MAKLUMAT PERTANDINGAN INOVASI

ITEM	PENERANGAN
Pertandingan	36TH International Invention, Innovation & Technology Exhibition 2025 (ITEX'25)
Tarikh	29th- 30th May 2025
Tempat	Kuala Lumpur Convention Centre (KLCC)
Projek	Nexus E-Tech Training Kit
Ahli	1. Ts. Ahmad Fauzi Shah Bin Mohd Arifin (Ketua) 2. Ts. Mohd Zaidy bin Muhammad Nasir 3. Ts. Suhana binti Naziran 4. Ts. Mohd Norazlinshah bin Mohd Salleh 5. Ts. Zuraini binti Ismail 6. Tc. Rizwan Bin Md Sabri 7. Tc. Ahmad Shukri Bin Abd Rahman 8. Noor Adlina binti Ibrahim
Keputusan	SILVER Medal
Abstract	Projek Nexus E-Tech ini telah dilaksanakan dengan matlamat utama untuk menambah baik kit pembelajaran robot industri yang sedia ada di CIAST. Pembangunan projek ini bertujuan meningkatkan pemahaman dan pengetahuan mendalam dalam modul Antaramuka Komunikasi Sistem Automasi Industri. Melalui reka bentuk paparan HMI yang dibangunkan, pengguna dapat mengawal dan memantau sistem feeder serta robot secara jarak jauh, memberikan kemudahan dan kecekapan dalam operasi. Selain itu, dengan penambahan sistem feeder, bahan kerja yang sebelum ini perlu diletakkan secara manual di tempat pengambilan robot kini dapat dihantar secara automatik dari stesen lain ke tempat pengambilan. Projek ini juga dilengkapi dengan fungsi tambahan yang membolehkan robot membezakan tiga warna bahan kerja yang digunakan, iaitu merah, hitam, dan kelabu. Penambahbaikan ini bukan sahaja memperluaskan fungsi kit pembelajaran tetapi juga menjadikannya lebih relevan dengan keperluan automasi industri moden.

ITEX'25

36TH INTERNATIONAL INVENTION, INNOVATION, TECHNOLOGY COMPETITION & EXHIBITION, MALAYSIA

NEXUS E-TECH

ABSTRACT

The Nexus E-Tech Innovation project revolutionizes the industrial robot learning kit at CIAST by integrating cutting-edge automation and communication technologies. Focused on enhancing the Automation System Communication Interface module, this development introduces a sophisticated Human-Machine Interface (HMI) that empowers users to remotely control and monitor robotic and feeder systems with enhanced flexibility and operational efficiency. A key innovation is the implementation of an automated feeder system, replacing manual workpiece placement by seamlessly transporting components between stations. Additionally, the system is now capable of color recognition, enabling the robot to distinguish between red, black, and grey workpieces. Together, these advancements elevate the learning kit to reflect real-world industrial automation standards, offering a more immersive and future-ready educational experience.

OBJECTIVES

Nexus E-Tech Innovation Project Objectives

Automated Feeder System Design

Purpose: Supply workpieces to robot automatically

✓ **Efficient Training:** No more manual interruptions

✓ **Real-World Simulation:** Mimics actual industrial automation

Interactive Human-Machine Interface (HMI)

Let users select workpiece patterns on a pallet easily

✓ **Hands-on HMI Experience:** Learn real automation tools

✓ **Flexible Learning:** Train robots for different setups

Inductive Sensor for Grey Workpiece Detection

Help the robot identify grey-colored items

✓ **Improved Accuracy:** Detect specific workpieces with ease

✓ **Sensor Technology Exposure:** Learn core automation tech

Inductive Sensor for Grey Workpiece Detection

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SOP

NEXUS E-TECH SOP

POWER ON THE SYSTEM
Turn on the main power switch. Make sure the red indicator light on the feeder is lit — this means the system is ready.

ACTIVATE THE FEEDER
On the HMI screen, press the "Start Feeder" button. The yellow light will turn on, indicating that the feeder is active.

SELECT A PALLET PATTERN
Press the "Start Select" button to begin the pattern selection process. You'll have 10 seconds to choose your preferred palletizing layout from the options shown on the HMI.

START THE ROBOT OPERATION
Once the pattern is selected, press the "Start Robot" button. The robot will automatically begin picking and placing workpieces based on the chosen pattern.

PALLETIZING IN PROGRESS
The system will continue running until 9 workpieces are completely arranged on the pallet.

RETURN WORKPIECES TO FEEDER
After reaching the 9-piece count, press the "Automatic" button. The robot will begin returning the workpieces from the pallet back to the feeder.

CHOOSE TO REPEAT OR END THE PROCESS
When the reset is complete, you'll be prompted on the HMI to choose:
- "Reset" – to repeat the entire palletizing process.
- "Finish" – to end the current session.

AUTHENTICITY

MyIPO

Perbadanan Harta Intelek Malaysia
Intellectual Property Corporation of Malaysia

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EMPOWERED MALAYSIA SKILLS INSTRUCTOR