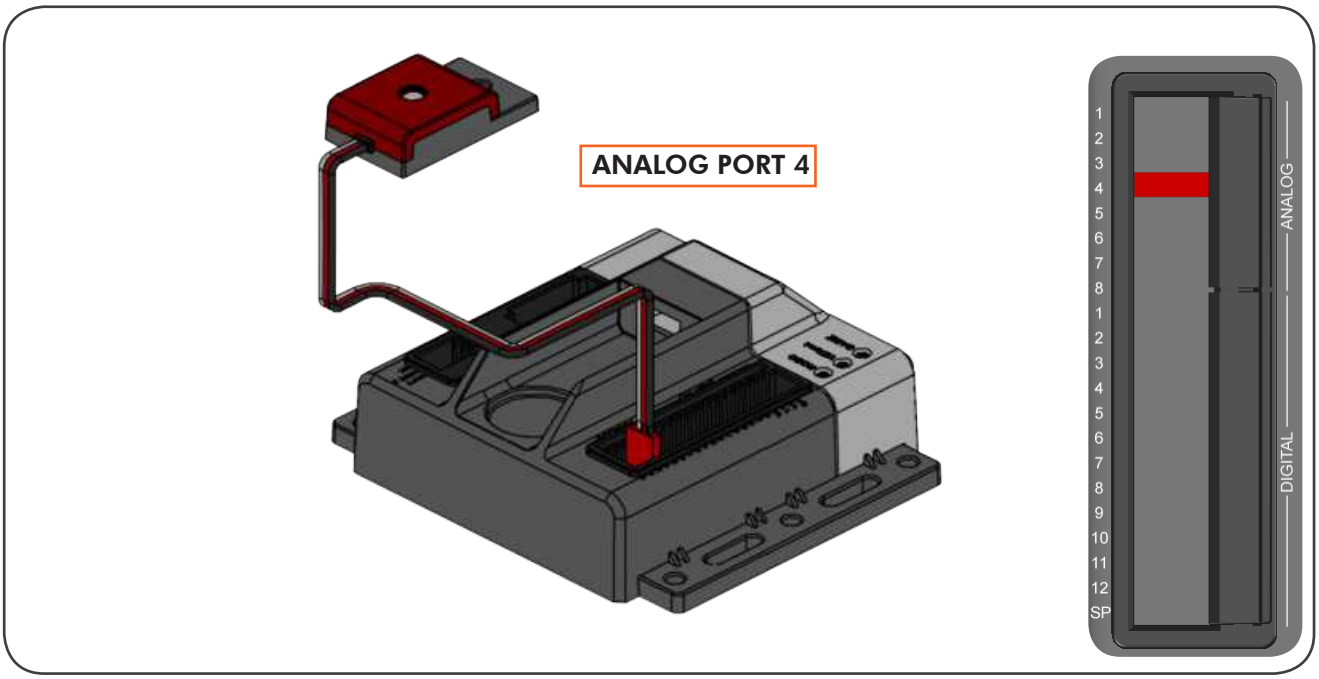


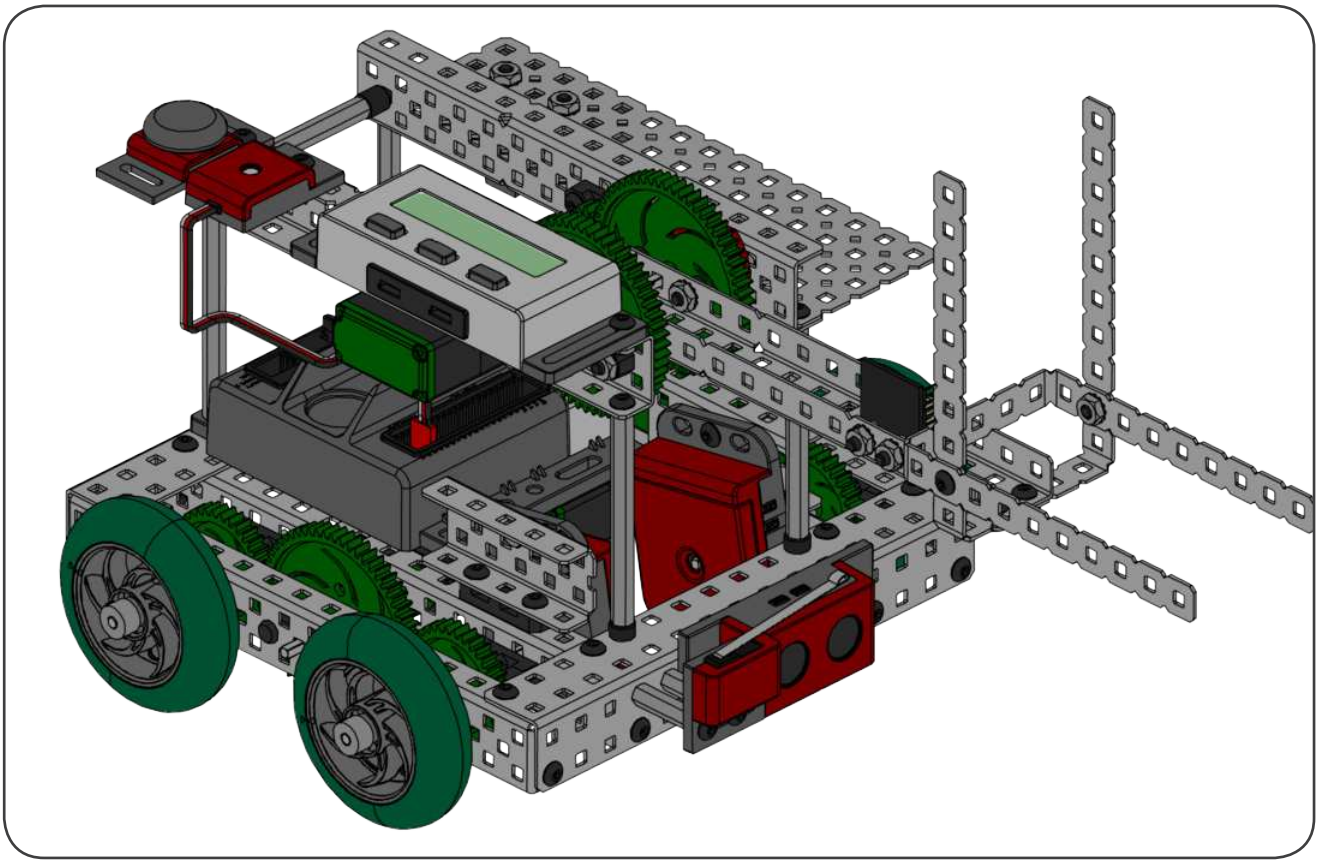
13 Wiring the Limit Switch



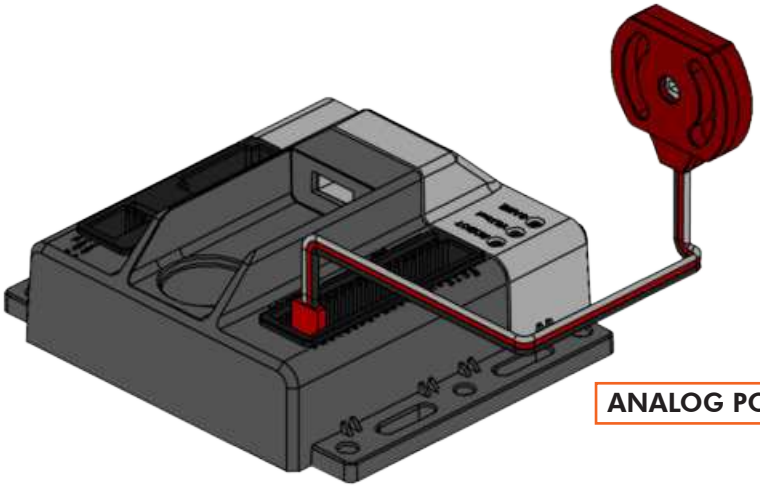


14 Wiring the Light Sensor

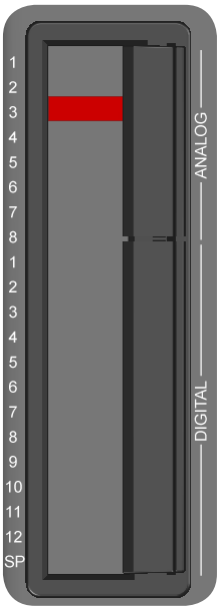


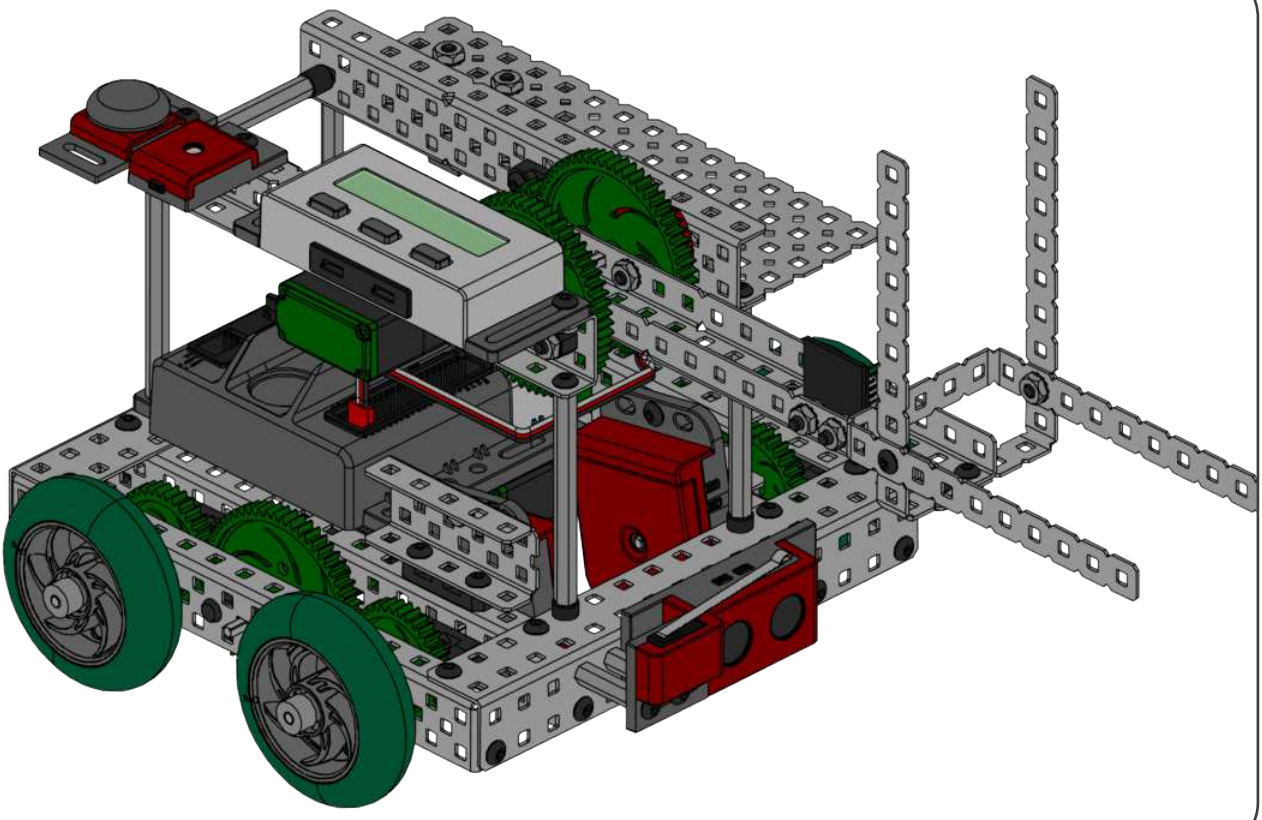


15 Wiring the Potentiometer

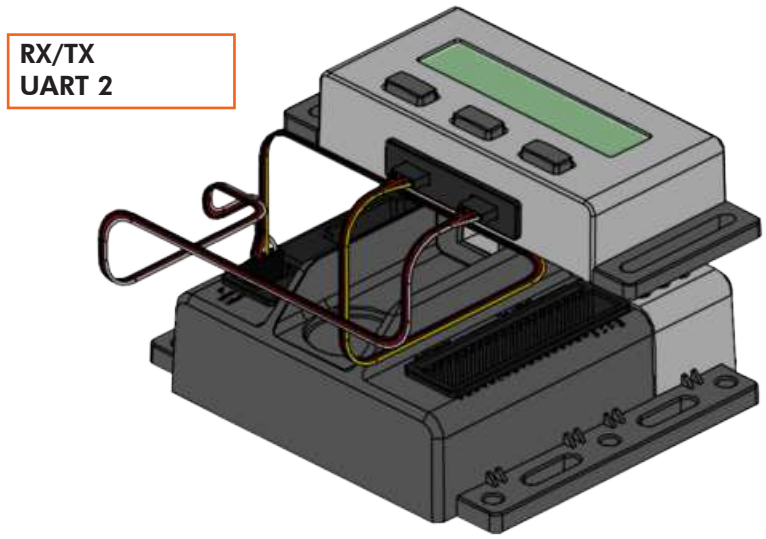


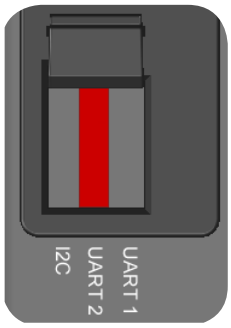
ANALOG PORT 3

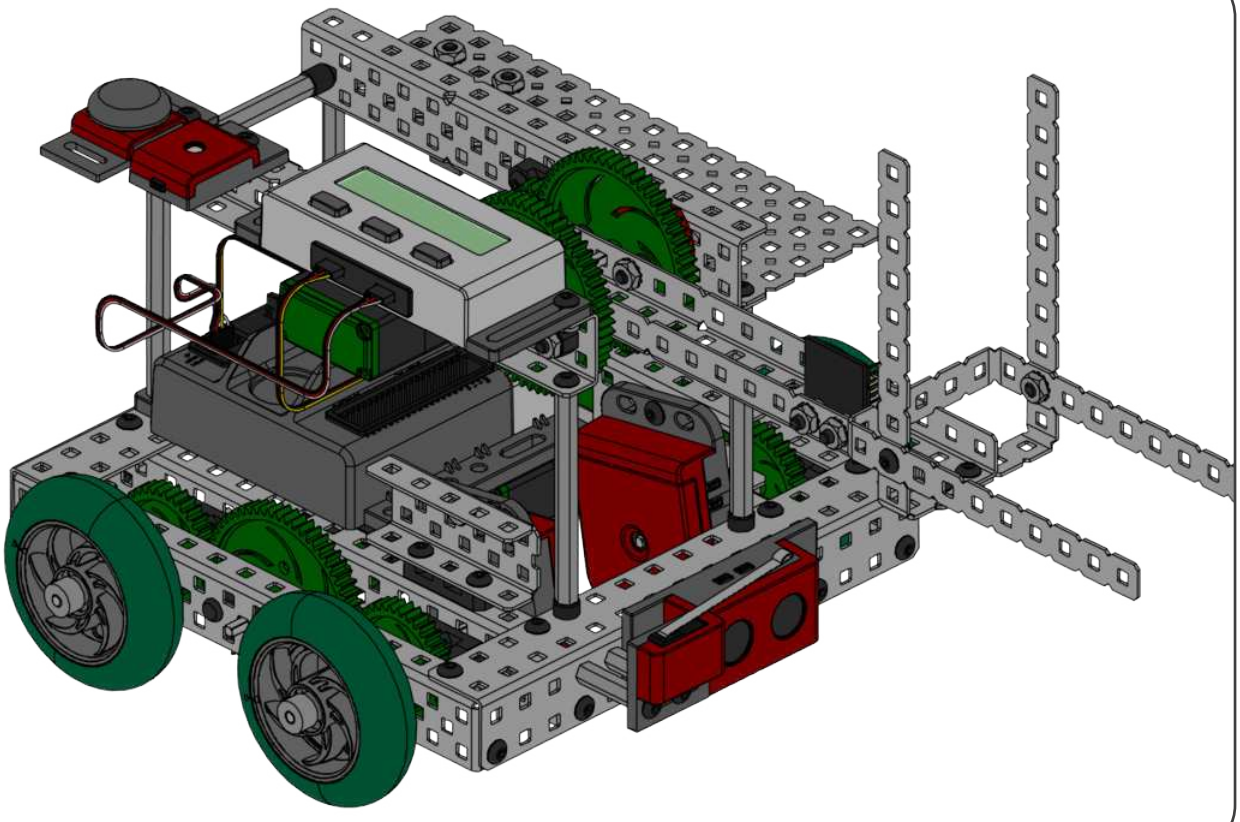




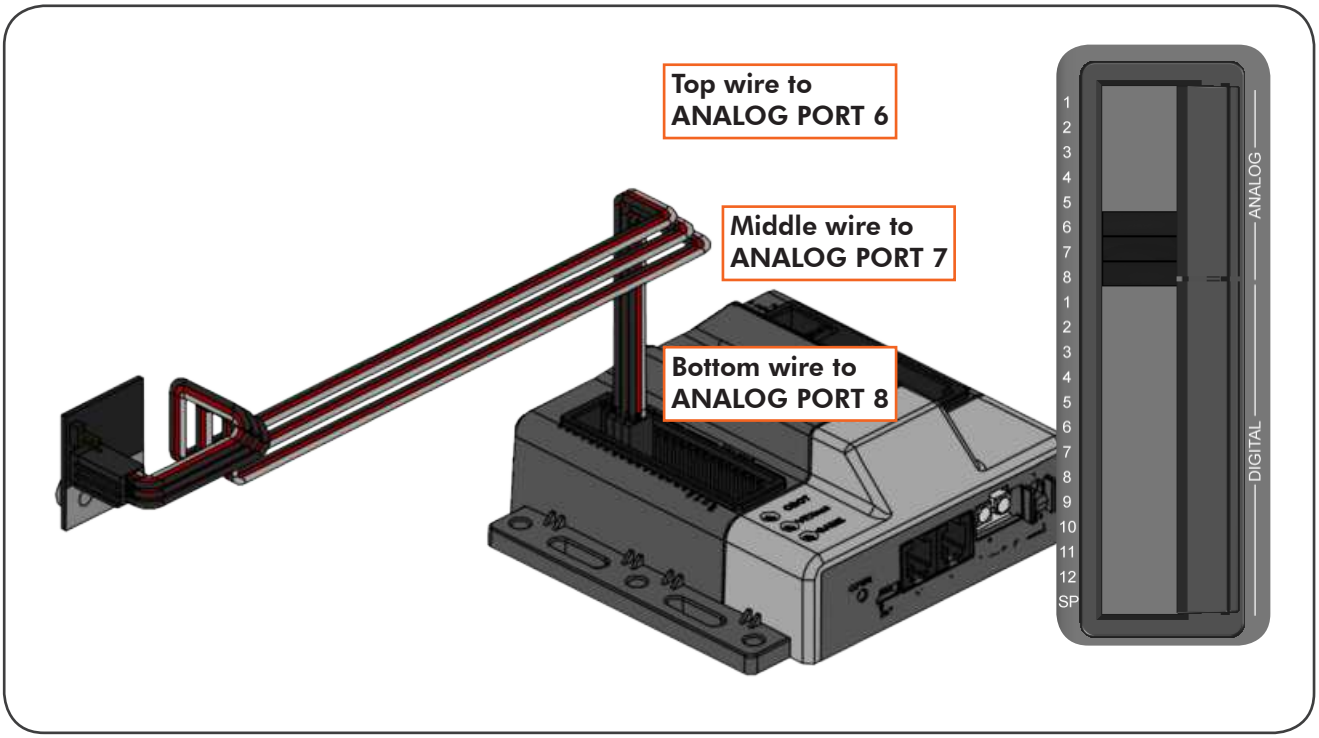
16 Wiring the VEX LCD

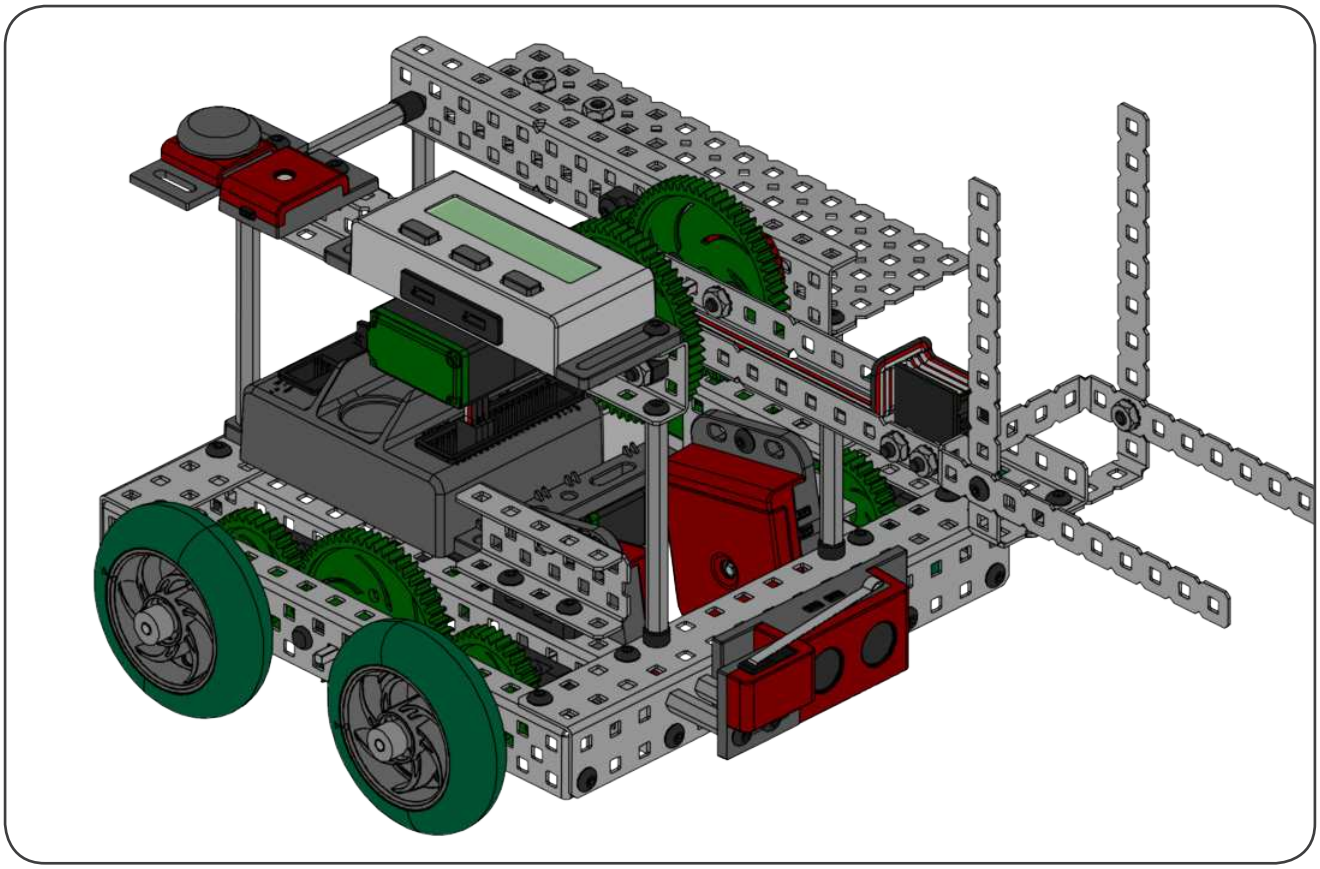




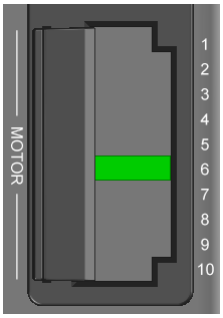


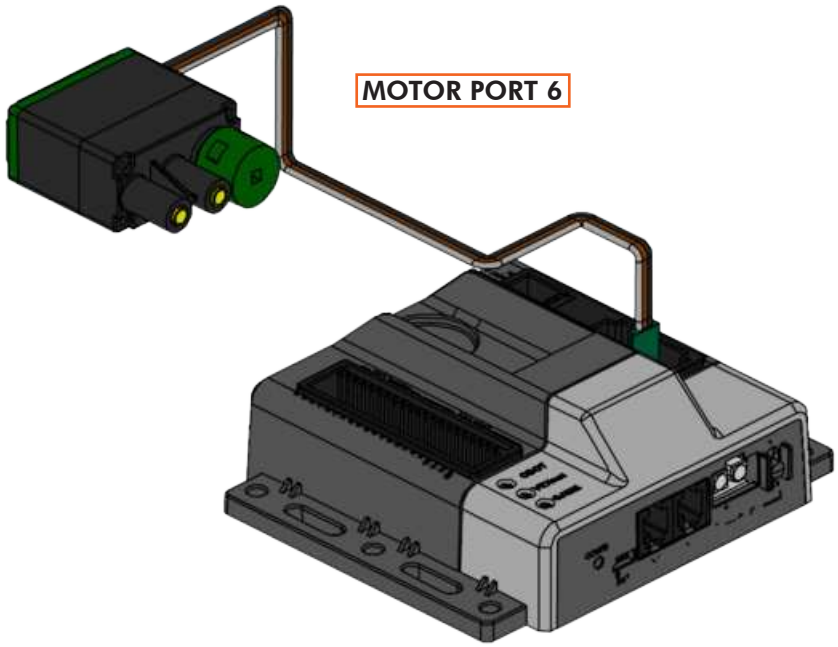
17 Wiring the Analog Accelerometer

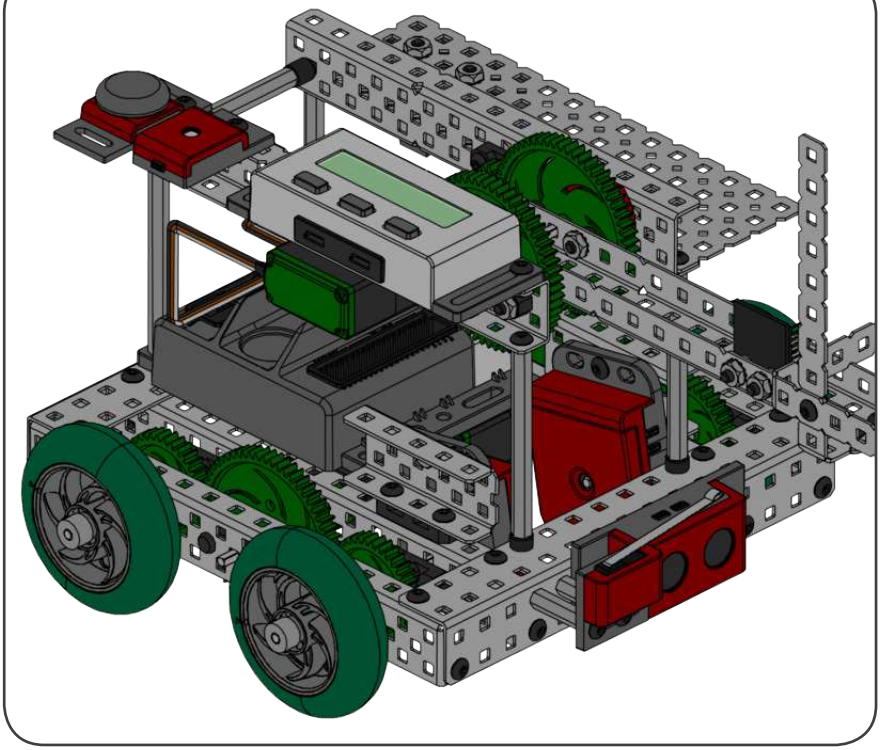




18 Wiring the Arm Motor







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