Test Project

Module B – Design and Robot Base Assembly

Duration: 3 Hours

Autonomous Mobile Robotics

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1. Introduction

In a large hotel guests frequently need simple food refills or a cold can of soda, but pulling a server away from other tables just to grab a can from the fridge is inefficient — especially during a rush when every trip counts. As a robotics technician you have been hired to design a system that will be attached to a common base robot to perform this type of task. Starting with a common well-tested base and then using multiple lightweight attachments is cheaper than building several complete robots from scratch. This helps control the deployment budget. It also will allow for easier maintenance and troubleshooting. If something breaks, you isolate whether it's a base problem (motors, wheels, sensors) or a module problem (rack, tray, arm), because the systems are decoupled.

In addition, your navigation, obstacle avoidance, and motor control code does not need to change based on payload — only the payload's own logic (like "detect an object" or "pickup and deliver an object") is task-specific. This is a huge win for scalability.

The proposed robotic solution must meet the following operational requirements:

Small, frequent, low-value trips — a soda run as an example exactly the kind of task that wastes a human worker's time relative to its value. It's the ideal candidate to automate because it's repetitive and doesn't require judgment

On-demand restocking — instead of servers checking tables constantly, guests could request a refill (via button, app, or QR code) and the robot handles it without interrupting staff.

Before an application-specific attachment can be installed, the base robot must be assembled and commissioned. Review the customer requirements, allocate tasks and resources, and complete the task allocation report before assembly. Then safely assemble the robot, commission the system, and complete the commissioning report.

2. Description of project and tasks

READ THE ENTIRE DOCUMENT BEFORE PROCEEDING.

Workplace safety procedures and protocols must be always demonstrated.

If you are advised of a safety infraction during this module, 0.5 of a mark will be deducted for each infraction. On the 3rd infraction, the Competitor will be stopped, and the evaluation will be based on work already completed.

Experts will not intervene unless there is a safety concern.

2.1 Required Components

The following is the list of required components to complete the task.

- Shanghai 2026 Full Collection
- Wire Pack
- Crimp Pack
- Crimper Pack
- Wire Labeller

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2.2 Schedule

The total duration of this module is **3 hours**.

TIME	TASK
00:00 – 03:00	Complete the assembly Module

Competitors should refer to the official competition schedule to determine the start and finish time of their allocated session. Before the end of the time block, competitors must:

- Clean and organize their workstation;
- Prepare for rotation to the next module;
- Leave the assembled base robot on the workbench;
- Leave the completed task allocation report and commissioning report with the robot; and
- Wait in the designated briefing area until released by the chief expert.

2.3 Task

Competitors are required to assemble the base robot allocated during the C1 morning briefing following the die roll.

Competitors are required to complete two reports:

- **Task Allocation Report** indicating which competitor is responsible for each task.
- **Commissioning Report** confirming that the assembled robot operates correctly.

Both reports will be provided as printed forms.

A wiring diagram will be provided and must be followed throughout the assembly. Some cables will be supplied ready for installation. Competitors must manufacture and install the remaining cables, label all cables, and use the specified wire gauge in accordance with the provided wire gauge chart.

The completed base robot will be used in subsequent competition modules. Therefore, all mechanical, electrical, and wiring work must be completed to a professional standard.

3 Instructions to the Competitors

Review the robot CAD/build instructions, allocate tasks and resources within the team, and complete the Task Allocation Report.

Use the robot CAD/build instructions and supplied equipment to assemble the base robot.

Complete, install, and label all wiring in accordance with the wiring diagram.

Perform the required mechanical and electrical inspections.

Complete the Robot Commissioning Report**.**

All competitors are building the same base robot; no modifications may be made to the base robot.

4 Equipment, machinery, installations, and materials required

4.1 Equipment provided by Competition Organizer

- All equipment, tooling, and materials in the Infrastructure List – see AMR Discussion Forum and Technical Description; ;
- Testing equipment such as a multimeter, and scale to weigh additional items; .

4.2 Equipment and material not permitted

- Non worldskills supplied Laptops (personal) or portable computers;
- Tablet's e.g. Android, IPAD etc.;
- Memory sticks/ Digital Storage;
- Digital music Player;
- Electronic organizer/diaries;
- Wireless communication devices;
- Non approved SD Cards – approval by Experts or delegate is required for all SD Card images;
- Any additional software not supplied by Competition Organizers unless approved by Experts;
- Purchased items modified in any way prior to the Competition;
- Equipment that is similar or operates in similar manner as supplied equipment. Example – if a metal cut-off saw is provided by Competition Organizers, then no team may provide their own metal cut-off saw;
- All raw materials, components, parts, purchased item, tools and equipment not permitted in the Technical Description and List of Materials Allowed and Not Allowed of the skill.