Certification Test

CT.MotionWorksIEC.01.eLM.MWiec3.CertificationTest

Student Name: _____

Company Name: _____

Address: _____

Phone: _____

Email: _____

Test Date: _____

Answers:

1	26	51	76	101
2	27	52	77	102
3	28	53	78	103
4	29	54	79	104
5	30	55	80	105
6	31	56	81	106
7	32	57	82	107
8	33	58	83	108
9	34	59	84	109
10	35	60	85	110
11	36	61	86	111
12	37	62	87	112
13	38	63	88	113
14	39	64	89	
15	40	65	90	
16	41	66	91	
17	42	67	92	
18	43	68	93	
19	44	69	94	
20	45	70	95	
21	46	71	96	
22	47	72	97	
23	48	73	98	
24	49	74	99	
25	50	75	100	

Taking the Test

- The purpose of this test is to validate the learning experience corresponding to the applicable eLearning Module.
- The test is open book. You may use any website, manuals, software, demo, etc. The test must be taken individually; you may not contact another person for help.
- Each question has only one correct answer unless otherwise noted. Please clearly record all answers on the answer sheet. All questions are equally weighted. A passing score is 90%.
- It is recommended to preview the questions before viewing the module, and answer them as the module progresses.
- This test applies to the following eLearning modules. These videos may be viewed at https://www.youtube.com/playlist?list=PLNAENlyEDCkyqEthP3ahIzfOGqoRxnrWM

1. eLM.MotionworksIEC.01.MWiec3_VIPA_CFG
2. eLM.MotionworksIEC.02.MWiec3_LGCANLYZ
3. eLM.MotionworksIEC.03.MWiec3_MP3000
4. eLM.MotionworksIEC.04.MWiec3_PLCOPN4
5. eLM.MotionworksIEC.05.MWiec3_SimAxis
6. eLM.MotionworksIEC.06.MWiec3_MCE_BAS
7. eLM.MotionworksIEC.07.MWiec3_MCE_GEN
8. eLM.MotionworksIEC.08.MWiec3_MCE_BLND
9. eLM.MotionworksIEC.09.MWiec3_MCE_SS
10. eLM.MotionworksIEC.10.MWiec3_HMI_TAG
11. eLM.MotionWorksIEC.12.MWiec3_MULTIRST
12. eLM.MotionWorksIEC.13.MWiec3_Optimize
13. eLM.MotionWorksIEC.14.MWiec3_SWp7
14. eLM.MotionWorksIEC.15.MWiec3_Mech
15. eLM.MotionWorksIEC.16.MWiec3_MltRsrce
16. eLM.MotionWorksIEC.17.MWiec3_FBupdate
17. eLM.MotionWorksIEC.18.MWiec3_CR_IMPROV
18. eLM.MotionWorksIEC.25_MWIEC3_PCS
19. eLM.MotionWorksIEC.26.MWiec3_CBTrack
20. eLM.MotionWorksIEC.27.MWIEC3_IZone
21. eLM.MotionWorksIEC.28.MWIEC3_Smooth
22. eLM.MotionWorksIEC.29.MWIEC3_PTgroup
23. eLM.MotionWorksIEC.30.MWIEC3_TanAux
24. eLM.MotionWorksIEC.31.MWIEC3_UserLib
25. eLM.MotionWorksIEC.32.MWIEC3_Startup
26. eLM.MotionWorksIEC.33.MWIEC3_PTcont
27. eLM.MotionWorksIEC.34.MWIEC3_PTmwiec
28. eLM.MotionWorksIEC.35.MWIEC3_PThc

Returning the Test

- Please return **only the first page** of the test (the answer sheet) with completed answers and contact information.
- e-mail a scan, photo, or edited pdf of the answer sheet with all answers and contact information to **training@yaskawa.com**.

Receiving Your Score

You may review your answers only if a passing score is received. You will receive a system-generated email with your score. Please allow up to 5 business days.

Yaskawa SLIO *(eLM.MotionWorksIEC.01.MWiec3_VIPA_CFG)*

1. What is the function of the Load Factor?

   A. Live online monitor of the current draw
   B. Estimation of the current draw
   C. Calculation of worst-case current draw

2. How are the slice parameters saved in the MotionWorks IEC project when using the Ethernet/IP SLIO interface module?
   A. Included in hardware configuration
   B. Written with function blocks

3. How are IO addresses determined when (assume the Ethernet/IP SLIO interface module)?
   A. The addresses are set by hardware configuration
   B. The addresses are copied from the SLIO Web UI
   C. The addresses are imported using function blocks

4. What is the maximum number of inputs or outputs available on a slice?
   A. 2
   B. 4
   C. 8
   D. 12
   E. 16

5. Which SLIO interface module protocol supported in MotionWorks IEC Hardware Configuration is appropriate for time-critical IO?
   A. Modbus TCP/IP
   B. ProfiNet
   C. EtherNet/IP
   D. DeviceNet
   E. MECHATROLINK-III
   F. CANopen
   G. All of the above
   H. Answers A and B only
   I. Answers C and E only

Logic Analyzer _(eLM.MotionWorksIEC.02.MWiec3_LGCANLYZ)_

6. When using Logic Analyzer, why is it important to know the setting of the task interval?
   A. To set the trigger configuration sample time
   B. To read the cursor measurement data
   C. To read the Duration axis data

7. What unit of measurement is used by default on the horizontal axis in Logic Analyzer?
   A. Seconds
   B. Application Scans
   C. Samples
   D. Milliseconds

8. How many cursors can be displayed simultaneously in Logic Analyzer
   A. 1
   B. 2
   C. 3
   D. 4

9. Which mouse buttons are used to zoom in on the trace?
   A. Left
   B. Right
   C. Left and Right
   D. Middle
   E. Scroll wheel

10. Which operations are possible in Logic Analyzer?
    A. Save and Load zoom settings
    B. Save and load curves
    C. Save and load triggers
    D. Save and load cursors
    E. Both B and C
    F. Both A and D

MP3300iec Series Networking *(eLM.MotionWorksIEC.03.MWiec3_MP3000)*

11. What is the maximum number of bytes in an Ethernet/IP instance in the MP3300iec?
    A. 128
    B. 256
    C. 496
    D. 512

12. How many EtherNet/IP adapters can be connected to one MP3000iec series controller?
    A. 50
    B. 100
    C. 128
    D. 256

13. What is the benefit of %M bidirectional holding registers when the MPiec controller is used as a Modbus/TCP slave?
    A. The function code sizes are increased
    B. The network speed and number of adapters is increased
    C. Uses less memory and less programming

14. A controller is sending the integer data “1234” over Ethernet/IP to another device, but that device reads “-11772”. What might be necessary?
    A. Use the %M registers for Ethernet/IP data
    B. Use the Endian conversion functions
    C. Add another Ethernet/IP Instance
    D. Configure the controller as an Ethernet/IP scanner instead of adapter

PLCopen Part 4 *(eLM.MotionWorksIEC.04.MWiec3_PLCOPN4)*

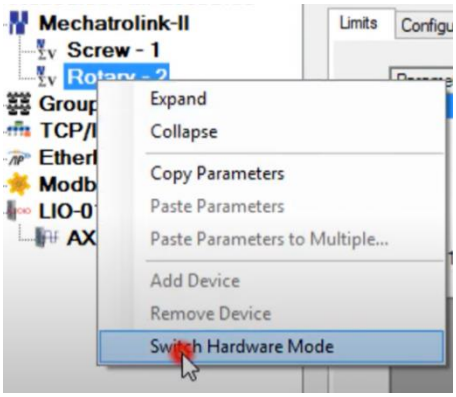
15. What does the PLCopen Part 4 standard define?
    A. Single Axis Motion Control
    B. User Guidelines for PLC Programming
    C. Coordinated Multi-Axis Motion
    D. Homing Procedures

16. What part of MotionWorks IEC is used to assign specific axes to a multi-axis mechanism?
    A. Global Variables
    B. Hardware Configuration
    C. I/O Configuration
    D. Web UI
    E. Local Variables Worksheet

17. Which coordinate system has a fixed origin at the base of the mechanism?
    A. Tool coordinate system (TCS)
    B. Axis coordinate system (ACS)
    C. World coordinate system (WCS)
    D. Machine coordinate system (MCS)

18. Which type of coordinated move commands a multi-axis mechanism to move as an arc between two points?
    A. Linear
    B. Blended
    C. Circular
    D. Direct
    E. Intermediate

Simulated Axis
(eLM.MotionWorksIEC.05.MWiec3_SimAxis)



19. What is the purpose of Switch Hardware Mode?
    A. To run the MECHATROLINK axis as a virtual axis without hardware
    B. To accomplish servo positioning with a variable frequency drive
    C. To increase the number of axes without additional hardware requirements
    D. All of the above

20. What is the advantage of Switch Hardware Mode compared to virtual axis?
    A. All MECHATROLINK parameters are retained
    B. Minimal programming and configuration changes
    C. All of the above

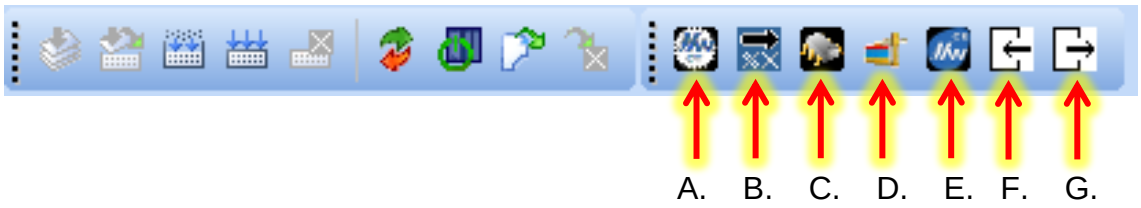
21. Which area within MotionWorks IEC is used to switch the axis hardware mode?
    A. Hardware Configuration
    B. Initialize POU
    C. Global Variables
    D. Resource Dialog
    E. All of the above

22. Which of the following is NOT supported when an axis is simulated?
    A. Speed Control
    B. Position Control
    C. I/O
    D. Position Feedback
    E. All of the above

Cam Editor – Basics *(eLM.MotionWorksIEC.06.MWiec3_MCE_BAS)*

23. Which function block moves the cam table from the CSV file into the controller RAM?
    A. CamGenerator
    B. Y_CamStructSelect
    C. Y_CamFileSelect
    D. Y_CamIn

24. Which button launches Cam Editor?



25. What slave data can be seen on the left side of the Cam Editor
    A. Slave position
    B. Slave Velocity
    C. Slave Acceleration
    D. Slave Jerk
    E. A,B,D
    F. A,B,C
    G. All of the above

26. A lower value in the Resolution column results in..
    A. More master-slave points
    B. Fewer master-slave points
    C. No effect on the master-slave points

Row	Master	Slave	Curve Type	Resolution
0	0	0		
1	90	180	Modified Trapezoid	.5
2	180	180	Straight Line	0
3	360	0	Parabolic Velocity Blend	.1
4				

Cam Editor – Cam Generator *(eLM.MotionWorksIEC.07.MWiec3_MCE_GEN)*

27. How can variables from the code be imported into Cam Editor?
    A. Use the Export variables to HMI button in Hardware Configuration
    B. Import from a CSV file using the CSV button in Cam Editor
    C. Paste from a structured text program and use Convert ST Code

28. What is the purpose of the CamGenerator function block?
    A. Calculates a cam table structure from several cam segments
    B. Generates motion in the servo motor based on a cam table
    C. Outputs a CSV file or structure for import into Cam Editor
    D. Moves the cam table from the CSV file into the controller RAM?

29. What type of data can be entered in Cam Editor for Master, Slave, and Resolution in the Cam Segment Table tab?
    A. Numeric Values
    B. Variables
    C. Mathematical Expressions
    D. All of the above
    E. Answers A and B only

Cam Editor – Cam Blend *(eLM.MotionWorksIEC.08.MWiec3_MCE_BLND)*

30. Which cam profiles are required to use CamBlend?
    A. Start, End
    B. Ramp In, Ramp Out
    C. Ramp In, Running, Ramp Out
    D. Start, Running, End

31. How many cam table IDs are required by the CamBlend Function Block?
    A. 2
    B. 3
    C. 4
    D. 7

32. What function block controls the transition between the Blend profiles?
    A. CamBlend
    B. CamIn
    C. CamGenerator
    D. Y_CamStructSelect

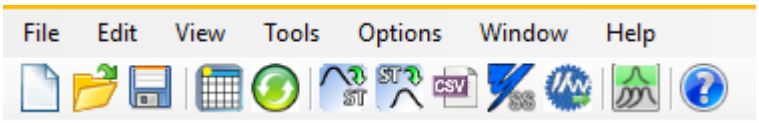
33. What type of application can benefit the most from CamBlend?
    A. Point-to-Point Positioning
    B. Multi-axis Coordinated Motion
    C. Linear Flying Shear
    D. Rotary Knife

Cam Editor – Cam Sigma Select *(eLM.MotionWorksIEC.09.MWiec3_MCE_SS)*

34. What methods can be used to model the motion profile with Yaskawa's Sigma Select servo sizing software?
    A. The built-in profile editor
    B. A CSV file
    C. Active Cam Editor project
    D. All of the above
    E. A and C only

35. What is the benefit of using Cam Editor with Sigma Select servo sizing software?
    A. Complex motion profiles can be accurately modeled for motor sizing
    B. Sigma Select can be used to create cam profiles for motion programming
    C. Variables from Sigma Select can be used in Cam Editor

36. In Sigma Select, the "Connect to CamEditor" button is active. What button in Cam Editor links it to Sigma Select?



A. B. C. D.

HMI Tag Import/Export *(eLM.MotionworksIEC.10.MWiec3_HMI_TAG)*

37. What does the result of pressing the “Export MWIEC Variables to HMI Tags” button?
    A. Sends the Modbus/TCP tags directly to the HMI
    B. Creates a CSV file that can be imported to the HMI
    C. Exports the Modbus/TCP settings from Hardware configuration
    D. Reads the HMI tags into MotionWorks IEC.

38. Where in MotionWorks IEC are the supported HMI export formats listed?
    A. Global Variables
    B. WebUI
    C. Hardware Configuration
    D. I/O Configuration

39. Which menu button listed initiates “Export MWIEC Variables to HMI Tags”?
    A. 
    B. 
    C. 
    D. 

Multi-Turn Reset *(eLM.MotionWorksIEC.12.MWiec3_MULTIRST)*

40. In what circumstances can the alarm A.CC0(multi turn limit disagreement) occur?
    A. When the machine is first deployed
    B. After motor replacement
    C. When encoder cable is disconnected
    D. All of the above
    E. Answers A and B only

41. What is the meaning of the alarm A.CC0 (multi turn limit disagreement)?
    A. All the power supplies for the absolute encoder have failed
    B. The connection between the amplifier and the command option module is faulty
    C. Data in the encoder does not match what is in the amplifier
    D. The amplifier and motor capacities do not match

42. Which button in MotionWorks IEC Hardware Configuration resets the Multi-turn limit in the encoder?

A. 

B. 

C. 

D. 

Optimize Axis *(eLM.MotionWorksIEC.13.MWiec3_Optimize)*

43. To use the Optimize Axis button, first navigate to the _____ (choose the best answer).
    A. Hardware Configuration
    B. Project Tree
    C. Edit Wizard
    D. Web UI
    E. SigmaWin+ ver7

44. It is recommended to use the Optimize Axis button for which servo axes?
    A. No servo axes
    B. All existing servo axes already operating in the field
    C. Every newly commissioned servo axis
    D. Only axes that require high performance
    E. Only axes that do not require servo tuning

45. Which SigmaWin trace corresponds to an axis to which Optimize Axis has been applied?
    A. Figure 1
    B. Figure 2

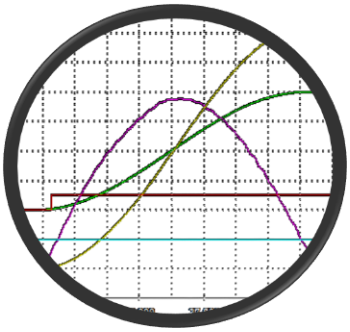


Figure 1

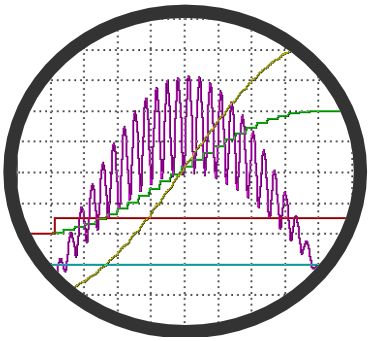


Figure 2

SigmaWin+7 with Controller _(eLM.MotionWorksIEC.14.MWiec3_SWp7)_

46. Which of the following controller products support connection of SigmaWin+7 to the Servopacks through the MPiec controller?
    A. Sigma-7Siec, firmware ≥ 3.3
    B. MP3300iec, firmware ≥ 3.2
    C. MP2310iec, firmware ≥ 3.2
    D. MP3200iec, firmware ≥ 3.3
    E. All of the above

47. What connection method is selected in SigmaWin+7 in order to connect to the Servopacks through the MP3300iec?
    A. USB Connection
    B. Ethernet Connection
    C. Controller Connection
    D. PCI/PCe Connection
    E. Remote PCI/PCe Connection
    F. MECHATROLINK Relay Device

48. An MP3300iec controller is connected by MECHATROLINK-III to four (4) Servopacks. SigmaWin+7 is used to connect the Servopacks through the controller. How many Servopacks can be monitored at once?
    A. 1
    B. 2
    C. 3
    D. 4

MECHATROLINK Mechanisms *(eLM.MotionWorksIEC.15.MWiec3_Mech)*

49. Which types of multi-axis mechanisms can the MP3000iec controllers operate using MECHATROLINK servos, when the kinematic equations exist at the MPiec firmware level? *(Assume firmware version 3.7.)*
    A. Gantry
    B. H-Bot & T-Bot
    C. SCARA
    D. Delta Robot
    E. GP8 6-axis articulated robot arm
    F. Answers A, B and C
    G. Answers A, B, C, and D
    H. All of the above

50. What is the **minimum** number of servo axes that exist in a Delta Robot mechanism supported by MECHATROLINK groups? *(Assume kinematic equations at firmware level, firmware version 3.7)*
    A. 2
    B. 3
    C. 4
    D. 5
    E. 6

51. How many belts exist in a T-Bot or H-Bot?
    A. 1 belt
    B. 2 belts
    C. 3 belts
    D. No belts

52. Where do the kinematic equations reside if the MP3000iec controls a custom multi-axis mechanism?
    A. MPiec Application Code
    B. External Controller
    C. MPiec Firmware
    D. Servopack

Multi Resource *(eLM.MotionWorksIEC.16.MWiec3_MltRsrce)*

53. A machine uses four (4) M3300iec controllers and thirty-three (33) Servopacks. What is the minimum number of MotionWorks IEC 3 projects required?
    A. 1
    B. 2
    C. 3
    D. 4
54. To add a controller to the project, first navigate to the _____ (choose the best answer).
    A. Hardware Configuration
    B. Project Tree
    C. Edit Wizard
    D. Web UI
    E. SigmaWin+ ver7

55. What is true about a project with multiple controllers?
    A. A task from one controller can be used in another controller
    B. A program instance from one controller can be used in another
    C. A global variable from one controller can be used in another
    D. Answers A and B only
    E. Answers B and C only
    F. Answers A and C only
    G. All answers, A, B and C

Programming Tips – 1 *(eLM.MotionWorksIEC.17.MWiec3_FBupdate)*

56. Troubleshooting a custom machine condition such as “Low Material” can be accomplished in the application code by recording a text string in the Web UI using which function block?
    A. Y_DebugPrint
    B. YDeviceComm
    C. Debugging Output
    D. MC_GroupReadStatus

57. What is the function of Y_BrakeRelease?
    A. Release all holding brakes for a group while “Servo On”
    B. Release all holding brakes for a group without “Servo On”
    C. Release the holding brake for one axis while “Servo On”
    D. Release the holding brake for one axis without “Servo On”

58. Winding applications can benefit from which of the following modes?
    A. Y_ControlMode#VelocityTrqFFMode
    B. Y_ControlMode#PositionTrqFFMode
    C. Y_EngageMethod#AtAbsolutePosition

Cross Reference Improvements *(eLM.MotionWorksIEC.18.MWiec3_CR_IMPROV)*

59. Why use the single variable lookup function?
    A. Simpler than using the Cross-Reference window
    B. Is quicker because it does not need to build a full Cross-Reference list
    C. Cross–Reference lists don't search local variable lists
    D. A,C
    E. A,B
    F. All of the above

60. What actions can be performed by the navigation keys?
    A. Cycle backwards or forwards through the worksheets
    B. Trace or retrace where the user's cursor has been
    C. In debug mode it resets or restores the previous action
    D. User can navigate through the toolbox projects

61. What does "refactor" do to a global variable?
    A. Break a structure into individual components
    B. Break an array into individual elements
    C. Rename the variable throughout the project

Part Coordinate System *(eLM.MotionWorksIEC.25.MWIEC3_PCS)*

62. Where is the origin located for a PCS move?
    A. In the base of the robot
    B. At a convenient location on the part
    C. At the tool center point
    D. All of the above

63. What is the reference coordinate system for the PCS offset?
    A. MCS
    B. ACS
    C. PCS
    D. TCS
    E. WCS

64. Which are benefits of programming with PCS moves
    A. More convenient for position calculations than the MCS
    B. Easily adjustable for variations in part position
    C. Same position sequence applies between different mechanisms
    D. All of the above
    E. Answers A & B only
    F. Answers B & C only

65. Which steps are involved to **determine** what the PCS offset should be for a given part?
    A. Calculate the MCS position in world coordinates
    B. Use the Y_GroupSetFrameOffset function block
    C. Teach 3 positions on the part
    D. Use the FrameTypeTransform function block
    E. All of the above
    F. Answers A & B only
    G. Answers B & C only
    H. Answers C & D only

66. Which steps are involved to **apply** the PCS offset once it is calculated?
    A. Calculate the MCS position in world coordinates
    B. Use the Y_GroupSetFrameOffset function block
    C. Teach 3 positions on the part
    D. Use the FrameTypeTransform function block
    E. All of the above
    F. Answers A & B only
    G. Answers B & C only
    H. Answers C & D only

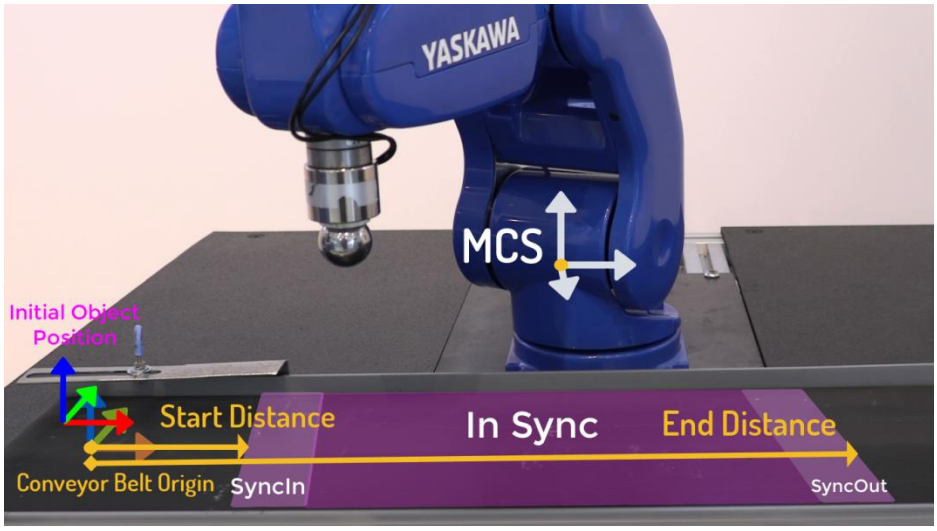
Conveyor Tracking *(eLM.MotionWorksIEC.26.MWIEC3_CBTrack)*

67. In addition to the MPiec controller and the multi-axis mechanism it controls, which physical components comprise a valid system capable of conveyor tracking?
    A. [Servo-Driven Conveyor] + [Vision System]
    B. [Servo-Driven Conveyor] + [Product Sensor]
    C. [External Encoder On Conveyor] + [Vision System]
    D. [External Encoder On Conveyor] + [Product Sensor]
    E. All of the above
    F. Answers A & C only
    G. Answers A & B only

68. What coordinate frame is required to command moves while tracking remains active?
    A. MCS
    B. ACS
    C. PCS
    D. TCS
    E. WCS

69. Which device provides the IOP (Initial Object Position) data to the MPiec controller?
    A. External Encoder on Conveyor
    B. Vision System
    C. Product Sensor
    D. All of the above

70. Which point is established as a fixed vector offset from the machine origin (MCS)?
    A. Initial Object Position
    B. Conveyor Belt Origin
    C. Start Distance
    D. End Distance



Interference Zones *(eLM.MotionWorksIEC.27.MWIEC3_IZone)*

71. Which coordinate systems can be used to define the boundaries of the cuboid interference zone?
    A. MCS
    B. PCS
    C. WCS
    D. TCS
    E. ACS
    F. All of the above
    G. A, B and C only
    H. D and E only

72. Entry into the interference zone of which of the following is detected?
    A. Any moving part of the mechanism
    B. The tool moved by the mechanism
    C. The TCP moved by the mechanism
    D. All of the above

73. Which are proper uses of interference zones?
    A. Prevent mechanism collisions
    B. Improve programming sequences
    C. Satisfy safety certification
    D. All of the above
    E. A and B only
    F. B and C only

74. What function block is used for interference zones in MotionWorks IEC?
    A. MLX_RobotSetIZTwoCorner
    B. Y_ActivateIZ
    C. MLX_SetIZ
    D. IZViolated

75. What response can automatically result when the interference zone is violated?
    A. Abort motion
    B. Redirect motion around the zone
    C. Return to original position
    D. All of the above

Smooth Multi-Axis Coordinated Motion _(eLM.MotionWorksIEC.28.MWIEC3_Smooth)_

76. What transition mode applies to 6-axis articulated robots controlled over Ethernet IP (such as YRC1000)
    A. TMConstantVelocity
    B. TMCornerDistance
    C. TMMaxCornerDeviation
    D. TMMaxCornerDistance
    E. TMMLXBlend

77. What application benefits from the TCP S-Curve Filter?
    A. 3D Printer
    B. Pick and Place
    C. Shape Cutting
    D. Welding

78. What coordinate systems can be used with s-curve?
    A. Axis Coordinate System (ACS)
    B. Machine Coordinate System (MCS)
    C. Part Coordinate System (PCS)
    D. World Coordinate System (WCS)
    E. A,B,C
    F. B,C,D

79. An application requires many short segments for a custom path, but the TCP must accelerate smoothly over an extended distance. What feature allows this?
    A. Collinearity Threshold
    B. Path Mode
    C. S-Curve
    D. Transition Mode

80. What application benefits from the Collinearity Threshold feature?
    A. Assembly
    B. Packing
    C. Part Sorting
    D. Shape Cutting

Programming Tips - Groups *(eLM.MotionWorksIEC.29.MWIEC3_PTgroup)*

81. What function block can be used to detect whether a group is moving with synchronized, discrete, or continuous motion?
    A. MC_GroupReadStatus
    B. Y_GroupReadVectorParam
    C. MC_GroupSetOverride

82. The TCP of a group is in motion. Motion must be paused in order to troubleshoot part of the machine. When finished, the machine must complete the original motion. What feature is appropriate?
    A. MC_GroupInterrupt
    B. MC_GroupContinue
    C. MC_GroupSetOverride
    D. All of the above
    E. Answers A and B only
    F. Answers B and C only

83. A robot should run at 50% normal speed for troubleshooting purposes. What function block is appropriate?
    A. MC_GroupSetOverride
    B. MC_GroupContinue
    C. Y_GroupReadVectorParam
    D. All of the above

84. What function block gives the programmer access to information such as Group Feedrate Override?
    A. Y_GroupReadParameter
    B. MC_GroupReadStatus
    C. MC_ReadParameter

Tangent Following and Aux Axis *(eLM.MotionWorksIEC.30.MWIEC3_TanAux)*

85. Which function block is used to control the Tangent Axis?
    A. Y_SyncTangentAxisToGroup
    B. MC_MoveAbsolute
    C. MC_MoveCircularAbsolute
    D. MC_MoveLinearAbsolute

86. Which application(s) would benefit from using an auxiliary axis?
    A. 3D printer Extruder
    B. Spindle
    C. Wire Feed Welder
    D. Glass Cutter
    E. A, C
    F. A, D
    G. C, D

87. Which type of axis receives position command through the group vector?
    A. Aux
    B. Tangent

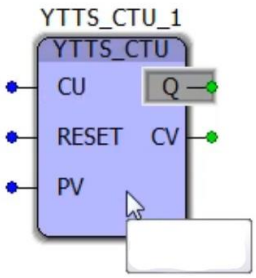
88. Tangent axis can operate on which of the following mechanisms?
    A. XY or XYZ Gantry
    B. YRC1000 with MotoMini
    C. Custom Delta Robot
    D. H-Bot, T-bot, Core-XY
    E. SCARA
    F. All of the above

User Libraries *(eLM.MotionWorksIEC.31.MWIEC3_UserLib)*

89. Why is it important to know the version number of a user library?
    A. So that each project can be automatically updated to the latest version
    B. So that each project can use the version for which it was designed

90. What actions can change library compile order?
    A. Drag and drop libraries
    B. Save in Hardware Configuration
    C. Make Dependencies
    D. All of the above
    E. Answers A and B only

91. What information is displayed in the tooltip when holding the mouse over the body of a function block from a user library?
    A. Name of user library
    B. Version of release
    C. Date of release
    D. Author of library
    E. All of the above
    F. Answers A and B only



92. What feature allows the programmer to lock a project to prevent unintentional edits?
    A. Released
    B. Version
    C. Dependency

93. What feature allows the programmer to compile the libraries and the project at once?
    A. Make
    B. Make Dependencies
    C. Rebuild Project
    D. Download Changes

Controller Startup Options *(eLM.MotionWorksIEC.32.MWIEC3_Startup)*

94. What data can be backed up and restored using the archive?
    A. Program
    B. Configuration
    C. Servo Parameters
    D. IP address
    E. Data of variables marked “Retain”
    F. All of the above
    G. Answers A, B, C & D
    H. Answers A, B, C & E

95. What data can be backed up and restored from the SRAM?
    A. Program
    B. Configuration
    C. Servo Parameters
    D. IP address
    E. Data of variables marked “Retain”
    F. All of the above
    G. Answers D & E

96. Under what conditions is the controller IP address overwritten at reboot by data in the archive?
    A. When the file Network.xml exists in the archive
    B. When the file AutoColdBoot.xml exists in the archive
    C. When the IP address is at default
    D. When the hardware configuration is saved online

97. Which of the following occur during warm start?
    A. Variables marked retain are set to the initial value
    B. Variables NOT marked retain are set to the initial value
    C. The warm start task runs
    D. The cold start task runs
    E. All of the above
    F. Answers A, B & C
    G. Answers B & C

98. If a controller (firmware 3.7+) cannot boot with warm start, under what conditions will it automatically boot with cold start?
    A. When the file Network.xml exists in the archive
    B. When the file AutoColdBoot.xml exists in the archive
    C. When the data of variables marked “Retain” are restored
    D. All of the above

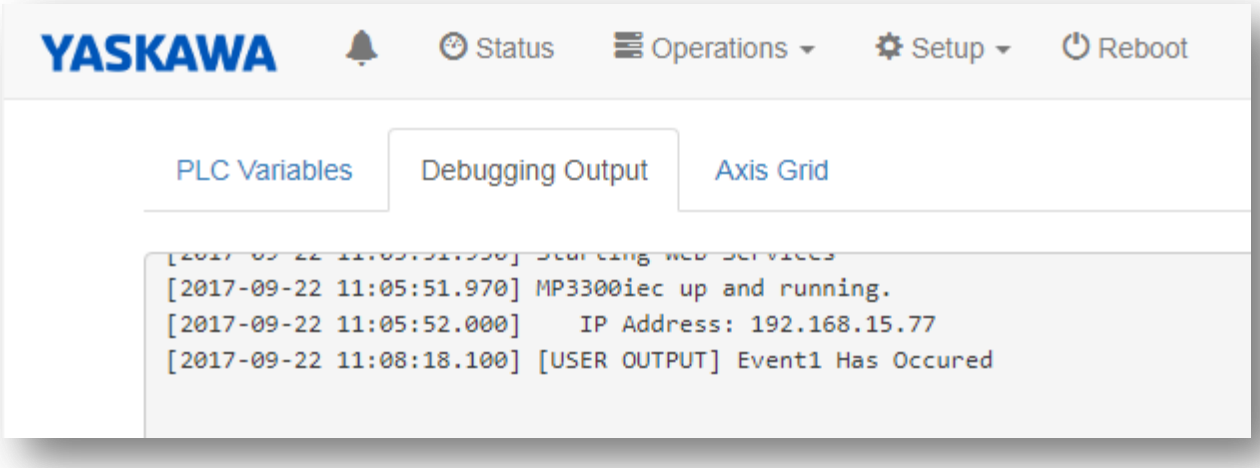
99. An application contains unique calibration data stored in retain variables. What is the recommended method for cold start?
    A. Automatic Cold Start
    B. Manual Cold Start

Programming Tips - Controller *(eLM.MotionWorksIEC.33.MWIEC3_PTcont)*

100. The programmer would like the IEC code to verify the controller firmware level before initiating motion. What feature is required?
   A. Controller [CONTROLLER_INFO] system variable
   B. Y_PostUserAlarm function block
   C. Y_DebugPrint function block
   D. Y_Write7LEDMessage function block
   E. Y_GetAlarmDesc function block

101. When a variable reaches a threshold level, the programmer would like the controller to enter the alarm state and record the event in alarm history. What feature is required?
   A. Controller [CONTROLLER_INFO] system variable
   B. Y_PostUserAlarm function block
   C. Y_DebugPrint function block
   D. Y_Write7LEDMessage function block
   E. Y_GetAlarmDesc function block

102. The programmer would like a specific event to be silently logged in the Web UI without entering an alarm state. What feature is required?



   A. Controller [CONTROLLER_INFO] system variable
   B. Y_PostUserAlarm function block
   C. Y_DebugPrint function block
   D. Y_Write7LEDMessage function block
   E. Y_GetAlarmDesc function block

103. The programmer would like a custom message to scroll on the front panel display of the MP3300iec controlle. What feature is required?
   A. Controller [CONTROLLER_INFO] system variable
   B. Y_PostUserAlarm function block
   C. Y_DebugPrint function block
   D. Y_Write7LEDMessage function block
   E. Y_GetAlarmDesc function block

104. The programmer would like to send alarm codes and descriptions to the HMI as text strings without importing a table of alarm codes to the HMI. What feature is required?
   A. Controller [CONTROLLER_INFO] system variable
   B. Y_PostUserAlarm function block
   C. Y_DebugPrint function block
   D. Y_Write7LEDMessage function block
   E. Y_GetAlarmDesc function block

Programming Tips – Editor (*eLM.MotionWorksIEC.34.MWIEC3_PTmwiec)*

105. What feature can be used to transfer a POU from an existing project to a new project?
   A. Copy/Paste
   B. Export/Import
   C. Insert Code Worksheet
   D. Compile Unused POUs
   E. All of the above
   F. Answers A and B only
   G. Answers B and C only

106. The programmer has transferred a logical POU from one project to another. What elements are included?
   A. Datatype Definitions
   B. User Libraries
   C. VAR_GLOBAL variables
   D. VAR variables
   E. VAR_EXTERNAL variables
   F. All of the above

107. What methods can be used to adjust the value that a global variable (with a structure datatype) will have immediately after cold start?
   A. Create Global Variables from Externals
   B. Initialize Multi-Element Variables
   C. Structured Text code worksheet
   D. Project Events Log
   E. All of the above
   F. Answers A and B only
   G. Answers B and C only
   H. Answers C and D only

108. The programmer would like to have partially completed sample code for reference in the project, but it does not run in a task. What feature applies?
   A. Toggle Boolean
   B. Show Operation Log
   C. Compile Worksheet
   D. Compile Unused POUs
   E. Insert code worksheet
   F. Create globals from externals
   G. Update externals from globals
   H. Initialize Multi-element Variables

Programming Tips – Hardware Config (*eLM.MotionWorksIEC.35.MWIEC3_PThc)*

109. The programmer would like to determine what changes have been made to the offline configuration. What feature is appropriate?
   A. Show Differences in Configuration Comparison
   B. Web UI in Hardware Configuration
   C. Cascaded Master/Slave Depth
   D. Switch Hardware Mode
   E. Set Parameters on Multiple Axes
   F. Copy Parameters / Paste Parameters
   G. Logical Axis Number

110. The programmer would like to use an axis parameter configuration from another project. What feature is appropriate?
   A. Show Differences in Configuration Comparison
   B. Web UI in Hardware Configuration
   C. Cascaded Master/Slave Depth
   D. Switch Hardware Mode
   E. Set Parameters on Multiple Axes
   F. Copy Parameters / Paste Parameters
   G. Logical Axis Number

111. The application requires that axes be used in a complex electronic camming relationship. What feature might be useful?
   A. Show Differences in Configuration Comparison
   B. Web UI in Hardware Configuration
   C. Cascaded Master/Slave Depth
   D. Switch Hardware Mode
   E. Set Parameters on Multiple Axes
   F. Copy Parameters / Paste Parameters
   G. Logical Axis Number

112. An OEM wants to standardize the hardware configuration for different versions of the machines with different axes. What feature might be useful?
   A. Show Differences in Configuration Comparison
   B. Web UI in Hardware Configuration
   C. Cascaded Master/Slave Depth
   D. Switch Hardware Mode
   E. Set Parameters on Multiple Axes
   F. Copy Parameters / Paste Parameters
   G. Logical Axis Number

113. The programmer wants to test code changes on the controller and run the servos virtually. What feature may be appropriate?
   A. Show Differences in Configuration Comparison
   B. Web UI in Hardware Configuration
   C. Cascaded Master/Slave Depth
   D. Switch Hardware Mode
   E. Set Parameters on Multiple Axes
   F. Copy Parameters / Paste Parameters
   G. Logical Axis Number

CONGRATULATIONS! YOU COMPLETED THE LONGEST TEST IN THE HISTORY OF YASKAWA AMERICA INC.