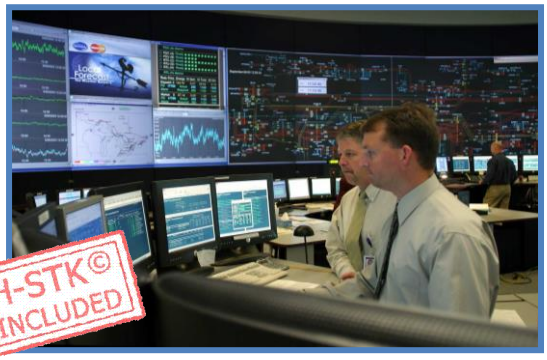
COURSE OVERVIEW IE0700
Process Control Cyber Security

Course Title
Process Control Cyber Security

Course Reference
IE0700

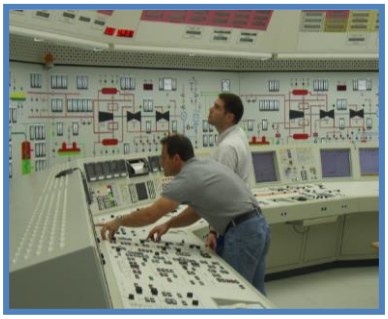
Course Duration/Credits
Five days/3.0 CEUs/30 PDHs



Course Date/Venue

Session(s)	Date	Venue
1	July 27-31,2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
2	December 24-28, 2025	Al Buraimi Meeting Room, Sheraton Oman Hotel, Muscat, Oman
3	January 25-29, 2026	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
4	April 26-30, 2026	Al Buraimi Meeting Room, Sheraton Oman Hotel, Muscat, Oman

Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using one of our state-of-the-art simulators.

The use of interconnected microprocessors in industrial systems has grown exponentially over the past decade. Deployed for process control in Programmable Logic Controllers (PLC) and Distributed Control Systems (DCS) for many years, they have now moved into Intelligent Electronic Devices (IED) in applications such as substations, Motor Control Centers (MCC), and heat trace systems. The concern is that their connecting networks have grown as well, usually without much attention to the security ramifications. Intrusions, intentional and unintentional, can cause safety, environmental, production and quality problems.

The need for protecting Industrial Control Systems has grown significantly over the last few years. The combination of open systems; an increase in joint ventures; alliance partners and outsourced services; growth in intelligent manufacturing equipment; increased connectivity to other equipment/software; enhanced external connectivity; along with rapidly increasing incidents of network intrusion, more intelligent hackers, and malicious software, all lead to increased threats and probability of attack. As these threats and vulnerabilities increase, so does the need for protection of Industrial and Control Systems.

This course introduces several categories of electronic security technologies and discusses specific types of applications within each category, the vulnerabilities addressed by each type, suggestions for deployment, and known strengths and weaknesses, as well as some forms of mitigation for the mentioned risks.

The course provides participants with practical methods for evaluation and assessment of many current types of electronic security technologies and tools that apply to the Industrial Control Systems environment, including development, implementation, operations, maintenance, engineering and other user services. It provides guidance to manufacturers, vendors, and security practitioners at end-user companies on the technological options for securing these systems against electronic (cyber) attack.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain a comprehensive knowledge on security of industrial control systems including SCADA, DCS & PLC and recognize their characteristics, threats and vulnerabilities
- Identify different ISA security standards and determine industrial control system security program development and deployment
- Emphasize network architecture in industrial control system and list down the recommended firewall rules for specific services
- Determine the various industrial control system security controls including management, operational & technical controls and identify the SCADA vulnerabilities & attacks
- Employ SCADA security methods, mechanisms & techniques and explain SCADA security standards and reference documents
- Acquire knowledge on SCADA security management implementation issues & guidelines and determine the unique characteristics & requirements of SCADA systems
- Analyze the selected ISA technical papers of security issues including the physical protection of critical infrastructures & key assets, critical infrastructure protection, network security in the wireless age, etc

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of cyber security of industrial control system (PLC, DCS, SCADA & IED) for a broad audience that includes asset owners from process, power and other critical infrastructures, control systems engineers, IT engineers, IT professionals, instrumentations engineers, instrumental & control staff, information and security officers and vendors, as well as security experts from government, industry associations and academia.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Haward's Certificates are accredited by the following international accreditation organizations:

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Dr. George Chel, PhD, MSc, BSc, Prince2, CISCO-CCNA, CISCO-CCENT, is a **Senior Communication & Telecommunications Engineer** with over **20 years** of extensive experience within the **Petrochemical**, **Oil & Gas** and **Power** industries specializing in **Fiber Optics** Technology, **Access Network** Planning, **Fiber Optics Transmission**, **Fiber Optic Cables** Construction, **Optical Drivers & Detectors**, **Fiber Optic** Termination, **Fiber Optic Cables** Installation, **Fiber Optics** System Design, **Media Converters**, **Fiber Optic** Systems Testing, **Optical Fibers** Technologies, **Opto-Electronics**, **Data Networking**, **Access Networks**, **Optical Networks**, DWDM, DSL, FTTH, GPON, **Wireless & Mobile Networks**, **Telecom** Technologies, **Core Network** Technologies, Broadband Architectures & Services, **Analogue & Digital Communications**, **IP Networking**, **Network Automation**, Software Defined Networking (**SDN**), Network Function Virtualization (**NFV**), Internet of Things (**IoT**), Converged Connectivity & Hybrid Access, RF Electronics & Digital Communications, **Communications Systems** Analysis, **Network Security**, **Computer Networks** Modelling & Simulation, **Data Networks & Communications**, **Networking Technology**, Networking Concepts, I**CT Systems** Management & Strategy, Strategic Information Systems, Wireless Access Points, Analogue & Digital Electronics, **Circuit Analysis**, **Circuit Design**, Electromagnetics, WiMAX Broadband Wireless System, Networking Design & Configurations, Practical **Industrial Data Communications & Telecommunications**, **Industrial Data Communication** Systems, Effective **Telecoms Strategies**, Integrated Electro-Optic Devices & Systems, **Telecom**, **Datacom & Network**, **EtherNet** Maintenance and Troubleshooting, Synchronous Digital Hierarchy (**SDH**), IP Telephony Design (**IPTD**) and LTE Technology (**WiMax**) Skills. He is currently the **Core Technologies Section Manager** of Hellenic Telecommunications Organization wherein he is responsible for managing, carrying, conducting, leading and participating in projects relating to the design, evaluation and trial of new aggregation/core network services & systems projects.

During his career, Dr. Chel has gained his practical and field experience through his various significant positions and dedication as the **Deputy Manager**, **Project Manager**, **Lab Section Head**, **Deputy Section Head**, **Program Leader**, **Access Technologies Senior Expert**, **Access Network Development Engineer**, **Telecom Engineer**, **Technical Engineer**, **Senior Expert**, **Senior Technical Instructor/Lecturer**, **Part-Time Lecturer**, **Development Engineer**, **R&D Engineer** and **Research Programmes Engineer**, **Post-Doctoral Research Associate** and **Teaching & Laboratory Assistant** from the Hellenic Telecommunication Organization – Deutsche Telekom Group, Fixed Access Shared Service Center – Deutsche Telekom Technology, OTE Academy, Athens Metropolitan College and Imperial College London.

Dr. Chel has a **PhD** in **Photonics**, **Optical Communications & Opto-Electronics** from the **Imperial College London**, **UK**, a **Master** degree in **Medical Physics & Clinical Engineering** from the **University of Sheffield**, **UK**, a **Bachelor** degree in **Physics** from the **University of Crete**, **Greece** and a **Graduate Diploma** in **Management** from the **University of London**, **UK**. Further, he is a **Certified Instructor/Trainer**, a **Registered PRINCE2 Project Management Practitioner**, a **Cisco Certified Network Associate Routing** and **Switching** (**CCNA**) and a **Cisco Certified Entry Networking Technician** (**CCENT**). Moreover, he is an author of many books, technical publication at high-profile scientific journals and conferences and deliver numerous trainings, courses, workshops, seminars and conferences internationally.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Fee

US$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 - 0930	***Overview of Industrial Control Systems*** *Overview of SCADA, DCS and PLCs ● Industrial Control System Operation ● Key Industrial Control System Components ● SCADA Systems ● Distributed Control Systems ● Programmable Logic Controllers ● Industrial Sectors and Their Interdependencies*
0930 - 0945	*Break*
0945 - 1030	***Industrial Control System Characteristics, Threats & Vulnerabilities*** *Comparing Industrial Control System and IT Systems ● Threats ● Potential Industrial Control System Vulnerabilities ● Risk Factors ● Possible Incident Scenarios ● Sources of Incidents ● Documented Incidents*
1030 - 1230	***ISA Security Standards*** *ANSI/ISA-TR99.00.01-2004 ● ANSI/ISA-TR99.00.02-2004 ● ANSI/ISA-TR99.00.01-2007*
1230 - 1245	*Break*
1245 - 1420	***ISA Security Standards (cont'd)*** *ANSI/ISA-TR99.00.02-2007 ● ANSI/ISA-TR99.00.03-2007 ● ANSI/ISA-TR99.00.04-2007*
1420 - 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2

0730 - 0900	***Industrial Control System Security Program Development & Deployment*** *Business Case for Security*
0900 - 0930	***Industrial Control System Security Program Development & Deployment (cont'd)*** *Developing a Comprehensive Security Program*
0930 - 0945	*Break*
0945 - 1230	***Network Architecture*** *Firewalls ● Logically Separated Control Network ● Network Segregation ● Recommended Defense-in-Depth Architecture ● General Firewall Policies for Industrial Control System ● Recommended Firewall Rules for Specific Services*
1230 - 1245	*Break*
1245 - 1420	***Network Architecture (cont'd)*** *Network Address Translation (NAT) ● Specific Industrial Control System Firewall Issues ● Single Points of Failure ● Redundancy and Fault Tolerance Preventing Man-in-the-Middle Attacks*
1420 - 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3

0730 - 0900	***Industrial Control System Security Controls*** *Management Controls ● Operational Controls*
0900 - 0930	***Industrial Control System Security Controls (cont'd)*** *Technical Controls*
0930 - 0945	*Break*
0945 - 1230	***SCADA Vulnerabilities & Attacks*** *The Myth of SCADA Invulnerability ● SCADA Risk Components ● Managing Risk*
1230 - 1245	*Break*
1245 - 1420	***SCADA Vulnerabilities & Attacks (cont'd)*** *SCADA Threats and Attack Routes ● SCADA Honeynet Project*
1420 - 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4

0730 - 0900	***SCADA Security Methods & Techniques*** *SCADA Security Mechanisms ● SCADA Intrusion Detection Systems*
0900 - 0930	***SCADA Security Methods & Techniques (cont'd)*** *SCADA Audit Logs ● Security Awareness*
0930 - 0945	*Break*

0945 - 1230	***SCADA Security Standards & Reference Documents*** *ISO/IEC 17799:2005 and BS 7799-2:2002 ● ISA-TR99.00.01-2004 Security Technologies for Manufacturing and Control Systems ● ISA-TR99.00.02-2004 Integrating Electronic Security into the Manufacturing and Control Systems Environment ● GAO-04-140T Critical Infrastructure Protection, Challenges in Securing Control Systems*
1230 - 1245	*Break*
1245 - 1430	***SCADA Security Standards & Reference Documents (cont'd)*** *NIST, System Protection Profile for Industrial Control Systems (SPP ICS) ● Federal Information Processing Standards Publication (FIPS Pub) 199, Standards for Security Categorization of Federal Information and Information Systems, February 2004 ● Additional Useful NIST Special Publications*
1420 - 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

Day 5

0730 - 0900	***SCADA Security Management Implementation Issues & Guidelines*** *Management Impressions of SCADA Security ● SCADA Culture ● Unique Characteristics and Requirements of SCADA Systems*
0900 - 0930	***SCADA Security Management Implementation Issues & Guidelines (cont'd)*** *Limitations of Current Technologies ● Guidance for Management in SCADA Security Investment ● NIST Special Publication 800-26, Security Self-Assessment Guide for Information Technology Systems*
0930 - 0945	*Break*
0945 - 1230	***Selected ISA Technical Papers on Security Issues*** *The Physical Protection of Critical Infrastructures and Key Assets ● Critical Infrastructure: Control Systems and the Terrorist Threat ● Critical Infrastructure Protection: Challenges and Efforts to Secure Control Systems ● The Myths and Facts Behind Cyber Security Risks for Industrial Control Systems ● Network Security in the Wireless Age*
1230 - 1245	*Break*
1245 - 1345	***Selected ISA Technical Papers on Security Issues (cont'd)*** *Remote Method Security in a Distributed Processing Architecture Supporting Generic Security Objects ● Current Status of Technical Issues Concerning Cyber Security of Control Systems for Water and Wastewater Industries ● Intrusion Detection and Cyber Security Monitoring of SCADA and DCS Networks ● 21 Steps to improve Cyber Security of SCADA Networks*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 - 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using one of our state-of-the-art simulators "Allen Bradley SLC 500", "AB Micrologix 1000 (Digital or Analog)", "AB SLC5/03", "AB WS5610 PLC", "Siemens S7-1200", Siemens S7-400" "Siemens SIMATIC S7-300", "Siemens S7-200" "GE Fanuc Series 90-30 PLC", "Siemens SIMATIC Step 7 Professional Software", "HMI SCADA" and "PLCLogix 5000 Software".

Allen Bradley SLC 500 Simulator

Allen Bradley Micrologix 1000 Simulator (Digital)

Allen Bradley Micrologix 1000 Simulator (Analog)

Allen Bradley SLC 5/03

Allen Bradley WS5610 PLC Simulator PLC5

Siemens S7-1200 Simulator

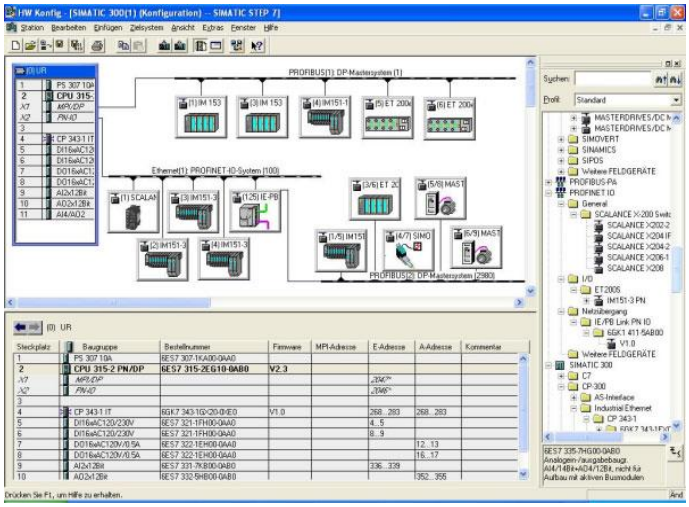
Siemens S7-400 Simulator

Siemens SIMATIC S7-300

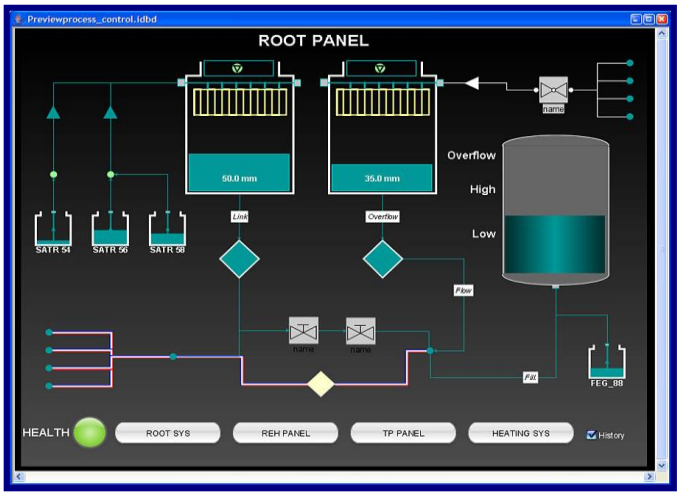
Siemens S7-200 Simulator

GE Fanuc Series 90-30 PLC Simulator

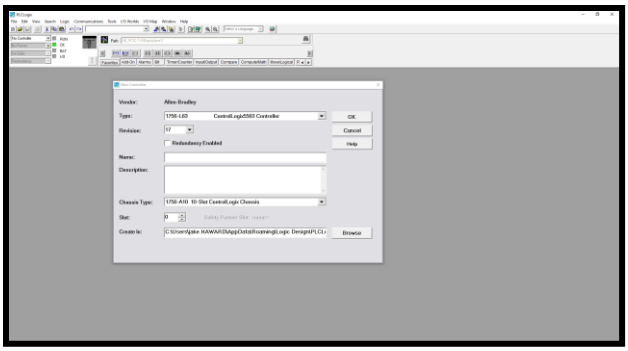
Schneider Electric Magelis HMISTU

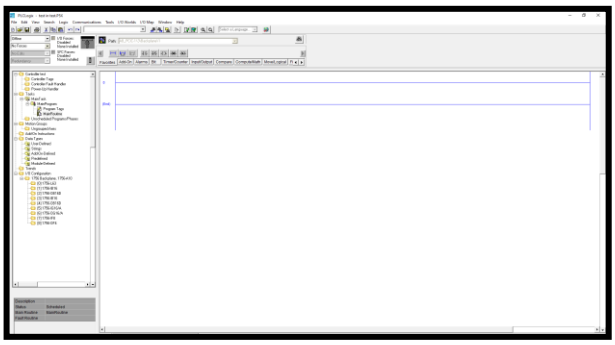


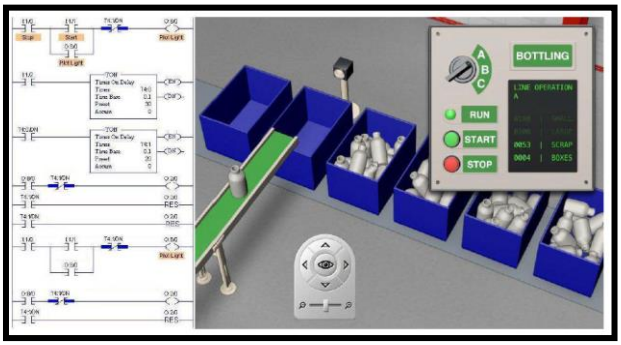
Siemens SIMATIC Step 7
Professional Software

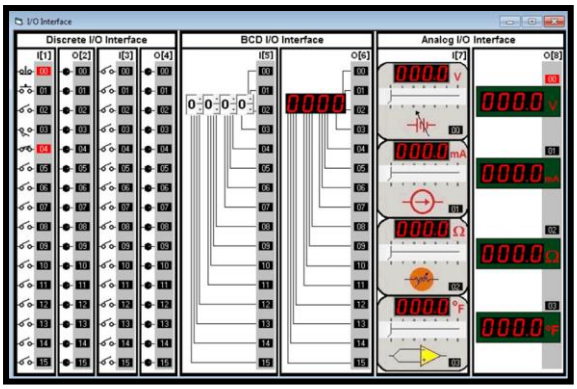


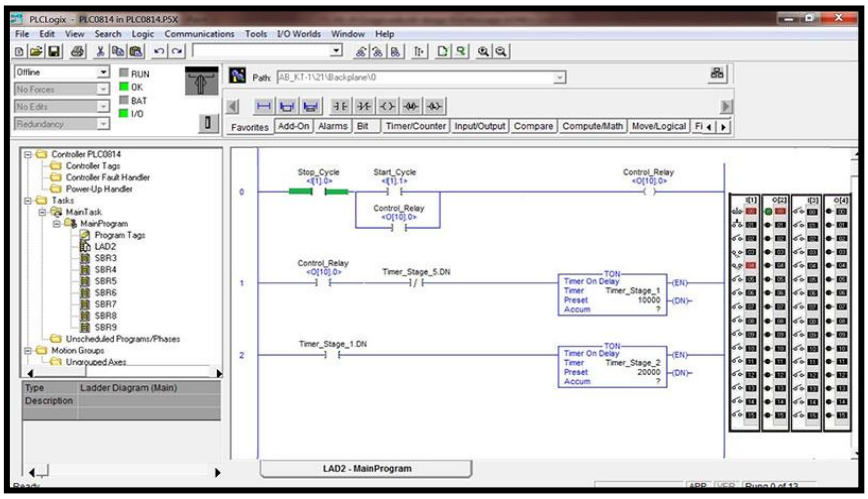
HMI SCADA











PLCLogix 5000 Software

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org