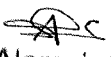




ToR of Programmable Logic Controller (PLC)

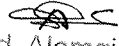
- 22 days of training must be provided to the teachers on the supplied materials as described in the specification.
- Complete module of relevant experiments with coding & others to be handed over at the time of training.
- Operational module must be provided.
- Add power system requirements if any during submitting the proposal.
- The warranty period must be two years.
- Minimum one year free service period must be provided.
- Must have relevant work experience.


Md. Alamgir Hossain
Head of TVET Institute
UCEP Mirpur TVET Institute



SK. Tanzir Kamal
Senior Officer F & A
UCEP Dhaka North Region




Md. Anowarul Islam
Regional Manager
UCEP Dhaka North Region

Sl. No.	Description	Quantity	
1.	<p>Custom Built PLC Training Kit -</p> <ol style="list-style-type: none"> 1. SIEMENS PLC CPU- SIMATIC S7-1200 COMPACT <ul style="list-style-type: none"> • Profinet Communication • Brand: SIEMENS • CoO: China 2. SIEMENS SIMATIC SOFTWARE <ul style="list-style-type: none"> • TIA Portal Single License • Brand: SIEMENS • CoO: Germany 3. SIMATIC WinCC high-performance SCADA software <ul style="list-style-type: none"> • Operator functions • Graphics and trend display • Alarm logging • Report system • Archiving Recipe management • User management 4. SIEMENS SIMATIC HMI <ul style="list-style-type: none"> • Design: TFT widescreen display, LED • Operation: Key/touch • Display size: 4" TFT display • PROFINET interface • Horizontal image resolution: 480 pixel • Vertical image resolution: 272 pixel • Number of function keys: 4 • Brand: SIEMENS • CoO: Germany 5. Power Supply Unit (MEAN WELL) <ul style="list-style-type: none"> • Stabilized power supply • Type of the power supply: 1-phase AC • supply voltage: 120-240 VAC Output: Controlled, isolated DC voltage • Rated output voltage: 24V • Rated output current: 5A • Brand: Omron; • CoO: China 6. SIEMENS VFD (Variable-Frequency Drive) 	01 SET	


 Md. Alamgir Hossain
 Head of TVET Institute
 UCEP Mirpur TVET Institute


 SK. Tanzir Kamal
 Senior Officer F & A
 UCEP Dhaka North Region


 Md. Anowarul Islam
 Regional Manager
 UCEP Dhaka North Region

	<ul style="list-style-type: none"> • Input --- • Number of phases: 1 AC • Line voltage: 200 .. 240 VAC -15 % +10% • Line frequency: 47 ... 63 Hz • Output --- • Number of phases: 3 AC • Rated power: 0.37 kW • Efficiency η: 0.98 • Filter class (integrated) Unfiltered • Communication USS, Modbus RTU • Standard digital inputs: 4 • Digital outputs: 2 • Analog inputs: 2 • Analog outputs: 1 • Display for programming and monitoring • Brand: SIEMENS • CoO: China <p>7. SIMATIC S7-1200, Communication module CM 1241</p> <ul style="list-style-type: none"> • Communication module CM 1241, RS-485/USS • 9-pole D-sub (pin) • Supports Freeport • Brand: SIEMENS • CoO: China <p>8. RTD Module</p> <ul style="list-style-type: none"> • RTD INPUT, SB 1231 RTD, • 1 AI RTD • 1 CHANNEL • PT 100 OR PT1000 • Brand: SIEMENS • CoO: China <p>9. Analog Input/Output Module</p> <ul style="list-style-type: none"> • Analog inputs: 4 • Analog outputs: 2 <input type="checkbox"/> +/-10 V, 14-bit resolution or • 0/(4)-20mA, 13-bit resolution • Brand: SIEMENS • CoO: Germany <p>10. Induction Motor</p> <ul style="list-style-type: none"> • Power: 0.37 KW • Phase: 3-phase • Speed: 1450 rpm • Voltage: 400 • Mounting Type: FOOT • Brand: SMS or Equivalent • CoO: China <p>11. SENSORS</p> <ul style="list-style-type: none"> • Proximity sensor (capacitive, inductive, diffuse light sensor) 		 
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Md. Atamgir Hossain
Head of TVET Institute
UCEP Mirpur TVET Institute

SK. Tanvir Kamal
Senior Officer F & A
UCEP Dhaka North Region

Md. Anwarul Islam
Regional Manager
UCEP Dhaka North Region

1. Temperature sensor
2. Magnetic/limit switch

3. Wi-Fi Router
 - Model: RB941-2nD hAP-Lite
 - Chip Model: QCA9533 CPU
 - Nominal Frequency: 650 MHz
 - Standard Wireless: 2.4 GHz
 - 802.11b/g/n Capacity: Up to
 - 27Mbps Bandwidth Controller
 - Brand: MIKROTIK
 - CoO: LATVIA

4. CONTROL PANEL
 - Custom-Built PLC training panel
 - CoO: Local

5. ACCESSORIES
 - Terminal block, Relay, Fuse, Fuse terminal, Connector, Control Wire, Power wire, selector switch, push switch, Indicator lamp, Potentiometer, Banana Clip, Banana Jack, Timer, DP MCB etc.
 - CoO: Local

6. IoT Connectivity SERVER
 - Remote control and monitoring
 - Period: 12 months

7. TRAINING PERIOD
 - 22 Days

8. Training Experiments-
9. Use NO/NC contacts to energize a light, Application: Basic Electronics
10. Latching circuits using push buttons, Application: Basic PLC Program
11. Counter operations using push button, Application: Count operation
12. Timer operations using switches, Application: Timer operation
13. Sequential timer operations, Application: Sequence operation
14. Use sensors to generate outputs, Application: Sensor operation
15. Conditional motor operation program, Application: Manufacturing Industry
16. Packaging of Cubes Counter, Application: Manufacturing Industry
17. Package Sorting, Application: Food Industry
18. Automatic Car Parking System, Application: Car Parking
19. Water Tank Filling, Heating & Emptying, Application: Chemical Industry
20. Washing Machine Automation, Application: Textile Industry
21. Temperature Based Fan Controlling, Application:

Md. Alamgir Hossain
 Head of TVET Institute
 UCEP Mirpur TVET Institute


SK. Tanvir Kamal
 Senior Officer F & A
 UCEP Dhaka North Region

Md. Andwarul Islam
 Regional Manager
 UCEP Dhaka North Region

	<p>Food/Pharma Industry</p> <p>22. Automatic Watering System, Application: Agriculture Industry.</p> <p>23. Air Compressor Controlling, Application: Industry Utility</p> <p>24. Multiple Conveyor Sequential Controlling, Application: Cement Industry</p> <p>25. Water pH/DO Level Controlling, Application: Textile/Pharma Industry</p> <p>26. Booster Pump Automation, Application: Textile Industry</p> <p>27. Batch Mixing Automation, Application: Chemical Industry</p> <p>28. SCADA System Design for Monitoring and Controlling</p> <p>29. SCADA Based pH/DO Level Controlling & Data Logging</p> <p>30. SCADA Based Batch Mixing Automation & Recipe Management</p> <p>31. SCADA Based Batch Mixing Automation & Recipe Management</p> <p>32. SCADA & IoT-Based Remote Monitoring & Controlling System</p>		
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Md. Alamgir Hossain
Head of TVET Institute
UCEP Mirpur TVET Institute


SK. Tanzir Kamal
Senior Officer F & A
UCEP Dhaka North Region


Md. Anwarul Islam
Regional Manager
UCEP Dhaka North Region



List of Experiment For the PR Item no. 2 to 19.

1. Electrical Load Controlling (On-Off)
2. Timer Based Electrical Load Controlling
3. Temperature Measurement and Load Controlling
4. Product Counting
5. Speed Controlling of 3 ϕ Induction Motor
6. Observe the Operation of ATS
7. Motor Start & Stop by DOL Starter & PLC
8. Make a ATS with PLC
9. Motor Forward & Reverse Controlling by Forward Reverse Box
10. Motor Forward & Reverse Controlling by PLC
11. Observe Star-Delta Operation by Star – Delta Box & PLC
12. Soft Start & Soft Stop Operation of Motor
13. HMI Programming & Monitoring the System Output
14. PLC, HMI & VFD Communication and Make a few Project



Md. Alamgir Hossain
Head of TVET Institute
UCEP Mirpur TVET Institute



SK. Tanzir Kamal
Senior Officer F & A
UCEP Dhaka North Region



Md. Anwarul Islam
Regional Manager
UCEP Dhaka North Region

