



## Multi-State Advanced Manufacturing Consortium

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### MSAMC Master Performance Based Objectives (PBO) Review Template

#### Instructions

The following tab lists PBOs for the topic area **ControlLogix**. Please review each of the PBOs, and rate each PBO with one of the following ratings:

**1 = Skill or understanding is required for employees.**

**2 = Skill is useful, but is not crucial for employees.**

**3 = Skill is not useful for employees, or isn't relevant for typical work assignments.**

**0 = PBO is unclear.**

Additionally, for each PBO, note any comments or recommendations that you may have about how to improve the PBO. If any PBOs or skill sets seem to be missing from the list, please add them in the space at the bottom of the list.

#### Please enter your information below

Name:	
Company/Plant:	
Department/Division:	
Industry/Segment:	
Email:	
Phone:	

20150605\_pbo\_review\_ind\_controllogix

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## ControlLogix

### M-S AMC Industry Partner PBO Review

Please review the following PBOs to identify the appropriate skill set for a given job title / category / classification (see row 10 below).

\* In the "Importance" column, identify how important each PBO is for someone in the relevant position. For each PBO, type 1 if the PBO must be covered in the coursework, enter 2 if the PBO is helpful but not necessary and would not impair the performance of the employee in the workplace if missed, and enter 3 if the PBO would not benefit the student or doesn't apply to the typical work assignments. If you don't understand the PBO, enter 0.

\* Note any comments or feedback for improving each PBO (in the "Comments" column).

**Note: It is the intention of competency based instruction to have each student individually demonstrate their proficiency of the skills indicated.**

Reviewing PBOs for **TYPE JOB TITLE HERE** (from whose perspective are you rating PBO importance?)

Sub-Topic	Level	Topic	PBO ID	Performance Based Objective (PBO)	Importance, 1 = Need 2 = nice to have 3 = N/A 0 = Don't understand	Comments <i>Notes to improve the PBO, PBO is unclear, etc.</i>
	1	CL	1	Match the features of the following hardware to a given list. (Written exercise) - Processor module	Enter 1, 2, 3, or 0 here	
	1	CL	2	Using RSLogix software, setup the proper driver necessary to allow the PC to communicate the ControlLogix system.		
	1	CL	3	Using the RSLogix5000 software Communications menu, "Who Active", select a processor and initiate online communications.		
	1	CL	48	Demonstrate switching processor models both locally (key-switch) and remotely (terminal).		
	1	CL	5	Download and Upload programs to/from a ControlLogix processor.		
	1	CL	42	Given an I/O chassis, Input module, Output module, sensor & actuator, wire the proper I/O field wiring and create a ControlLogix routine necessary to exercise the I/O devices.		
	1	CL	10	Add storage bits to a ladder routine, cross-reference their location throughout the program, toggle bits on & off. Add software jumpers & rung output blocker bits.		
	1	CL	8	Apply and enable forces, find, remove, and disable forces.		
	1	CL	9	Perform minor edits on-line to the ladder logic to include relay, timer, and counter instructions.		
	1	CL	7	Create and save simple PLC programs (Simple Start (N.O.-PB) - stop circuit (N/C-PB) using storage bit tags and one output lamp.		
	1	CL	11	Access the Tag database viewer and interpret the information in the following areas – Input & output image tables, Timer and Counter areas (including modifications of the preset values).		
	1	CL	12	Switch the displayed "Style" (radix) while viewing data tags.		
	1	CL	15	Search a ladder diagram by tag address and instruction type. (Using "Search Next", "Search Previous", and "Find All").		
	1	CL	16	Add instruction and rung comments to a ladder diagram.		
	1	CL	17	Change the processor's mode of operation.		

<b>ControlLogix Level 1</b>	1	CL	18	Perform Searches using the cross-references function.		
	1	CL	19	Using the ControlLogix reference material, identify all indicators on a ControlLogix Processor module, determine whether the indicator represents normal or a faulted condition and identify the recommended recovery action for each possible condition.		
	1	CL	20	Using the ControlLogix reference material, identify all indicators on I/O modules, determine whether the indicator represents normal or a faulted condition and identify the recommended recovery action for each possible condition.		
	1	CL	21	Construct a simple clamp and drill circuit, program and debug. This will be completed on pneumatic actuated lab stations. (Note the program will be given to the students with one logic error in the program. The students are to debug the program. The circuit will demonstrate anti-tie down and pinch point control).		
	1	CL	22	Given a ladder listing and input conditions, predict the output status. This ladder listing will include the following instruction types: XIC, XIO, OTE, OTL, OUT, TON, TOF, RTO, CTU, CTD, RES, MOV, COP, MVM, EQU, GEQ, GRT, LEQ, LES, LIM, MEQ, NEQ, SQO, JMP, LBL, JSR, SBR, MCR, ONS		
	1	CL	23	Identify what appears to be program anomalies when the program is running with Program Control Instructions (i.e. MCR, JMP, and LBL).		
	1	CL	25	While viewing the ladder listing of an operating program, search for the output that the simulated machine is waiting for and identify the inhibitors to machine operation. Trace these inhibitors back to real world inputs.		
	1	CL	26	Given the RXlogix5000 ladder logic display, input and output module indicator conditions, and the associated voltage measurements that would be measured in the control panel, determine whether a failed input or output condition is due to a processor error "or" the input/output interfaces "or" a real world device/wiring issue.		
	1	CL	27	Perform the replacement procedure of the following modules: a. Processor module b. Ethernet Communications module c. Input module d. Output module		
	1	CL	41	Using the RSLogix5000 software, reset electronic fuses on the 1756-OAD module.		
	1	CL	6	Using the RSLogix5000 software, use the I/O Configuration folder in the Controller Organizer to display specific module properties.		
	1	CL	4	Create a new ControlLogix project by configuring all module properties including requested packet interval, and electronic keying.		
	1	CL	43	Troubleshoot faulty machine operation on training simulator with instructor induced faults.		

<b>ControlLogix Level 2</b>	2	CL	13	Create a User-defined Data Type, and write a program using the UDT.		
	2	CL	24	The student will load a bit pattern into the Tag database and control real world outputs with this bit pattern using Move and Sequencer (SQO) instructions.		
	2	CL	28	Using the RSLogix5000 software, review plant standard tasks, programs, routines, instructions, I/O configuration, and User-defined Data Types. Evaluate the logic and create Rung comments that would describe the action of the rung.		
	2	CL	31	Given a ladder listing and input conditions, predict the output status. This ladder listing will include the following instruction types: MVM, JSR (with and without parameters), SBR, FAL, CPT, CMP, GSV, SSV		
	2	CL	29	Using the RSLogix5000 software, create a trend chart.		
	2	CL	50	Wire, program, and demonstrate the use of analog inputs and outputs.		
	2	CL	51	Identify produced and consumed tags in the controller tag listing.		
	2	CL	45	Analyze plant working drawings (prints) and identify power distribution, used components (panel layout), and I/O wiring.		
	2	CL	46	Using plant programs, determine which programming elements are and are not used.		
	2	CL	47	Using plant programs, identify the organization of the program and determine if program tags and UDTs are used.		
<b>DeviceNet</b>	2	CL	49	3 cascaded timers are to be used to control a process. Using two selector switches (or four push buttons) select one of four recipes (presets) stored in an array to change the timers.		
	3	CL	32	Install DeviceNet hardware including cables, T-taps, power supplies, terminators, nodes, scanner module. Using RSNetWorx for DeviceNet software, configure the module with a scan list and node map. Write logic using the I/O on the DeviceNet network. Note: Apply DeviceNet wiring standards related to baud rate, trunk & drop cable lengths, thick & thin cable installations, ampere load limits, termination, refresh power, shielding, etc.		
	3	CL	33	Interpret diagnostic indicators on common Devicenet I/O nodes, identifying the corrective action to be taken if a fault is indicated.		
	3	CL	34	Identify & interpret diagnostic indicators on a DeviceNet Bridge Module, identifying the corrective action to be taken if a fault is indicated.		
	3	CL	35	Using the RSNetWorx for DeviceNet software, go On-line to a DeviceNet Bridge module and display a graphical view of the network for node status.		
	3	CL	36	Using the RSNetWorx for DeviceNet software, view specific active node parameters.		
	3	CL	37	Using the RSNetWorx for DeviceNet software, view the scan list for actively scanned nodes and specific node mapping.		

	3	CL	38	Using the RSNetWorx for DeviceNet software, commission a new node by adding it to an existing network, and mapping its address in the scanner module.		
	3	CL	39	Using the RSNetWorx for DeviceNet software, print to a file a list of all network nodes with their respective mapping and parameters.		
	3	CL	40	Using the RSNetWorx for DeviceNet software, save & restore a scan list file to/from the DNB module.		
	3	CL	44	Perform the replacement procedure of the following modules: a. DeviceNet Communications module b. DeviceNet Input Node c. DeviceNet Output Node		
Ethernet	3	CL	14	Install and configure an Ethernet Communications Module. Interpret diagnostic indicators status related to the modules functionality.		
	3	CL	30	Using the RSLogix5000 software and two controllers, create and program Producer/Consumer tags to interlock the two controllers over Ethernet.		

**Additions: Please add any additional objectives that we may have overlooked.**

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