Getting Started with the Internet Connected Task Board

Thank you for your purchase! You are now the owner of an internet-connected task board! Follow the next few steps to get your device online so you can join the community of roboticists developing advanced automated manipulation skills.

Functions of the Board Controller

Power On: Hold Power button (Left of M5 Logo) for 2 seconds.
Power On (bypass WiFi Connect): Hold M5 (Button A) AND Power button (Left of M5 Logo) for 2 seconds.
Power Off: Hold Power button for 6 seconds.
Start Trial: Ensure all elements are in the starting positions then press the M5 Button to start trial clock.
Reset Trial: Press User button (Right of M5 Logo). The controller will automatically reset 30 seconds from the end of the trial.
Abort Trial: Press Trial Start Button AND Trial Stop Button at the same time.
Change Screens: Hold Button B for 2 seconds.

Connecting to the Internet

Configure your task board to automatically connect to your preferred wireless network using your PC or smartphone to access the Task Board WiFi Configuration Page. Power on the task board, connect to the WiFi SSID: “AutoConnect_task_board_123” where the last three numbers will correspond to the label on the side of the task board (SSID Password is "robothon"). Your PC or smartphone should open the WiFi Configuration Page automatically. If not, open a web browser and go to URL: “192.168.4.1”. Once on the Configuration Page, click the ”Configure” button. Select your desired WiFi from scanned list. Enter your SSID's WiFi password then click “Save”. The Task Board will automatically attempt to connect to new WiFi from now on. The Home Screen will be displayed after a successful connection is made.

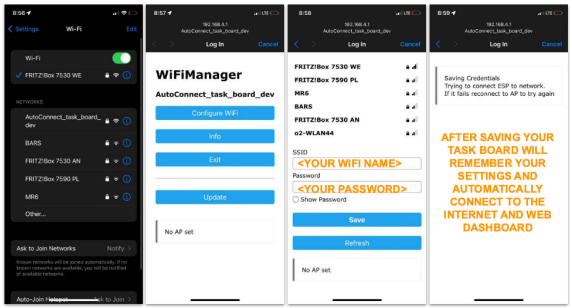
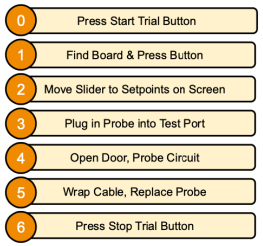
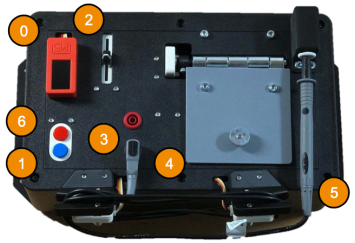


Image of iPhone Screenshots for Configuring new WiFi Connection

Timed Manipulation Trial Protocol

The task board is designed to emulate industrial tasks found in an electronic waste handling facility. It is designed to be used as a tool for developing, testing, and demonstrating robotic manipulation skill capabilities. The controller monitors the state of the task board and reports individual task completion times to a public web dashboard to easily share your results. View the web dashboard at the following URL: https://bit.ly/robothonTaskBoardWebDashboard/ or scan the QR code.

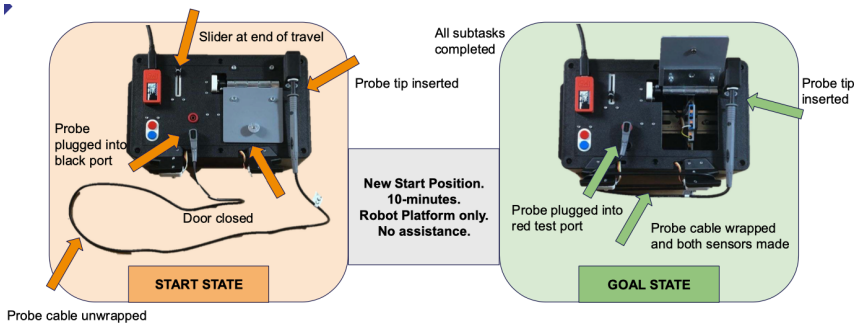




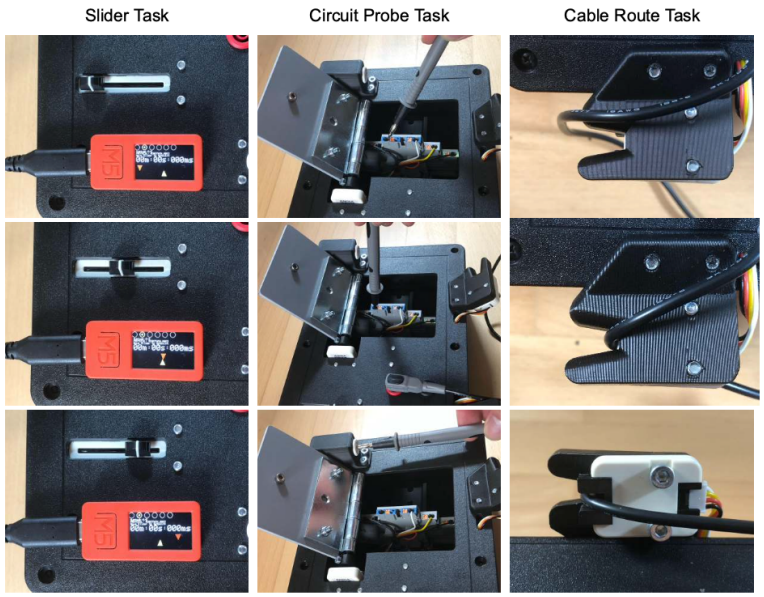
Task Board is fixed on flat table with velcro strips and repositioned before each trial.

Manipulation Tasks and Trial Protocol Execution Order

Use the task board with your own robot platform to demonstrate your skills. Velcro strips are provided on the bottom of the task board to easily reposition the task board between trial runs. Apply the bottom strips to a flat work surface and pry off and reposition the task board before starting a trial run with your robot to replicate the test conditions for teams competing in the Robothon Grand Challenge. This step is crucial to showcasing your robots object localization abilities and avoids teams from teaching fixed path solutions.



Task Board Start and Goal States



Details of the individual tasks

Robothon® 2023 at automatica

Robotic Manipulation Performance Benchmark Grading Sheet

Competition Web Dashboard: https://bit.ly/2Txx3kg

Instructions for Jury and Teams

Pre-Start Setup	The task board is picked up and placed in the competition area by the judge to randomize its position. Removable elements are placed in their starting nest positions.
Starting Condition	Operator presses the start button on the board to start the trial clock.
End Condition	When the trial clock reaches the maximum time of 10 minutes or the judge stops the trial. At the end of the trial the judge will add up all the earned points and record the trial time.
Scorecard	Judge will observe the trial and fill in the grey sections of the table with points earned by the team and their robot. Judge may award up to 2 additional bonus points to the team for qualitative attributes (creativity, innovation, impact).

Team Name:				Date:	Time:
Robot Platform	Manipulator:		End Effector:	Sensor1: Sensor2:	
Declared System Cost:				Tool:	

Task Board Obstacles

Task	Localize Board			Task	Move Plug			Task	Adjust Slider			Task	Probe Inner Circuit			Task	Stow Probe Cable		
Level 1		Points		Level 2		Points		Level 3		Points		Level 4		Points		Level 5		Points	
Subtask	Avail.		Earned	Subtask	Avail.		Earned	Subtask	Avail.		Earned	Subtask	Avail.		Earned	Subtask	Avail.		Earned
Press Blue Button		1		Pick up Probe Plug		1		Reach SP1 Center		1		Open door		2		Trigger post sensor		4	
				Insert Probe Plug		3		Reach SP2 on screen		3		Insert probe and close circuit		4		Insert Probe Tip into holder		1	
Task 1 Subtotal				Task 2 Subtotal				Task 3 Subtotal				Task 4 Subtotal				Task 5 Subtotal			
Max Pts		1	0	Max Pts		4	0	Max Pts		4	0	Max Pts		6	0	Max Pts		5	0
Method Used:				Method Used:				Method Used:				Method Used:				Method Used:			

Transferability Concept Object:
Comments:

Robothon Competition Robot Execution Trial Protocol Instructions and Scoring

	Score Category	Description	Rubric	Max Value
Submission Package	Recording	Continuous video recording (max length 10min) with points awarded from task board Bonus for Robustness.	Task 1: 1pt, Task 2: 4pts, Task 3: 4pts Task 4: 6pts, Task 5: 5pts Max: 20pts •Bonus multiplier for back-to-back demonstrations (task board must be repositioned between trials).	20 x 5 = 100
	Solution Transferability Demo	Team includes video demonstration of battery extraction of a device of their own choosing, e.g. smoke detector or TV remote.	•Local E-Waste Assignment (graded on 1-10 scale, averaged & mapped). Graded by jury for authenticity, number of fixtures required, task success, task execution time.	30
	Documentation	Team provides accurate description of their robot platform along with instructions on how to start their system.	•Repository has: - equipment used list, 10pts - software dependency list, 10pts - quick start guide. 10pts	30
Live Demo	Live Presentation	Team demonstrates solution to task board during 30min video call over Zoom. Bonus for Flexibility	•Team Interview - 1st Trial Demo, 20pts - 2nd Trial Demo, 20pts (Jury's Sequence) •Bonus awarded if team completes 2nd attempt with task order specified by jury in session.	20 + 20 = 40
	Total Team Score	-	-	**160 + 40 = 200**

Robothon Competition Team Submissions Instructions and Rubric

Going Further

Join the community on LinkedIn: https://www.linkedin.com/company/automatica/
Watch for new competitions and learn about previous competitions at www.robothon-grand-challenge.com.
Send your questions, feedback, and suggestions for new task board designs to peter@modularmotions.com.