Grand Blanc High School Robotics Team

Initial Member Level Deliverables

Electrical Component Board Wiring

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Mentor(s) to ask if you have questions about, and may sign off on this Challenge: Clinton Bolinger or Cathy Fillwock.

If you get stuck, ask a Veteran Student Team member (especially one who has electrical knowledge) to assist you BEFORE you ask a Mentor.

You will be working with one partner on this Deliverable. Please make a valiant effort to seek out another first-year Student who has not completed this Deliverable BEFORE you ask a Veteran Student to work with you.

BEFORE GETTING STARTED:

1. See Clinton, Brandi or Cathy in the conference room to check out "Electrical Board Wiring" Deliverables materials (if available), please sign the log:
   - One Electrical Wiring Board (Located to the left of the deliverable shelf in the Conference Room)
   - One box of components which should contain:
     - Power Distribution Panel (PDP) (1)
     - Talon SRX (1)
     - Victor SP (1)
     - Pneumatic Control Module (PCM) (1)
     - Voltage Regulator Module (VRM) (1)
     - Main Power Breaker (1)
     - "Radio" (substituted as a green box!) (1)
     - RoboRIO (1)
     - Black and Red Wires (3)
     - Green and Yellow Wires (4)
     - Black Wires (2)
     - Red Wires (1)
     - Wago Tool (1)
     - Zip-ties (many)
     - Small flathead screwdriver (1)
     - Dynamite Sticks (4)
2. Take an inventory of the components **BEFORE** you leave the Conference Room, using the photo checklist inside the components box. If any materials are missing, please inform one of the Mentors listed above BEFORE you get started.
3. Print one copy of the Electrical Board Layout Wiring Diagram Template for each person, using the Conference Room EngiPrinter (Brother HL-3170CDW series). The file is available here: http://www.team2337.com/uploads/8/2/9/1/8291371/2337_-_kop_chassis_electrical_layout_-_2015.pdf

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Challenge Information and Instructions:

1. *Students must work collaboratively on this Deliverable. It should NOT be that one person does all of (or even most of!) the work. Collaboration must be evident in work and notebook entries.*
2. You may build in the Wood Shop, Back Room, or Lunch Room.
3. Document your progress in your Engineering Notebook as you work.
4. SEE THE INSTRUCTIONS ON THE LAST PAGE OF THESE INSTRUCTIONS BEFORE ATTEMPTING TO USE THE WAGO TOOL.
5. Attach the red "dynamite sticks" to the underside of the component board.
6. Using appropriately sized zip-ties, attach all of the components in the kit to their appropriate location(s) on the component board.
7. Using the wire provided in the kit, effectively and efficiently wire all of the components:
    a. Connect the Talon SRX to the 40 amp circuits on the Power Distribution Panel (PDP). You will use the Wago tool to do this.
    b. Connect the Victor SP to the 40 amp circuits on the Power Distribution Panel (PDP).
    c. Connect the Pneumatic Control Module (PCM) to the PDP.
    d. Connect the Voltage Regulator Module (VRM) to the PDP.
    e. Connect the RoboRIO to the PDP.
    f. Connect the main Power Breaker to the PDP.
    g. Connect the Radio to the RoboRIO.
    h. Connect the Anderson Battery Connector to the Main Breaker.
    i. Connect the the Victor SP PWM wires to the RoboRIO.
    j. Create a Daisy Chain using CAN Bus to connect:
        i. Robo Rio > PCM
        ii. PCM > Talon
        iii. Talon > PDP
8. **You will NOT need to attach a battery.**
9. At the end of the meeting, you MUST:
    a. Check the kit back in with Brandi or Cathy - EVEN IF YOU ARE NOT DONE.
        i. If you were unable to finish, please indicate so on the sign-in/sign-out sheet.
        ii. If you were unable to finish, use a dry erase marker to write your name on the front side of the the kit, which will be reserved for you for up to two meetings.
        iii. If you do not show up for two consecutive meetings, the kit will be assigned to someone else.
    b. Clean your workspace AND the floor around you.
        i. Wipe off tables.
        ii. Push in chairs.
        iii. Sweep the floor.

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Engineering Notebook Entry Instructions:

*Note: each Student must complete an Engineering Notebook entry and while you may work together, you may NOT create identical or nearly identical entries. Mentors who validate Engineering Notebooks will be looking for unique entries and evidence of learning from **both** Students.*

1. Scissors, Glue Sticks, Colored Pencils and Markers are available for use in the conference room. Please make sure you return them when you're done.
2. Trim the Electrical Board Layout Wiring Diagram Template to fit into your Engineering Notebook, glue it down, before or after you:
    a. Draw a color-coded illustration of the final result of your wiring,
    b. Label all components,
    c. Label all wires (including type and gauge)
3. Answer the following questions in complete sentences, and/or copy down the questions:
    a. What difficulties did you run into while wiring the components?
    b. What did this task teach you about wiring that may assist you if you are a member of the programming or mechanical team?
    c. Why are proper wiring techniques important?
    d. Why is it important to use the right tool and the right materials for each job?
    e. Did completing this task increase your interest in the Electrical Section of the FRC Team? Why or why not?

To Complete Your Challenge:

1. Both Students who worked on this Deliverable must be present at the time the Engineering Notebooks are validated.
2. Ensure that your Engineering Notebook entries are completed.
3. Find one of the Mentors listed at the top of this Deliverable and escort them to your workstation to inspect your completed work.
4. Ask one of the Mentors listed on this deliverable to approve your Engineering Notebook entry and have your deliverables checklist validated.
5. After you have completed the task and your Engineering Notebook has been validated, please:
    a. Detach all wires from the components (do not cut wires),
    b. Cut zip-ties to remove components from the board. Throw away used zip-ties.
    c. Detach the "Dynamite Sticks" from the component board.
    d. Return all components and tools to the box.
    e. Ensure that all of the items on the list are in the box. If anything is missing, please find it, because you had it when you started this deliverable.
    f. Refill the zip-ties in the kit from the bin in the Conference Room.
6. Return the kit to the Conference Room and see Brandi or Cathy to sign the check-in/check-out log.

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Using the Wago Connector Tool:

Watch this video: https://www.youtube.com/watch?v=t-zb7j4ikHM

- Take care to insert directly at a fixed angle, pressing straight in.
- Do not pry.
- The goal is to open the spring by pressing in the tool, not by prying.

1.