MINDS-i
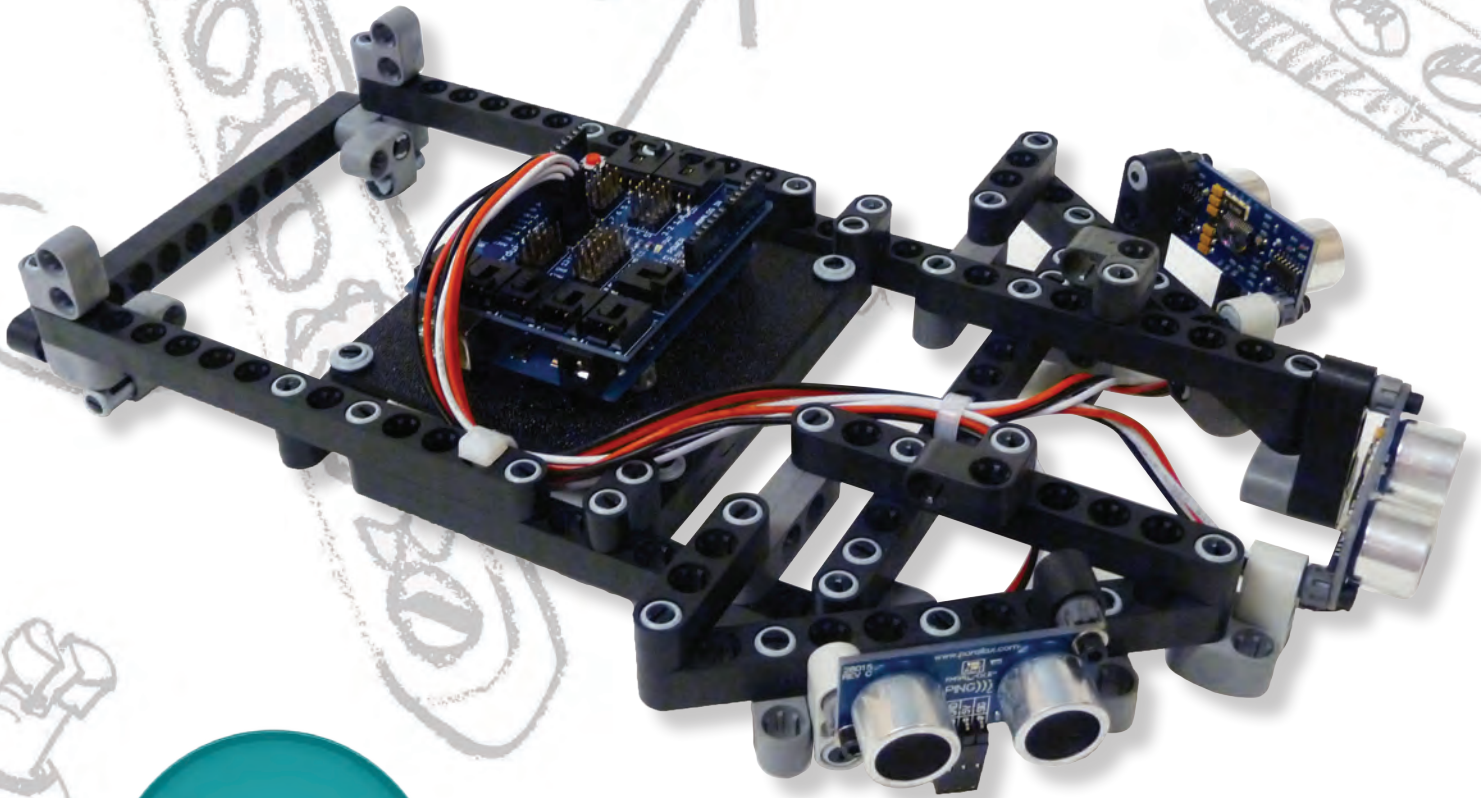
Arduino Upgrade Kit

Arduino Included

Helpful instructional videos available at: **mindsirobotics.com**

MINDS-i® PRODUCT SAFETY INFORMATION

When safety precautions are followed, your MINDS-i® system will provide years of enjoyment. Use care and good sense at all times when operating this product. Failure to use your system in a safe, sensible manner can result in injury or damage to property. You and you alone must insure that the instructions are carefully followed and all safety precautions are obeyed.

- Water can cause the electronics to short out and can cause permanent damage.
- Always turn on the transmitter before turning on the receiver.
- Fully extend the transmitter antenna before operating your vehicle.
- Before turning on your radio system, check to make sure that no one else is running on the same frequency.

- ⚠ CHOKING HAZARD: Do not allow children under age 3 or any individuals who have a tendency to place objects in their mouths to play with any part of the MINDS-i system, including, but not limited to: connectors, pieces, electronics, radio transmitters, wheels, tires. The system contains small parts which could accidentally be swallowed and cause suffocation.
- When the system is powered and/or in motion, keep fingers, face, tools, loose clothing, hair, and all other body parts away from gears, wheels, etc. Do no wear gloves while operating machinery. Even plastic parts can pinch, cut, or crush.
- The transmitter's antenna could also cause injury if played with violently or pointed towards someone's face.
- Never operate your MINDS-i® system on streets or in any areas where full-size vehicles are.
- Do not pick up your MINDS-i® system when it is in motion.
- Never charge, run or store your MINDS-i® system in a location subject to high temperatures, low temperatures or high humidity. Do not store in direct sunlight.
- To avoid electronic malfunction, do not allow the vehicle to become wet. Short circuits will produce a very strong electrical current. Should your MINDS-i® system become wet, stop using it immediately.

- ⚠ WARNING! Electrocution Hazard. Do not use the materials provided for other than its intended purpose.
- Do not put it into fire.
- Always use recommended batteries. If improper batteries are used, they may become hot, leak and may rupture.
- Do not attempt to recharge non-rechargeable batteries.
- Only batteries of the same equivalent type as recommended are to be used. Do not mix old and new batteries.
- Exhausted batteries are to be removed from the system and replaced with new ones. Recycle all used batteries.
- Do not lick batteries. If battery appears to be leaking or has a crystalline deposit on the outside, dispose of it immediately (wear gloves when handling, preferably nitrile or other non-reactive material).
- Do not run a wire between battery terminals, as wire will get very hot, can be irreparably damaged or explode.
- Make sure the batteries are installed with the correct polarity as shown. Do not disassemble your batteries. Never allow them to become hot or to burn. To avoid short-circuits, avoid getting them wet. Do not short circuit batteries.
- If liquid from inside the batteries contacts your skin or clothes, wash them with water. If leaked battery fluid gets into your eyes, flush them immediately with cool water and seek medical attention. Do not rub eyes.
- Always wear safety glasses to protect your eyes. Note that normal glasses, while usually made of impact-resistant plastic, will not afford sufficient protection from shrapnel or flying debris.
- Always wear close-toed shoes to protect your feet from heavy or sharp objects, which might be dropped.
- If you have long hair, keep it tied back or under a hat to avoid it becoming caught in moving parts.
- The MINDS-i® system contains small parts. Do not ingest. Do not insert into any orifice (e.g. nostrils, ears, etc).
- The system contains metal parts. Cutting or bending can cause parts to break; resulting in sharp edges which can cut skin.
- Battery disposal. Do not throw batteries into the trash, especially rechargeable batteries. Contact your local waste disposal office for information on battery disposal. Batteries should be stored as directed by your local hazardous materials disposal office until pickup (usually in a hard sided waterproof, non-conductive container, e.g. a plastic bucket).

⚠ WARNING! IMPORTANT! RESPONSIBLE ADULT SUPERVISION IS REQUIRED FOR CHILDREN UNDER THE AGE OF 14. THIS PRODUCT IS NOT DESIGNED FOR UNSUPERVISED USE BY CHILDREN YOUNGER THAN 14 YEARS OLD.

All pictures descriptions and specifications found in this instruction manual are subject to change without notice.

MINDS-i® maintains no responsibility for inadvertent errors in this manual. Visit www.mymindsi.com for the latest updates and information.

MINDS-i® is a high-performance Construction/RC/Robotics System, which is NOT intended for use on the public roads or congested areas where its operation may conflict with or disrupt pedestrian or vehicular traffic. Read all enclosed information before operating. Fully illustrated, step-by-step instructions describe adjustment, operation, and required maintenance procedures. MINDS-i® should not be operated in a crowd, or without adequate space. In an effort to continually upgrade our products, MINDS-i® reserves the right to make improvements and modifications to this system, which may not be reflected in the photographs and specifications printed on this box. PROPOSITION 65 WARNING: This product contains chemicals known to the State of California to cause cancer and/or birth defects or other reproductive harm.

Terms & Conditions: All orders placed with MINDS-i, Inc (phone, fax, mail, internet/web & email) constitute the acknowledgment and acceptance of all conditions listed below. All purchases remain the property of MINDS-i®, Inc until paid for in full. All orders shipped to a Washington State address must pay sales tax as required by the Washington State Department of Revenue. In the event that an order placed on our web-site does not calculate sales tax and the order is being shipped to a Washington State address, MINDS-i® will calculate the sales tax when the order is processed and call or email the customer with the new amount. All prices, materials, design, color, contents included with a product and product specifications are subject to change without notice.   Some product images may be shown with optional items that are sold separately. Depending on the products ordered and the destination of the order, certain shipping services may not be available. MINDS-i® will not be responsible for pricing errors and may cancel the order. Orders will not be shipped until all Credit Card information is verified and matched. All other orders (check or money order) will not be shipped until payment has been received in full. All unpaid orders will be canceled after 30 calendar days. All weights shown for products are used for shipping calculation only and may not reflect actual weight of the product.

Product Warranty: MINDS-i® warrants to the original buyer that our products are free from defects in materials and workmanship for a period of 120 days from the original date of purchase (original purchase receipt required). This warranty does not cover abuse, misuse, incorrect wiring, modifications, alterations, connector damage, wear and tear or robot competition damage. If the Product is determined to be defective within the warranty period, MINDS-i® or its authorized service provider will, at our sole option, repair or replace any defective parts free of charge, or refund the purchase price. What you must do: Return the Product in its original packaging or packaging affording equal protection, freight prepaid, with proof of purchase, to an authorized MINDS-i® service provider. You are responsible for all shipping charges. For more information, contact MINDS-i® at (509) 252-5767 or info@mymindsi.com.

Shipping Errors and Defective Products: Claims for shipping shortages, errors, or defective materials must be in writing and received by MINDS-i® within ten (10) days after receipt of shipment by buyer. Failure to make such claim within the stated period shall constitute an irrevocable acceptance of the goods and an admission that the goods fully comply with all the terms and conditions of the buyer's order.

MINDS-i® is Designed and Manufactured in the United States
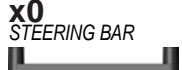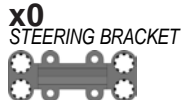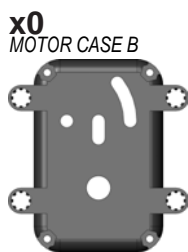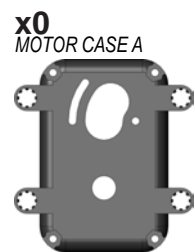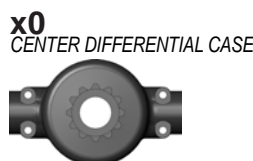**Some components are manufactured in China and the Philippines.**

Patents US 7,517,270; US 7,410,225; US 7,736,211; US 7,841,923; MX 288350; CN ZL 200680044576.1; Additional Patents Pending.
Trademarks 3,420,137 and 3,487,694
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MINDS-i, Inc
22819 East Appleway Avenue
Liberty Lake, WA 99019
USA

x0 *15-BEAM*

x0 *8-BEAM*

x0 *11-45 BEAM*

x0 *6-45 BEAM*

x4 *14-BEAM*

x0 *7-BEAM*

x0 *10-45 BEAM*

x0 *5-45 BEAM*

x3 *13-BEAM*

x0 *6-BEAM*

x0 *9-45 BEAM*

x0 *4-45 BEAM*

x0 *12-BEAM*

x0 *5-BEAM*

x0 *8-45 BEAM*

x0 *3-45 BEAM*

x3 *11-BEAM*

x5 *4-BEAM*

x0 *7-45 BEAM*

x3 *2-45 BEAM*

x0 *10-BEAM*

x0 *3-BEAM*

x8 *3-LOCK*

x38 *2-LOCK*

x0 *1.5-LOCK*

x2 *9-BEAM*

x2 *2-BEAM*

x2 *3-ROTATE*

x4 *2-ROTATE*

x4 *PANEL-LOCK*

x0 *SUPPORT ARM*

x20 *TRANSITION*

x2 *DUAL TRANSITION*

x0 *AXLE HOUSING*

x0 *CENTER DIFFERENTIAL CASE*

x0 *MOTOR CASE A*

x0 *MOTOR CASE B*

x0 *8-DRIVELINE*

x0 *4-DRIVELINE*

x0 *BATTERY CAP*

x0 *DIFFERENTIAL CASE*

x0 *7-DRIVELINE*

x0 *3-DRIVELINE*

x0 *LEAF SPRING*

x0 *ANTENNA MOUNT*

x0 *6-DRIVELINE*

x0 *2-DRIVELINE*

x0 *STEERING BRACKET*

x0 *STEERING PLATE*

x0 *5-DRIVELINE*

x0 *1-DRIVELINE*

x0 *STEERING BAR*

x0 *SERVO MOUNT*

x0 *REAR WHEEL HUB*

x0 *FRONT WHEEL HUB*

x0 *FRONT WHEEL KNUCKLE*

x0 *STEERING SERVO HORN*

x0 *LONG SERVO HORN*

x0 *ROBOT SERVO HORN*

x0 *BODY POST*

x0 *12mm WHEEL NUT*

x0 *17mm WHEEL NUT*

x0 4.8" FOUR LINK ARM

x0 3.6" FOUR LINK ARM

x0 2.4" FOUR LINK ARM

x2 2.0" THREAD COLLAR

x0 1.2" THREAD COLLAR

x0 0.4" THREAD COLLAR

x0 RING GEAR

x0 PINION GEAR

x0 DIFFERENTIAL CARRIER

x0 OUTPUT GEAR SHAFT

x0 SPIDER GEAR

x0 CARRIER SHAFT

x0 CARRIER SCREW

x0 DIFFERENTIAL SPOOL

x0 MOTOR SHAFT

x0 M5 WHEEL END SHAFT

x0 M4 WHEEL END SHAFT

x0 COTTER PIN

x0 78-T SPUR

x0 87-T SPUR

x0 15-T PINION

x0 23-T PINION

x0 90mm SHOCK

x0 HS-755MG SERVO
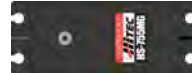
x0 HS-311 SERVO

x0 HSR-1425CR SERVO

x0 HS-485HB SERVO

x0 HS-645MG SERVO

x0 TURNTABLE PLATE
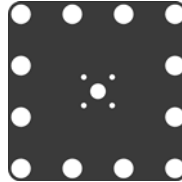
x0 LARGE SERVO PLATE

x0 SERVO PLATE

x0 7.2v 3000 mAh BATTERY

x0 BATTERY CHARGER

x0 BADLANDS 3.8" TIRE & DESPERADO WHEEL

x0 MOTOR WIRE - BLACK

x0 MOTOR WIRE - RED

x0 SPEED CONTROLLER

x0 SERVO Y-HARNESS w/REVERSER

x0 SERVO Y-HARNESS

x0 23,500 RPM MOTOR

x0 5,000 RPM MOTOR

x0 DUAL MOTOR BATTERY CABLE

x1 3/32" ALLEN WRENCH

x0 1/16" ALLEN WRENCH

x0 0.050" ALLEN WRENCH

x0 3" SERVO WHEEL

x0 RACECAR WHEEL

x0 BADLANDS 2.2" TIRE & DESPERADO WHEEL

x0 1/4" FLAT WRENCH

x0 CROSS WRENCH

x0 #1 PHILLIPS SCREWDRIVER

x0 MINDS-i TOOL

x0
#4-40 x 3/8" SCREW

x4
#4-40 NUT

x0
#4 WASHER

x0
#4-40 x 3/4" THREAD ROD

x0
ROD END BALL

x0
U-JOINT SET SCREW

x0
6x12x4mm BEARING

x4
#4-40 x 1/2" SCREW

x0
M5 WASHER

x0
#4-40 x 1" THREAD ROD

x0
SHOCK MOUNT

x0
3/16" BALL STUD

x6
#4-40 x 3/4" SCREW

x0
#4-40 x 1-1/2" THREAD ROD

x0
10x15x4mm BEARING

x0
#4-40 x 1" SCREW

x0
M5 NUT

x0
2.5x10mm DOWEL PIN

x0
3/8" BALL STUD

x0
#4-40 x 2-3/4" THREAD ROD

x0
#4-40 x 1-3/8" SCREW

x0
SERVO BUSHING

x0
#4-40 x 3-3/4" THREAD ROD

x0
M4 WASHER

x0
SERVO BUSHING SLEEVE

x0
#2-32 x 5/8" SCREW

x0
#2 WASHER

x0
23mm BALL CUP

x0
18mm BALL CUP

x0
13mm BALL CUP

x0
ROD END

x0
LARGE SERVO BUSHING

x0
M3x6mm SCREW

x20
M3 WASHER

x0
M4 NUT

x6
INTERFERENCE THREAD ADAPTER

x16
CLEARANCE THREAD ADAPTER

x0
SERVO HORN SCREW

x1
ARDUINO BASE PLATE
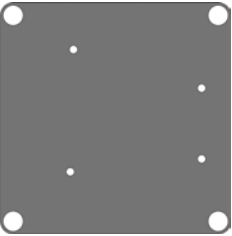
x1
ARDUINO
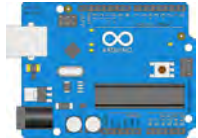
x0
IR DISTANCE SENSOR

- 6 -

x3
PING))) SENSOR
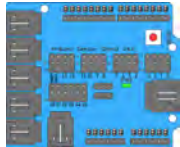
x3
3-PIN CABLE FLAT TO LATCH

x0
PUSH BUTTON

x1
SENSOR SHIELD

x0
3-PIN CABLE FLAT TO SEPARATE

x0
QTI SENSOR

x0
ARDUINO COVER
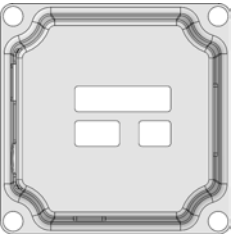
x1
USB CABLE

x0
ARDUINO BATTERY HARNESS

x2
SERVO CABLE MALE TO MALE
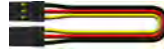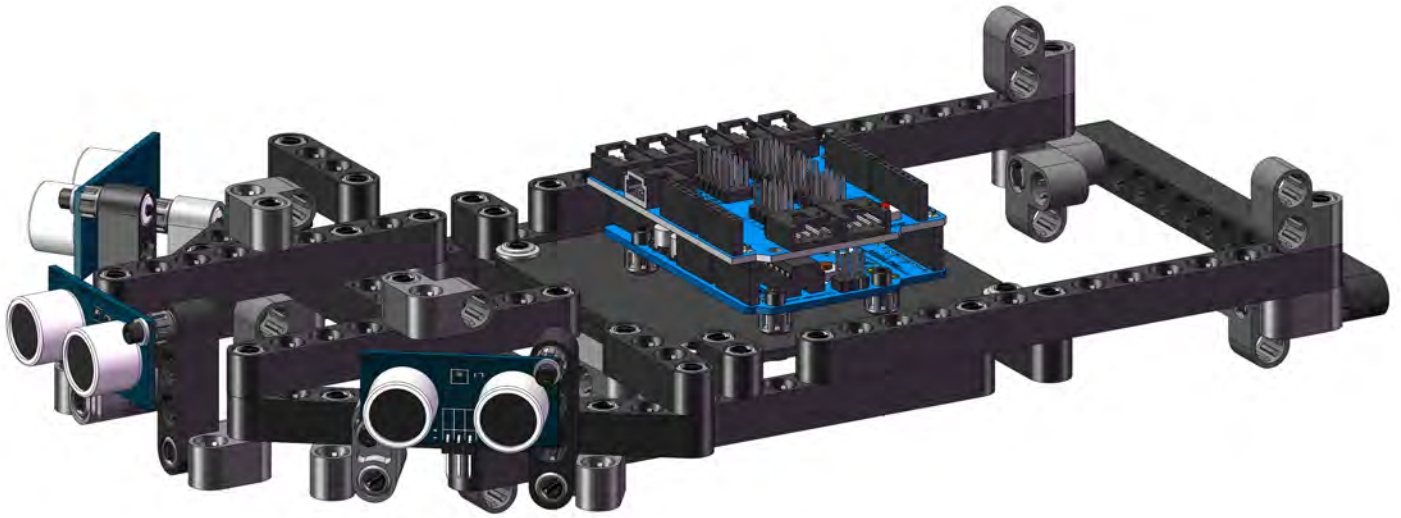
x0
SERVO CABLE MALE TO FEMALE

x0
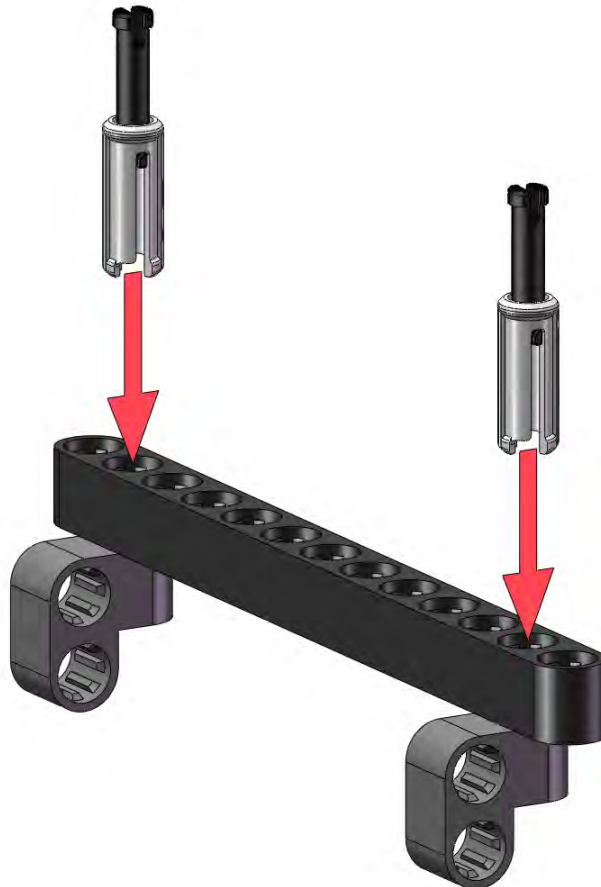5x5 IR PANEL
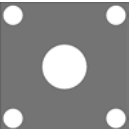
x1
USB THUMB DRIVE

x0
VOLTAGE REGULATOR

01

x1
13-BEAM

x2
TRANSITION

x2
2-LOCK

02

x2
9-BEAM

x2
DUAL TRANSITION

x4
2-LOCK

03
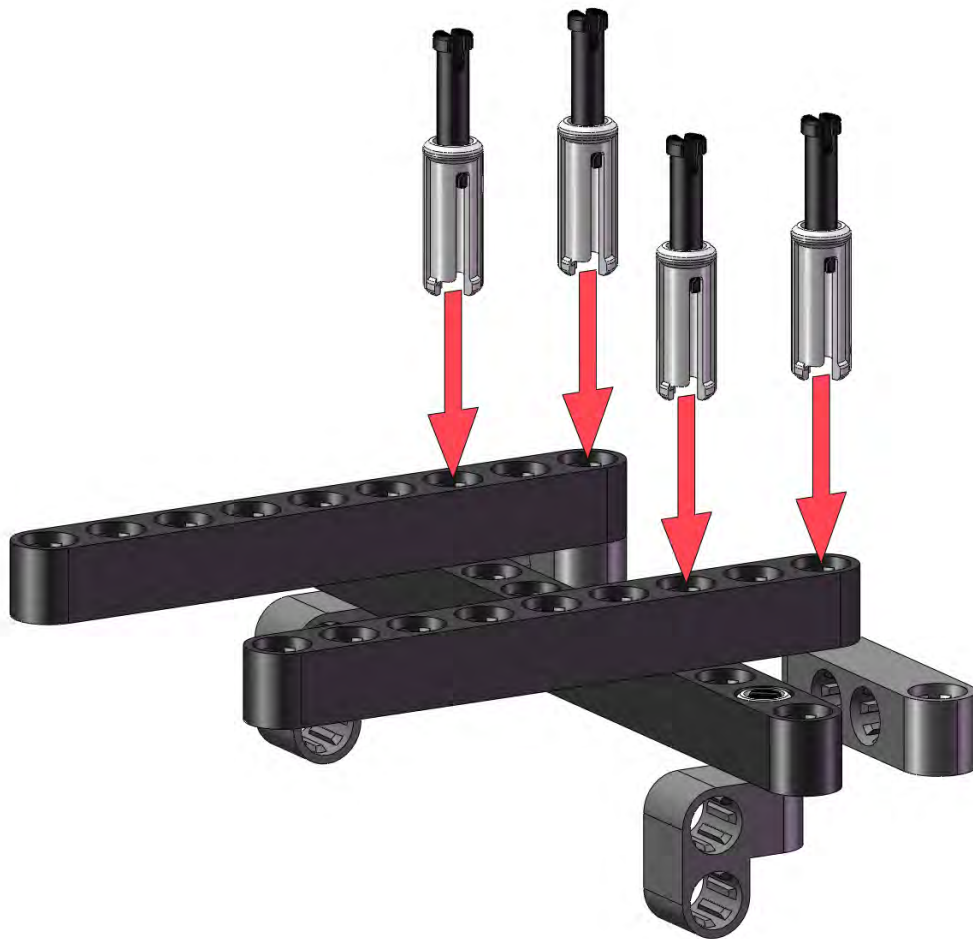
x2
14-BEAM

x2
4-BEAM

x2
3-LOCK

x2
2-LOCK
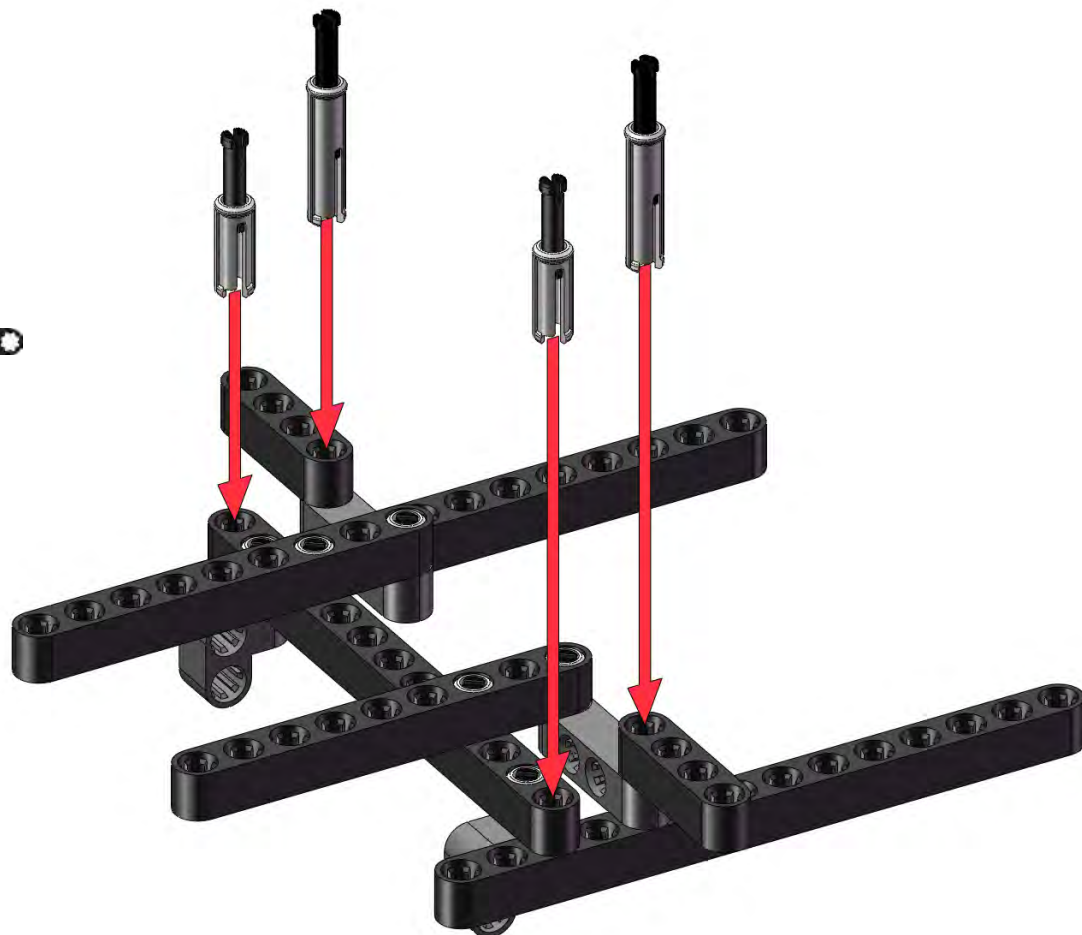
04

x2
11-BEAM

x2
TRANSITION

x2
2-LOCK

x4
2-ROTATE

05

x2
14-BEAM

x4
2-LOCK
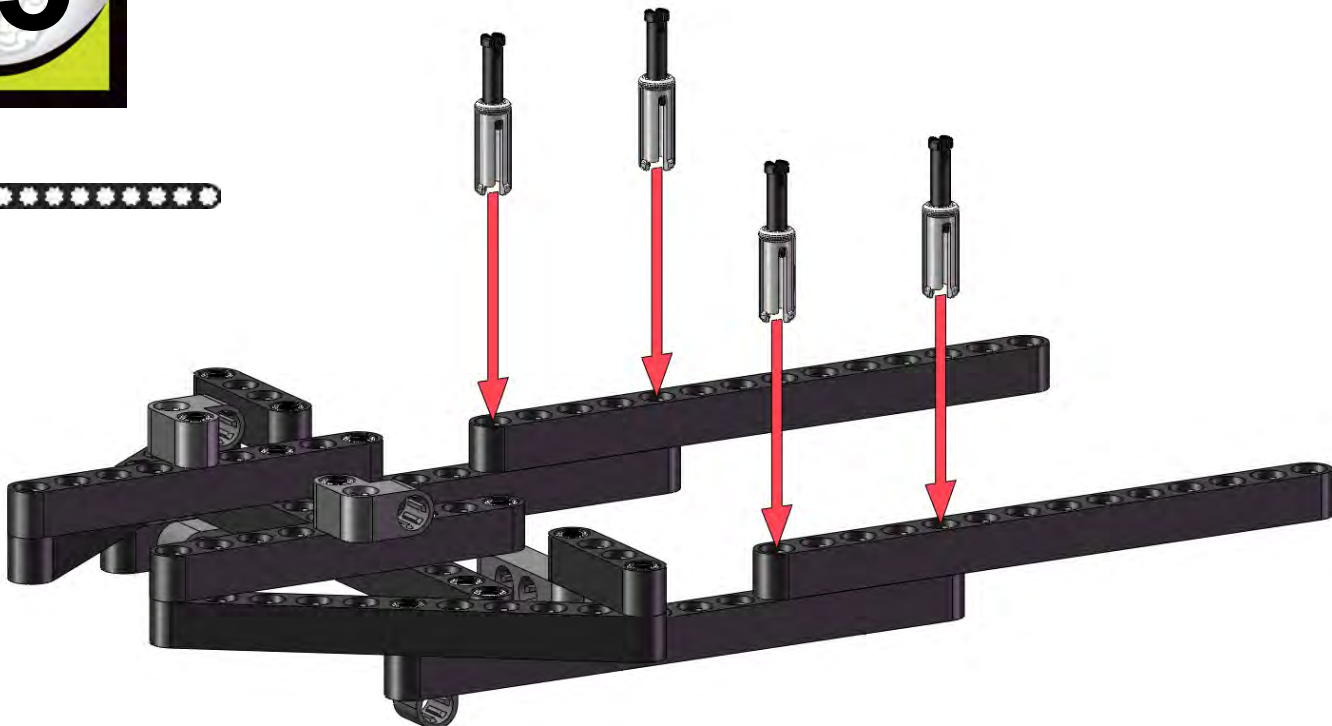
06

x1
13-BEAM

x4
TRANSITION

x2
3-LOCK
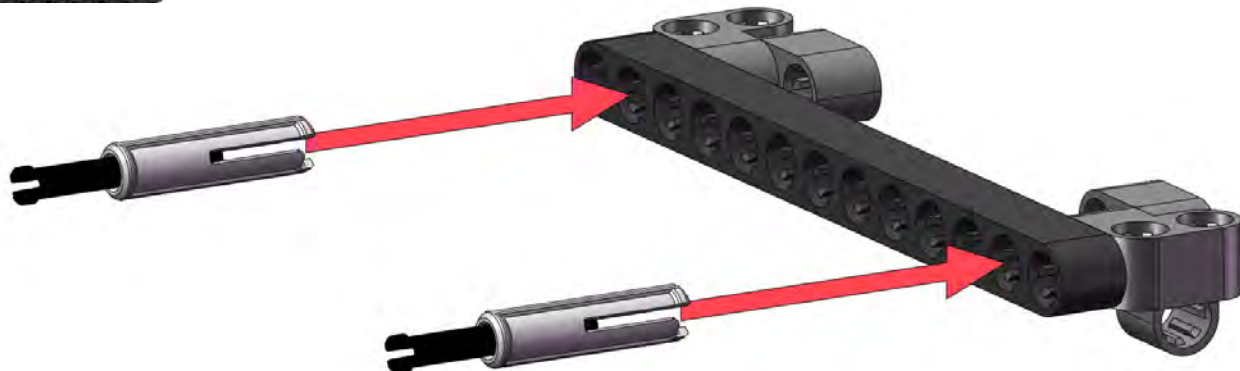
07

x2
TRANSITION

x2
3-LOCK
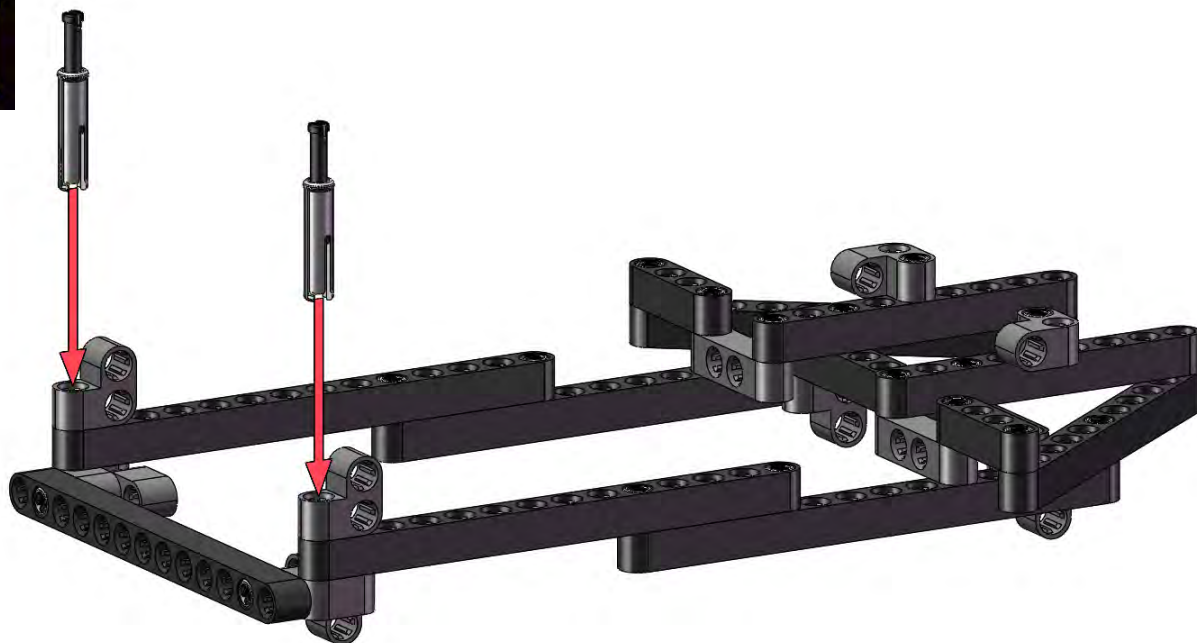
08

x3
4-BEAM

x3
2-45 BEAM

x6
TRANSITION

x6
2-LOCK
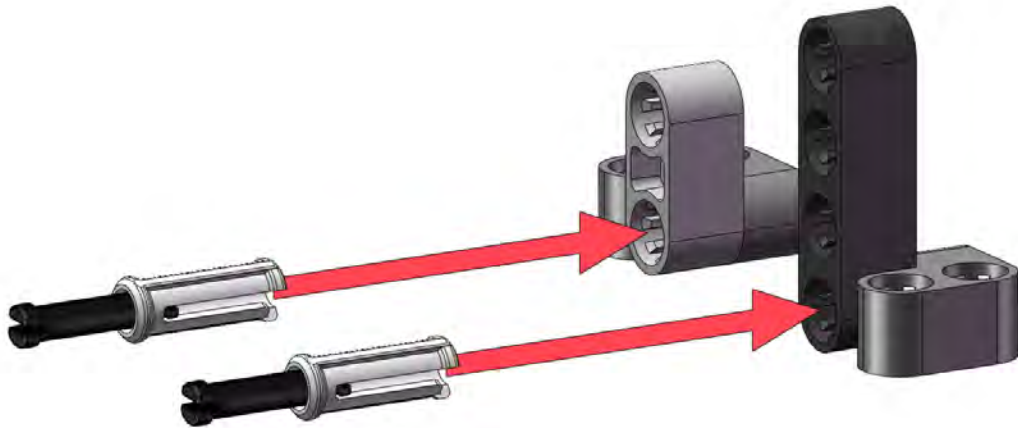
x3

09

x3
PING))) SENSOR

x6
#4-40 x 3/4" SCREW

x12
CLEARANCE THREAD ADAPTER

x6
INTERFERENCE THREAD ADAPTER
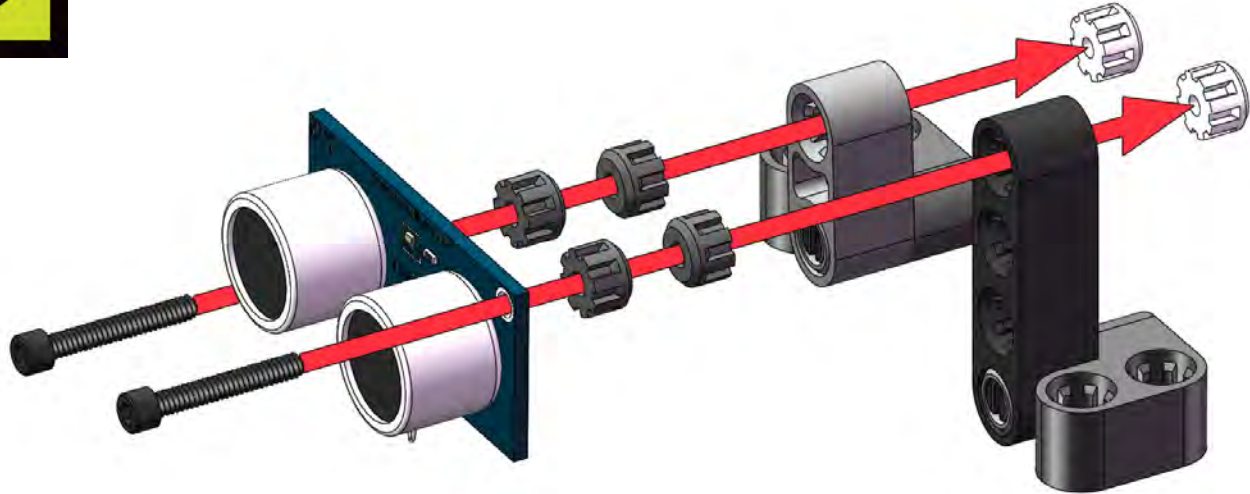
x3

10

x2
3-ROTATE

x4
2-LOCK
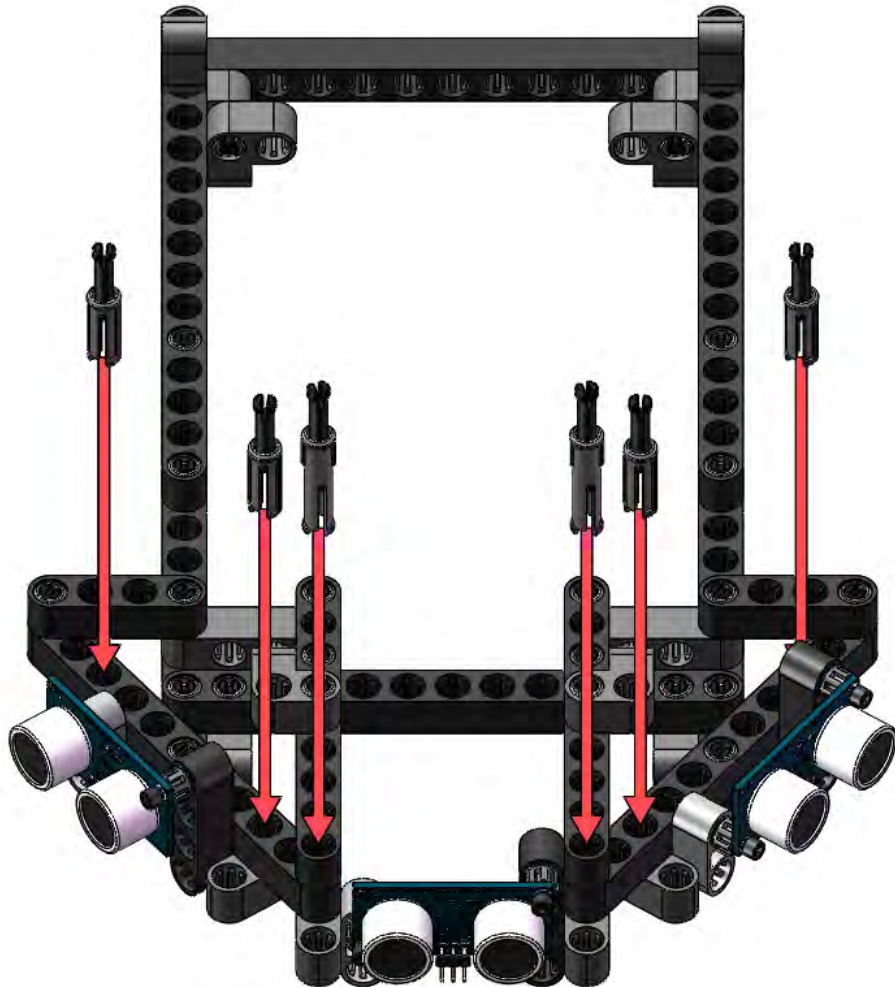
11

x1
ARDUINO UNO

x1
ARDUINO BASE PLATE

x4
CLEARANCE THREAD
ADAPTER

x4
#4-40 x 1/2" SCREW

x4
#4-40 NUT

DO NOT OVER TIGHTEN

12

x1
SENSOR SHIELD

13
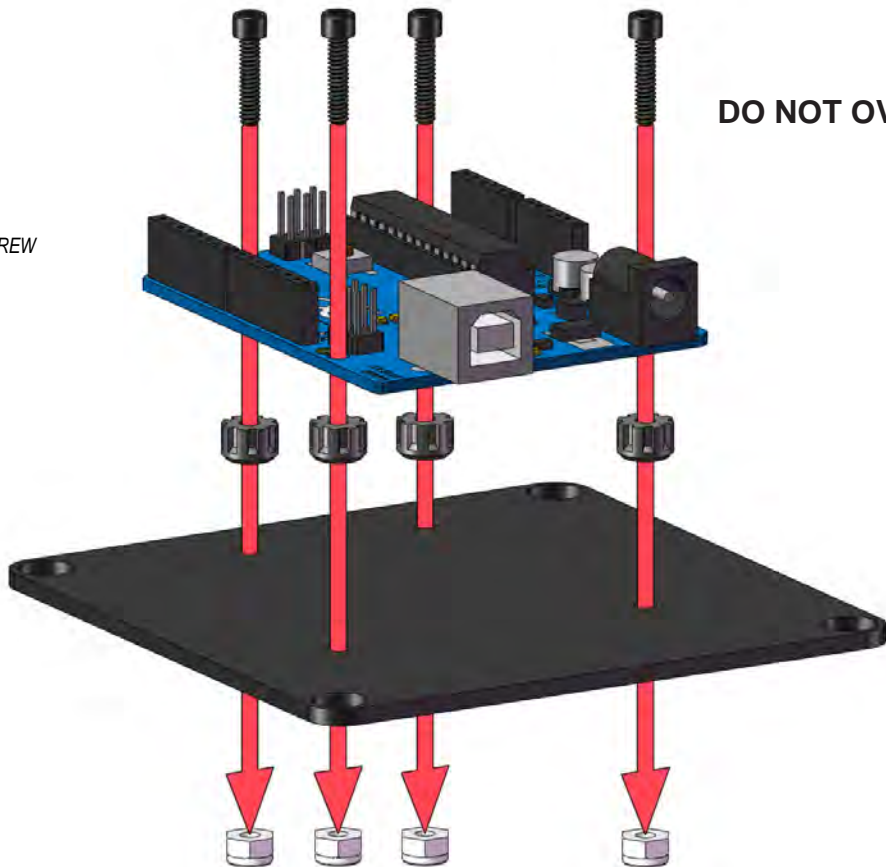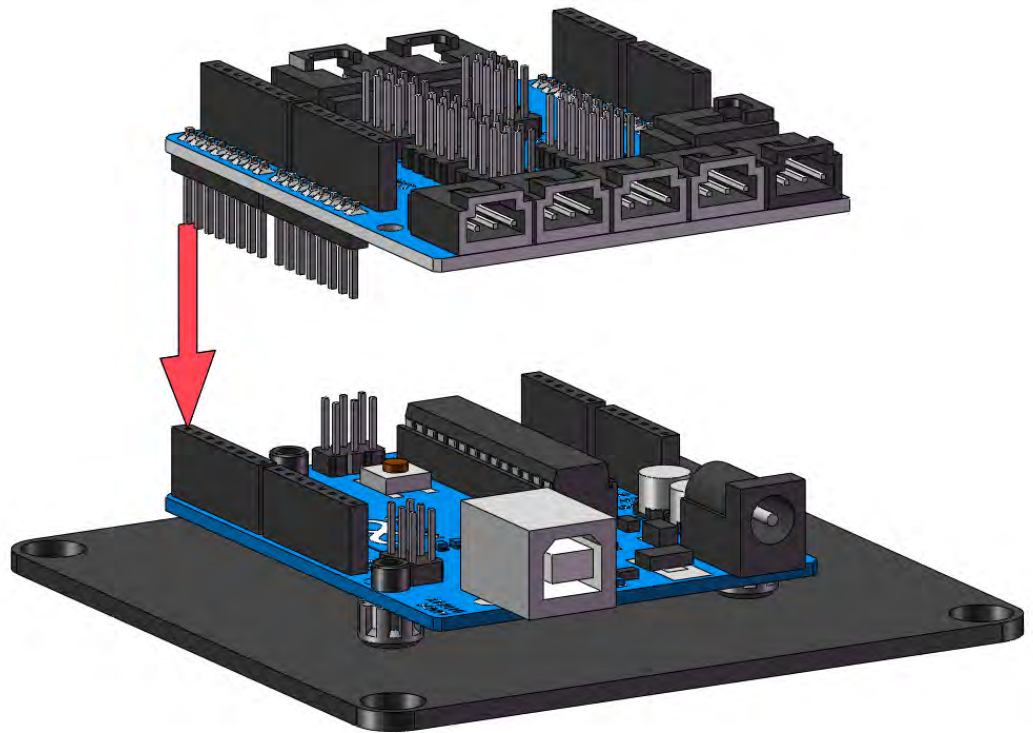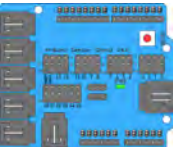
x1
13-BEAM

x1
11-BEAM

x4
PANEL-LOCK
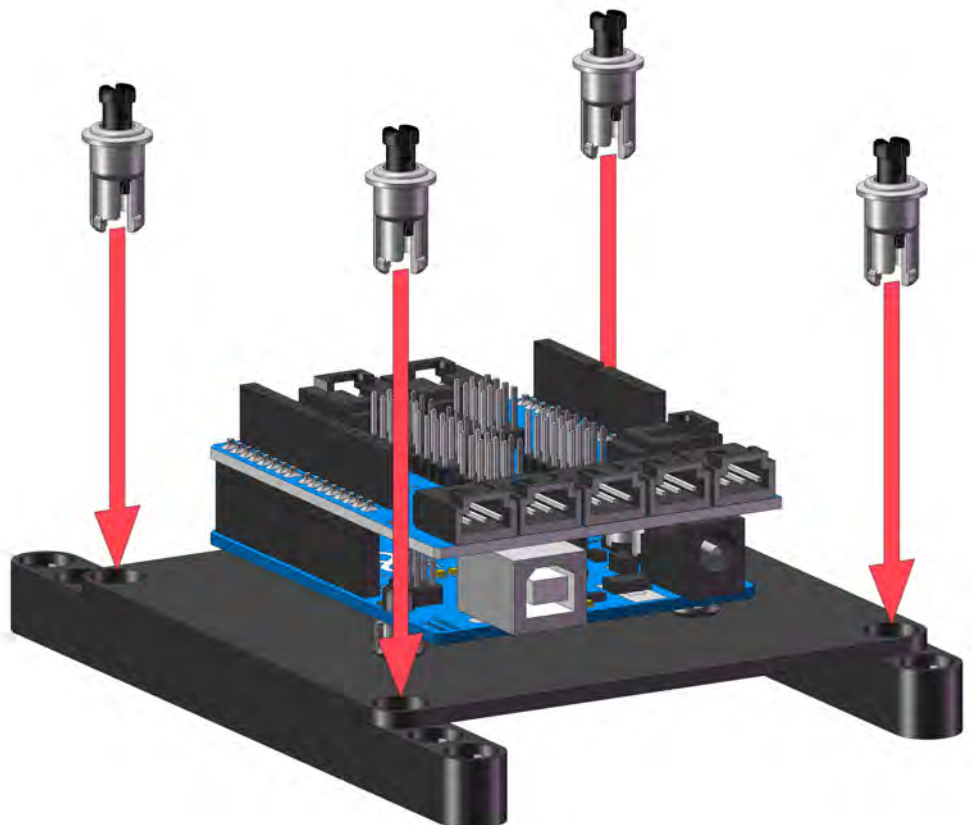
x2
2-BEAM

x6
2-LOCK

FOR USE WITH:

MINDS-i
CKE-TR04-001

4x4 Robot Kit
3-in-1

PRO-LINE
PROLINERACING.com

Helpful instructional videos available at: mindsirobotics.com

01
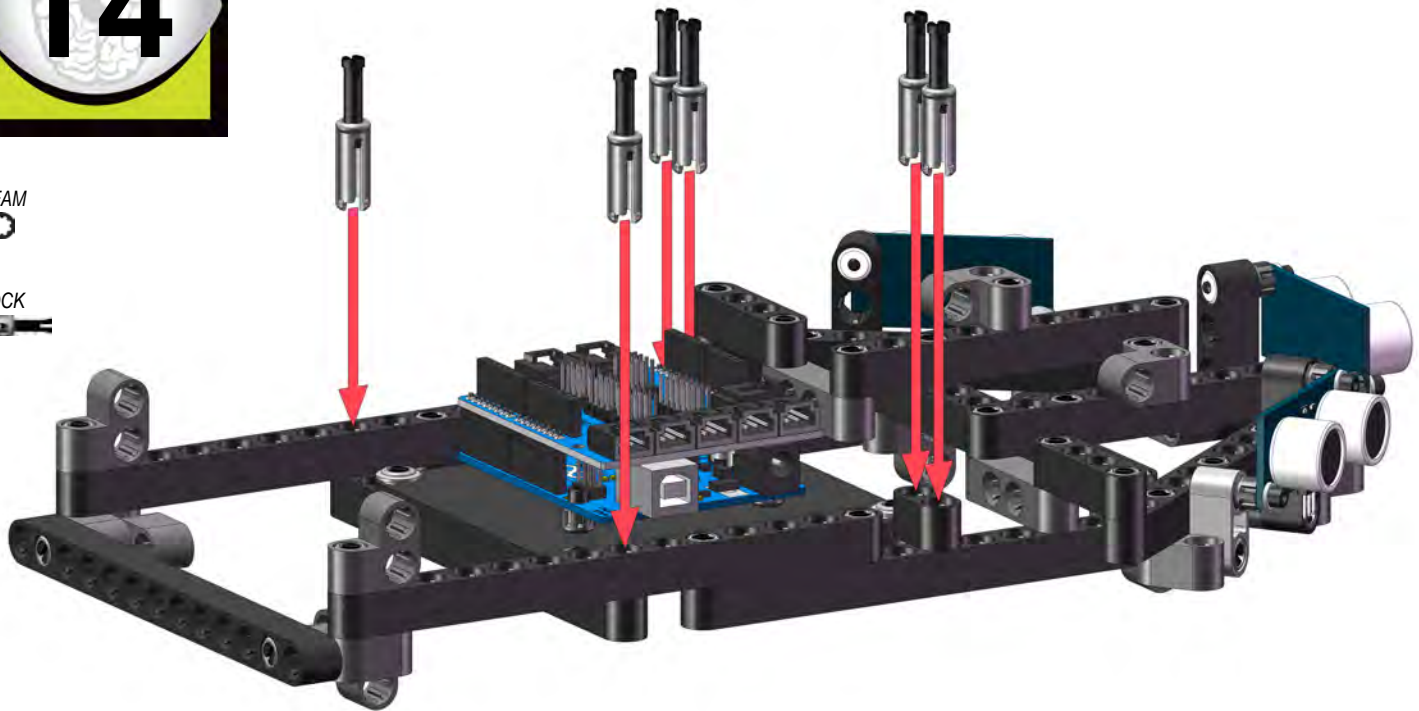
LEAF SPRING SUSPENSION

x4
2-LOCK

01
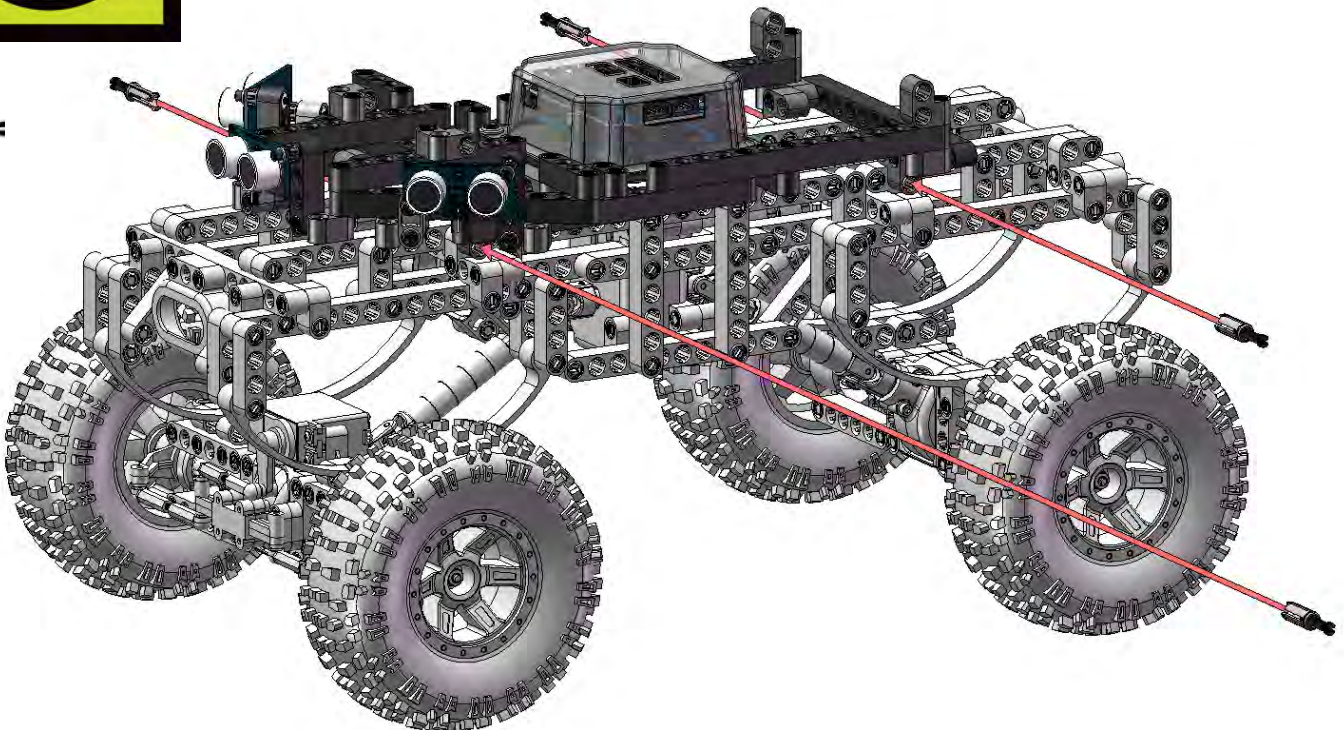
4-LINK SUSPENSION

x4
2-LOCK

01
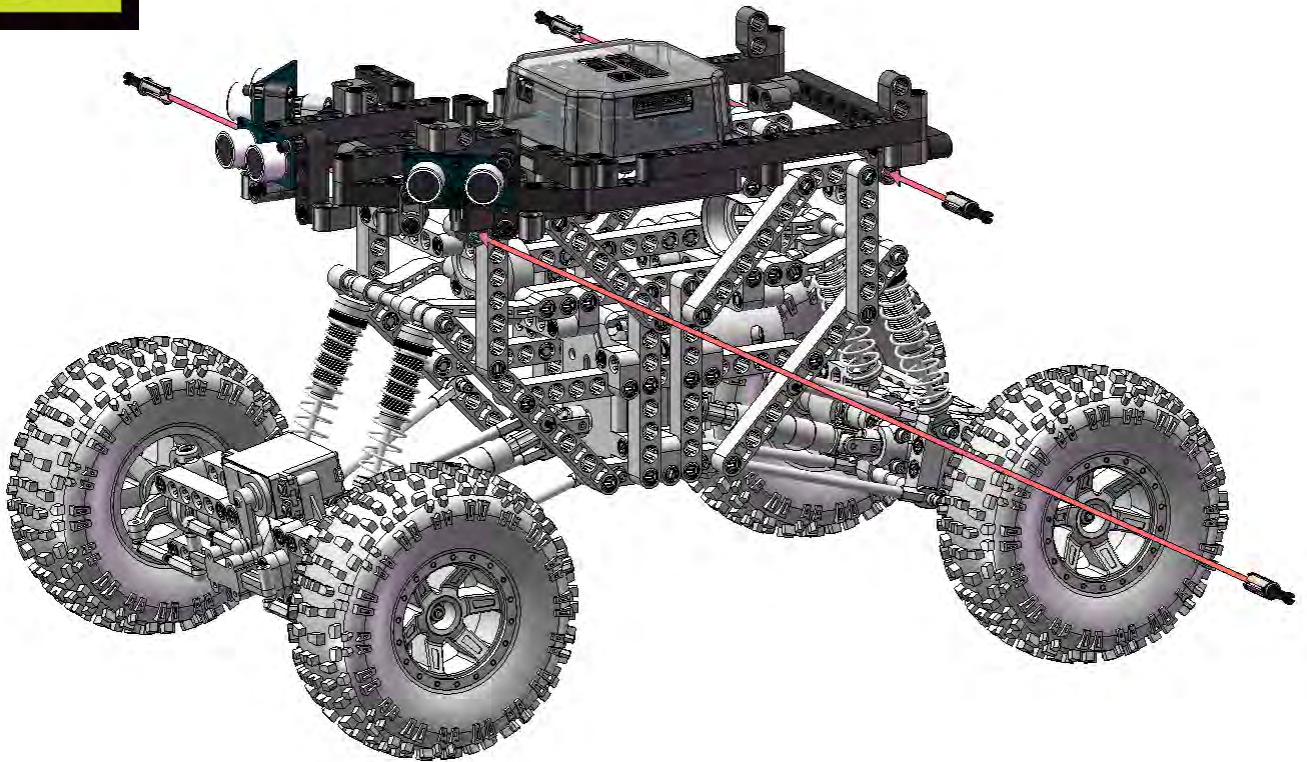
LADDER BAR SUSPENSION

x2
3-LOCK

x2
2-LOCK

FOR USE WITH:

MINDS-i

CKE-AV06-002

Super Rover Kit
2-in-1

PRO-LINE
PROLINERACING.com

Helpful instructional videos available at: mindsirobotics.com

01
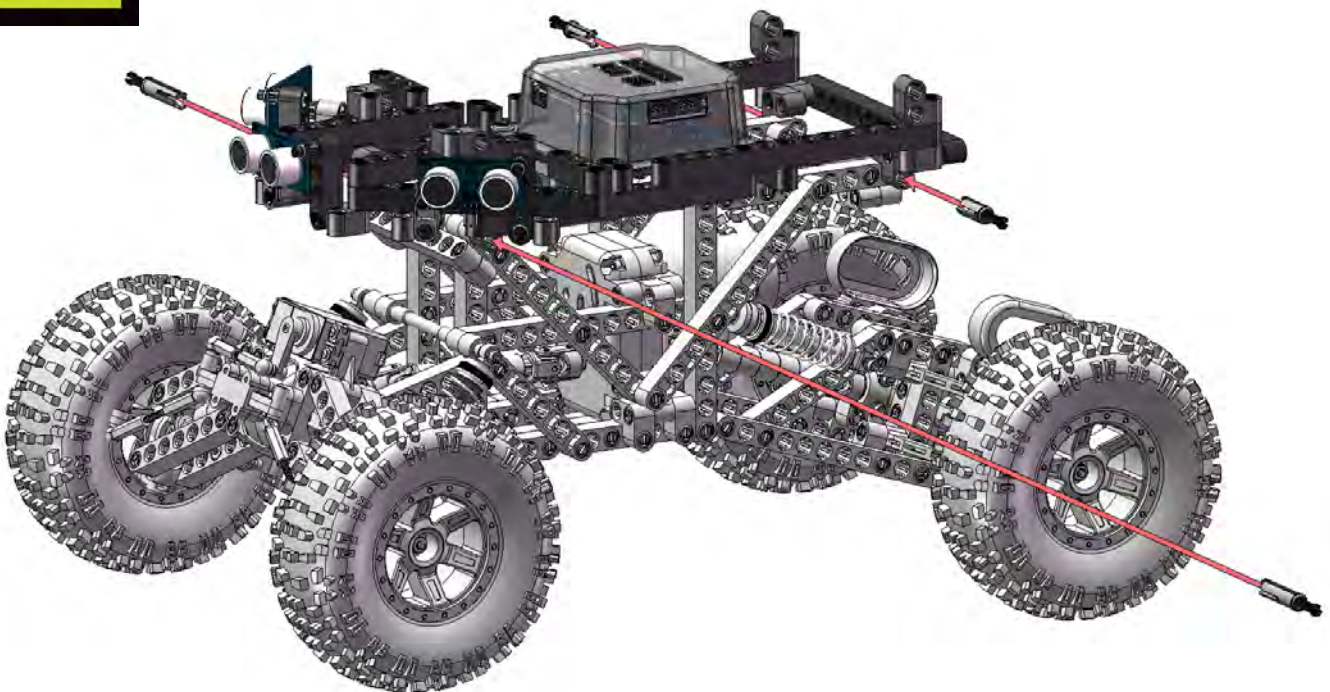
SUPER CRAWLER SUSPENSION

x4
2-LOCK
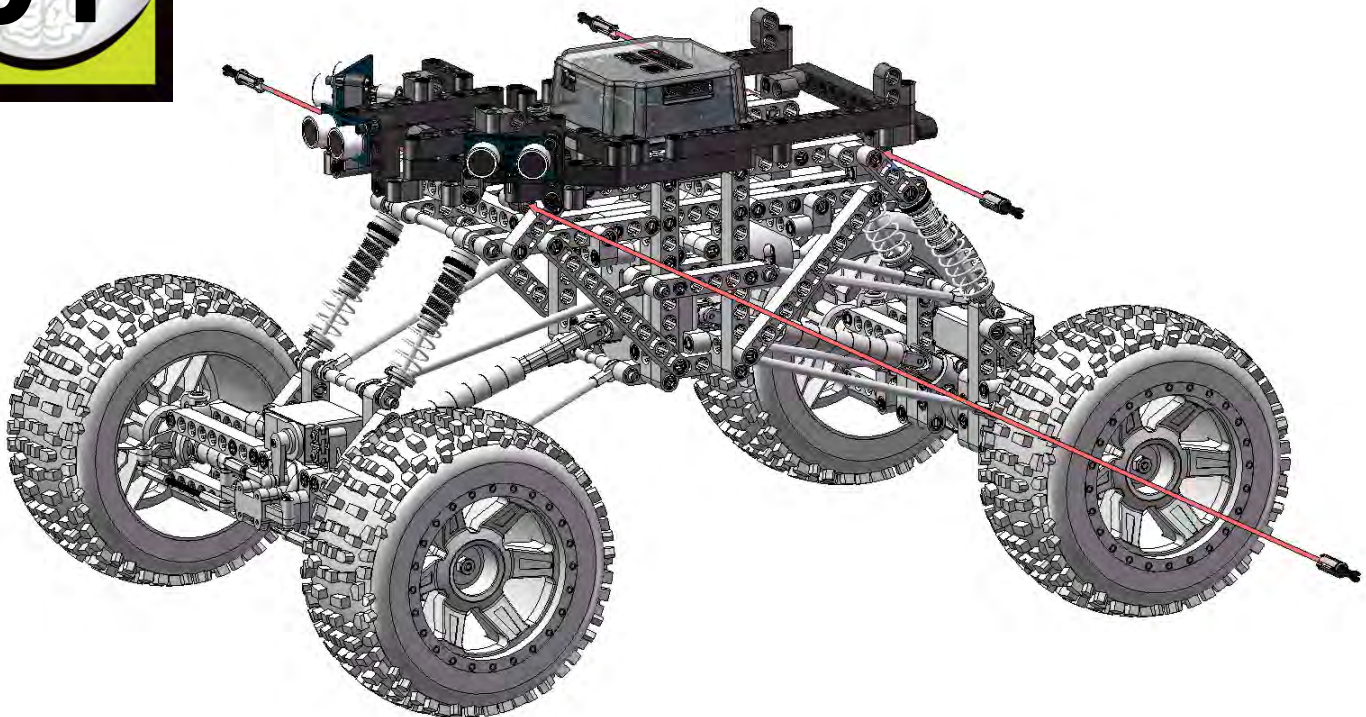
01 6x6 SUSPENSION

x4
TRANSITION

x4
2-LOCK

02
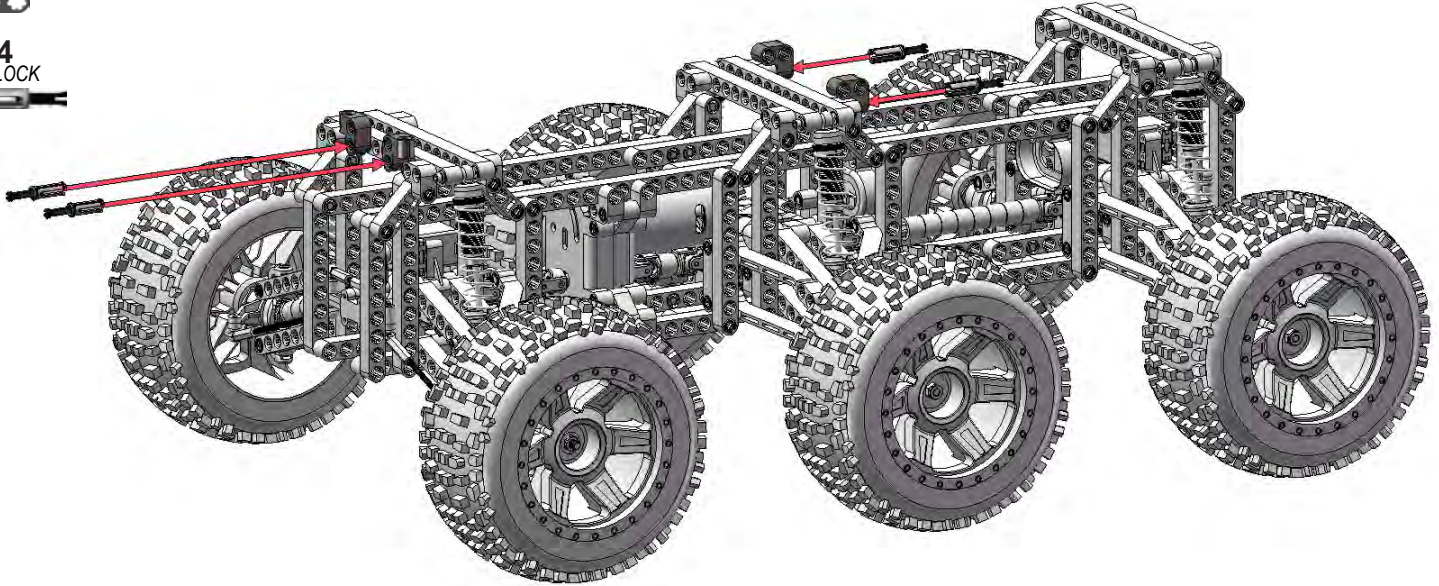
x4
2-LOCK
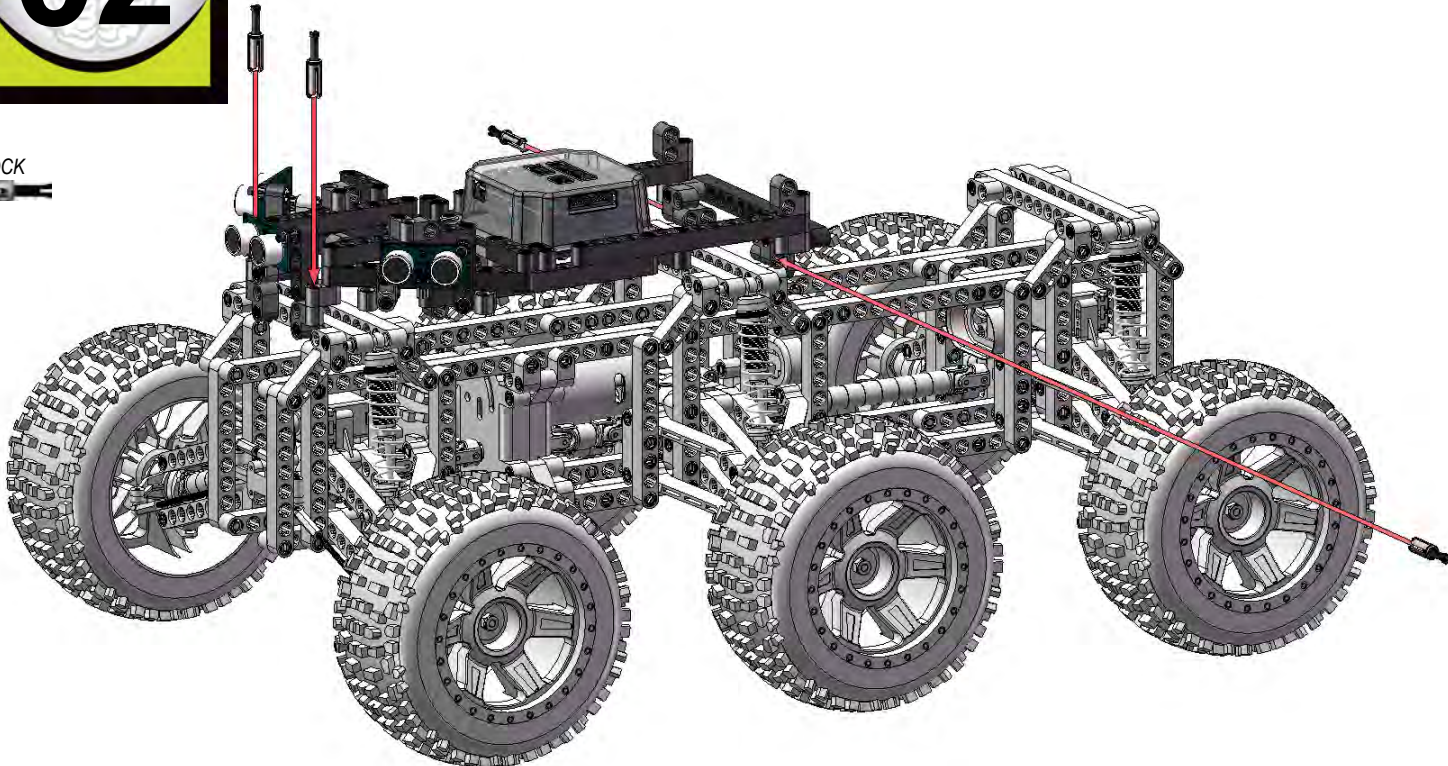
REFER TO ARDUINO USERS GUIDE FOR PROPER INSTALLATION AND SET-UP. USING THE WIRE TIES AND DOUBLE-SIDED TAPE PROVIDED, PLACE THE ELECTRONIC COMPONENTS ON THE FRAME SO THAT THEY ARE SECURE AND OUT OF THE WAY OF MOVING PARTS.

ULTRASOUND LEFT PIN 11

ULTRASOUND RIGHT PIN 10

ULTRASOUND FRONT PIN 9

SERVO PIN 5

⚠️ NOTE: Be sure to connect the red motor wire to the side of the motor with the red dot.

ESC-PIN 4

VOLTAGE REGULATOR

RECEIVER

RX CHANNEL 1 - ARDUINO PIN 2
RX CHANNEL 2 - ARDUINO PIN 3

BATTERY

VENOMPOWER
3000 mAh
7.2v HIGH POWER NIMH BATTERY

MOTOR
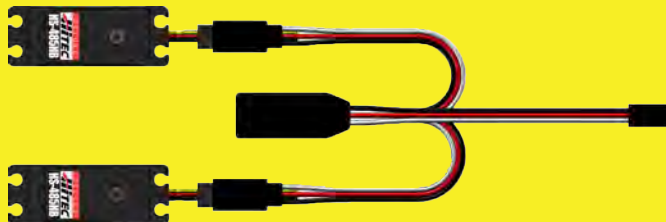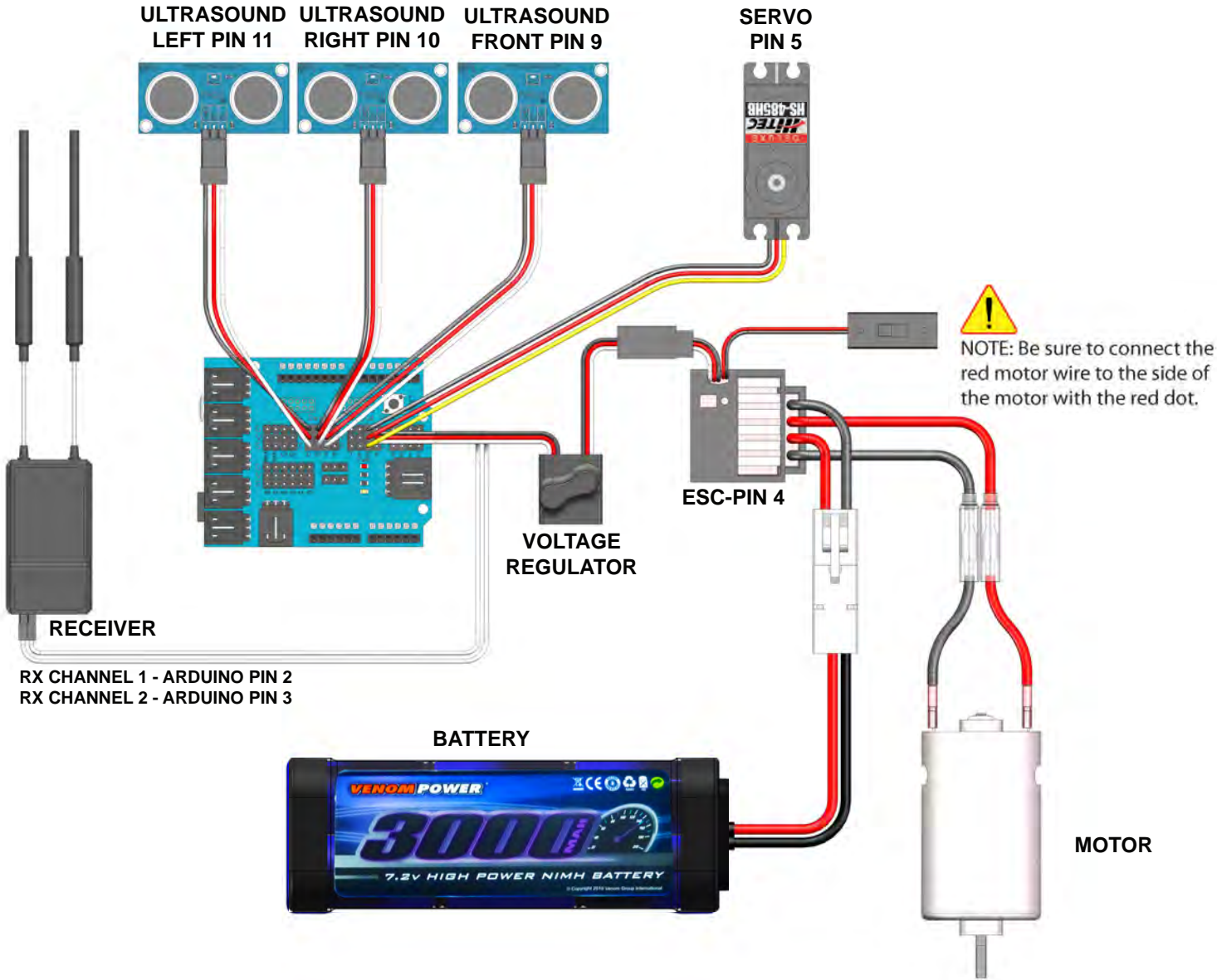
Note:
If you have 4 wheel steering you will need to insert your Servo Y-harness w/Reverser into pin 5.

FOR TECHNICAL SUPPORT, E-MAIL US AT info@mymindsi.com OR CALL 509-252-5767

WIRING POLARITY GUIDE

3-PIN WIRES

GROUND = **BLACK**
VOLTAGE = RED
SIGNAL = WHITE / YELLOW

4-PIN WIRES

GROUND = **BLACK**
VOLTAGE = RED
TX / SDA = WHITE
RX / SCL = YELLOW
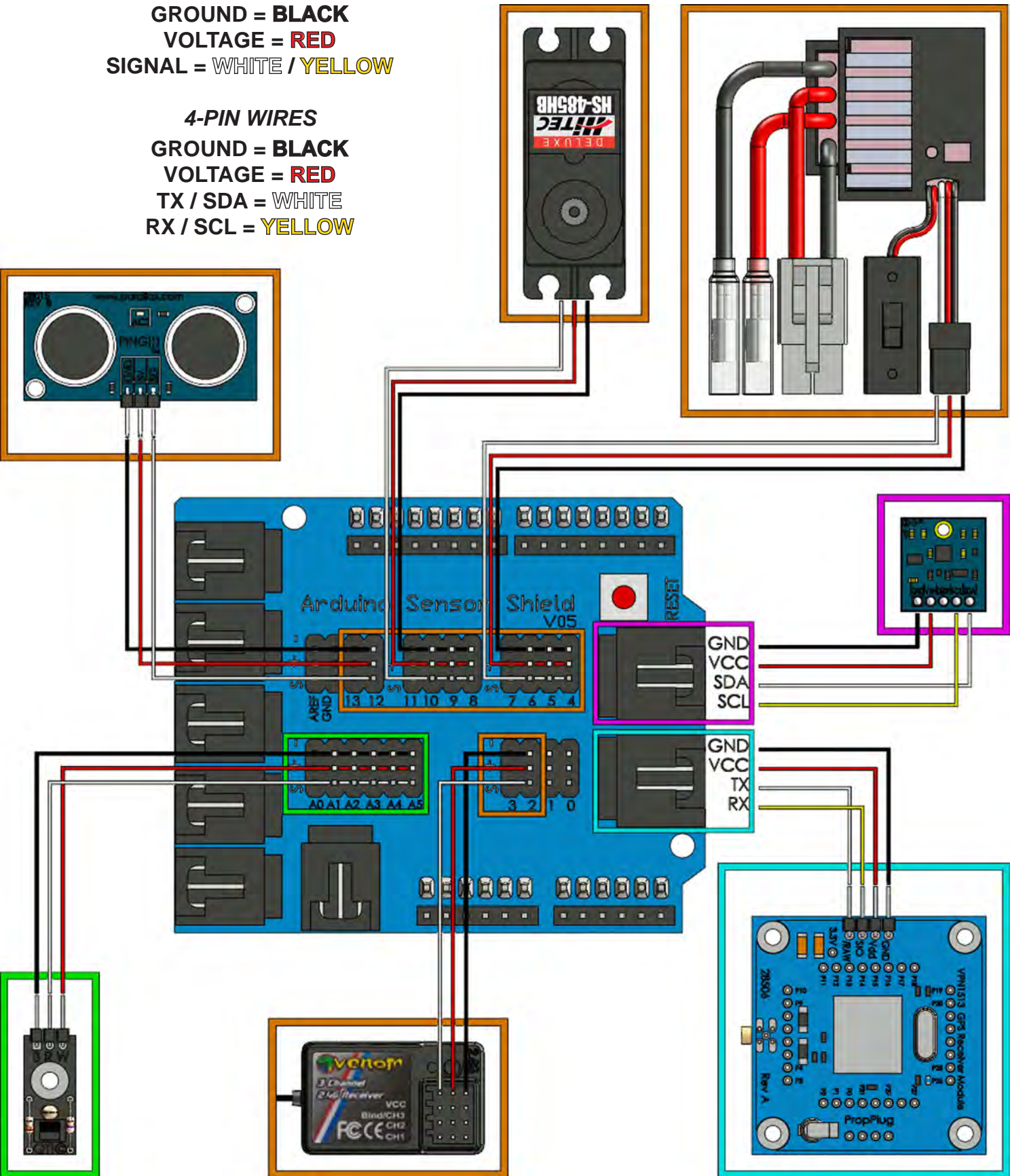
QUICK START GUIDE; Arduino setup and library installation.

1.   The Arduino IDE can be downloaded from the link below by selecting the version for your operating system.
          https://www.arduino.cc/en/Main/Software

2.   Once downloaded, follow the on screen instructions for installing Arduino.

3.   With Arduino installed navigate to the "Sketch" menu button. Click Sketch > Include Library > Manage library. A pop up window will appear.

4.   In the search bar type in "minds". You should see two Arduino libraries in the list you will want to install the "MINDSi by MINDSi corp" library.

5.   Close down and re open the Arduino IDE when the library finishes installation.

6.   You can find the library examples by clicking on the File > Examples > MINDSi.

VEHICLE TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	SOLUTION
Wheels rotate backwards when forwards throttle is applied.	1) One or more of your differentials are installed upside down.	1)Check the assembly instructions to make sure the differentials were installed correctly.
	2) The motor is spinning the wrong direction.	2) Check that the wires from the ESC to the motor are connected properly.
	3) The motor case was installed with the motor facing opposite of what the instructions show.	3) Check the assembly instructions to make sure the motor case was installed correctly.
	4) The "throttle" switch on your remote control may be switched to reverse.	4) Flip the switch to "Normal"
Front wheels rotate opposite of rear wheels when driving.	1) One of your differentials are installed upside down.	1) Check the assembly instructions for proper installation of the differentials.
Vehicle doesn't drive in a straight line with the steering channel centered.	1) Your steering trim is not centered.	1) Center your steering trim.
	2) Your servo horn was not installed on the servo while it was centered.	2) Remove the screw that retains the servo horn, then remove the servo horn. Turn the remote control on, center the trim on the remote, turn the vehicle on. Then reinstall the servo horn as the instructions show.
	3) The linkages that connect your steering bar to the front wheel knuckles are not the proper length or do not match each other.	3) Remove the linkages and check that they are the length indicated in your instructions.
	4) The "Y"harness for four wheel steering is not centered.	4) Follow step 2 for front and rear servo, making sure when you center the trim on the remote to also center the trim on the "Y"harness.
Servo does not operate when steering is applied.	1) Servo cable is plugged in upside down.	1) Check that the cable is plugged in according to the wiring polarity guide.
Servo steers only one direction or farther one way than the other.	1) Servo horn is not centered on the servo properly.	2) Remove the screw that retains the servo horn, then remove the servo horn. Turn the remote control on, center the trim on the remote, turn the vehicle on. Then reinstall the servo horn as the instructions show.
Vehicle has become under powered or sluggish.	1) Charge level of vehicle battery has dropped below useable level.	1) Remove battery from vehicle and charge with the recommended charger. Always follow proper safety procedures when charging a battery.
Vehicle stops unexpectedly or doesn't respond to remote.	1) Charge level of remote control batteries have dropped below useable level.	1) Check the remote control low battery indicator, if necessary replace or recharge batteries. Always follow proper safety procedures when charging a battery. Never recharge alkaline batteries.
	2) A wire may have come loose from the receiver.	2) Check that the wires are all properly plugged in and in good condition.
Vehicle does not move forwards or reverse when throttle is applied but audible tone comes from motor	1) Something has become bound up in the drivetrain.	1) Check the drivetrain from motor to wheels for foreign objects and debris. Removing the drivelines that connect the motor case to the differential(s) then trying to spin the wheels will allow you to more easily locate the issue.
Motor spins freely when throttle is applied but vehicle doesn't move.	1) Gear mesh in motor case was not properly set.	1) Check that the gear mesh was set according to the instructions. Gears should be about the thickness of this sheet of paper apart for proper mesh.
	2) Pinion set screw was not Properly tightened.	2) Check that the pinion set screw was tightened according to the instructions.

ARDUINO TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	SOLUTION
Vehicle is not behaving as programmed.	1) Charge level of vehicle battery has dropped below useable level.	1) Remove battery from vehicle and charge with the recommended charger. Always follow proper safety procedures when charging a battery.
	2) Inputs (sensors) or Outputs (servos, ESC, etc) are wired improperly.	2) Check that each device connected to the Arduino Sensor Shield is plugged in properly. Both in polarity and into the proper port the program states.
	3) Sensor is malfunctioning.	2) Check #2, Connect Arduino to computer using USB cable, run the calibration program for each sensor on the vehicle. If the sensor value is not present, uncharacteristic or erratic the sensor may need to be replaced.
Serial port "COM_" not found.	1) The Arduino is not connected to the computer.	1) Connect the supplied USB cable and try again.
	2) The proper serial port was not selected in the Arduino Program.	2) Disconnect, re-connect the USB Cable then go to Tools > Serial Port then select the Arduino Uno.
Light on Ping))) sensor is not cycling.	1) The Ping))) sensor is not wired properly.	1) Check the wiring polarity guide for proper installation.
	2) The Ping))) sensor in not connected to the proper port.	2) Check that the sensor is plugged into the port stated in the code.
QTI sensors not detecting line.	1) The QTI sensor is not wired properly.	1) Check the wiring polarity guide for proper installation.
	2) The QTI sensor in not connected to the proper port.	2) Check that the sensor is plugged into the port stated in the code.
Power light on Arduino Sensor Shield doesn't turn on when ESC is powered on.	1) One of the connections to the Sensor Shield is shorted.	1) Check that each device connected to the Arduino Sensor Shield is plugged in properly. Both in polarity and into the proper port the program states. If the problem persists disconnect one sensor at a time till the faulty connection (sensor, servo, ESC etc.) is found, then replace.
	2) No power source is connected to the Arduino	2) Check to make sure that it is either plugged into your computer with the USB cable or that you are using a charged battery and the ESC cable is properly connected.

http://arduino.cc/en/Guide/Troubleshooting

For technical questions or to place an order:

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Liberty Lake, Washington 99019

For the latest from MINDS-i visit:
mindsirobotics.com

For the most up to date version of the instructions go to:
mindsirobotics.com/instructions