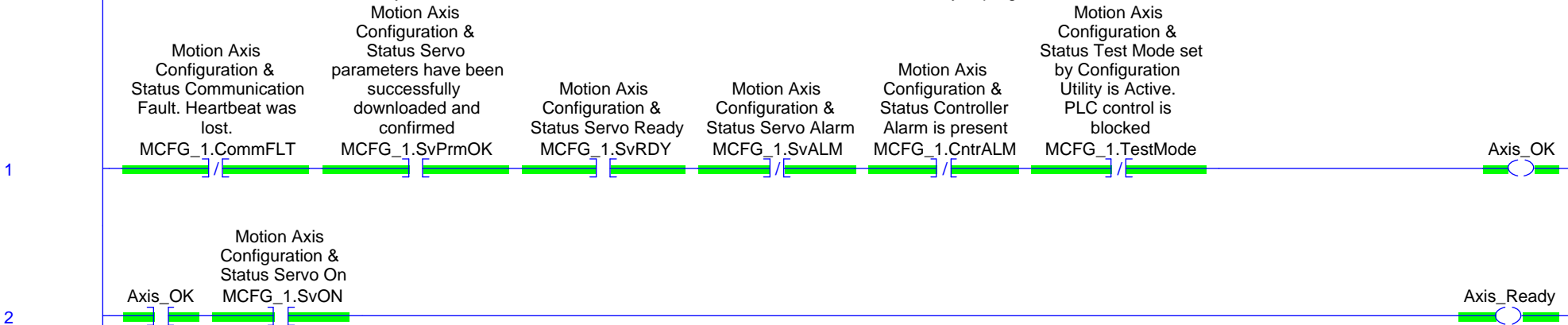

 MCFG Block Required to Configure Axis Structure for Use in AOIs; Also provides diagnostics useful for interlocking logic properly

IO Functions for this demo program:
 CN 1 SI 3 - Home Flag (selected for use in MAH)
 CN 1 SI 4 - Registration Input (If registration is used in MAM or MAJ)
 CN 1 SI 5 - Trigger High Speed Index Move when MHSI is enabled

Motion Axis Configuration & Status

MCFG_Yaskawa		
Motion Axis Configuration & Status	MCFG_1	(EN)
Axis_IN	SigmaLogic_Axis1:I	(DN)
Axis_OUT	SigmaLogic_Axis1:O	(ER)
Axis	Axis	(HB)
ParameterResolution	3	(CommFLT)
FeedRateOverride	100	(SvPrmOK)
PositionFB	2.0	(SvRDY)
SpeedFB	0.0	(SvON)
TorqueFB	0.0	(SvSTL)
ServoAlarmCode	16#0000	(SvWRN)
ServoWarningCode	16#0000	(SvABT)
ControllerAlarmCode	0	(CntrALM)
ApplicationErrorCode	0	(AppER)
SigmaLogicSoftware	10200006	(AOI_Active)
SigmaLogicFirmware	30000173	(TestMode)
		(SftwreMismatch)

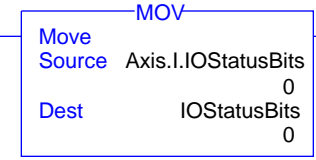
 Sample Interlocking Logic checking for valid Ethernet Connection, Alarms, Servo Ready Status, Servo Enable Status
 Also checks to see if an AOI is already in use as several motion blocks will not execute if another AOI is already in progress



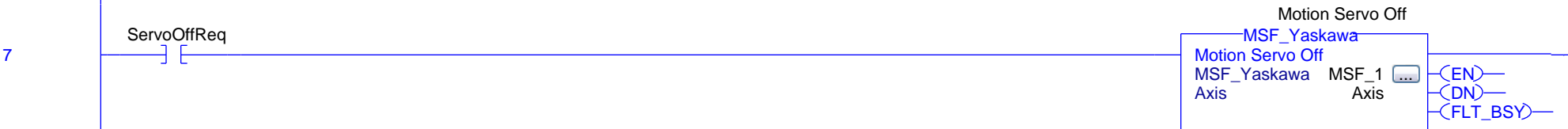
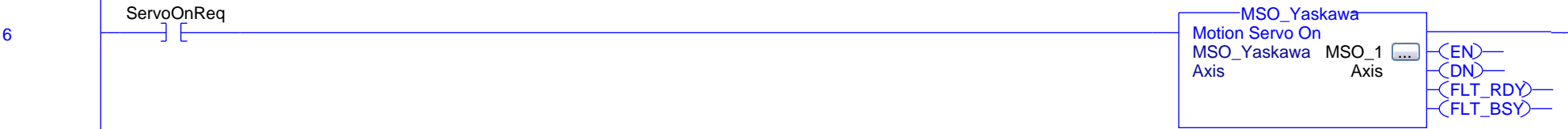
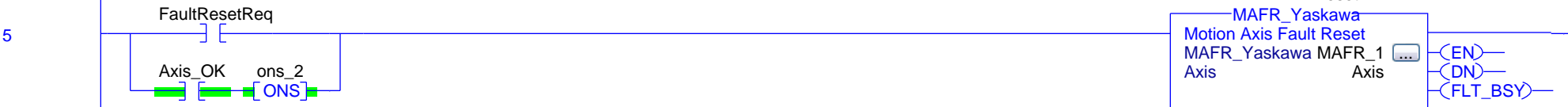
Motion Axis Configuration & Status An Axis AOI is Active

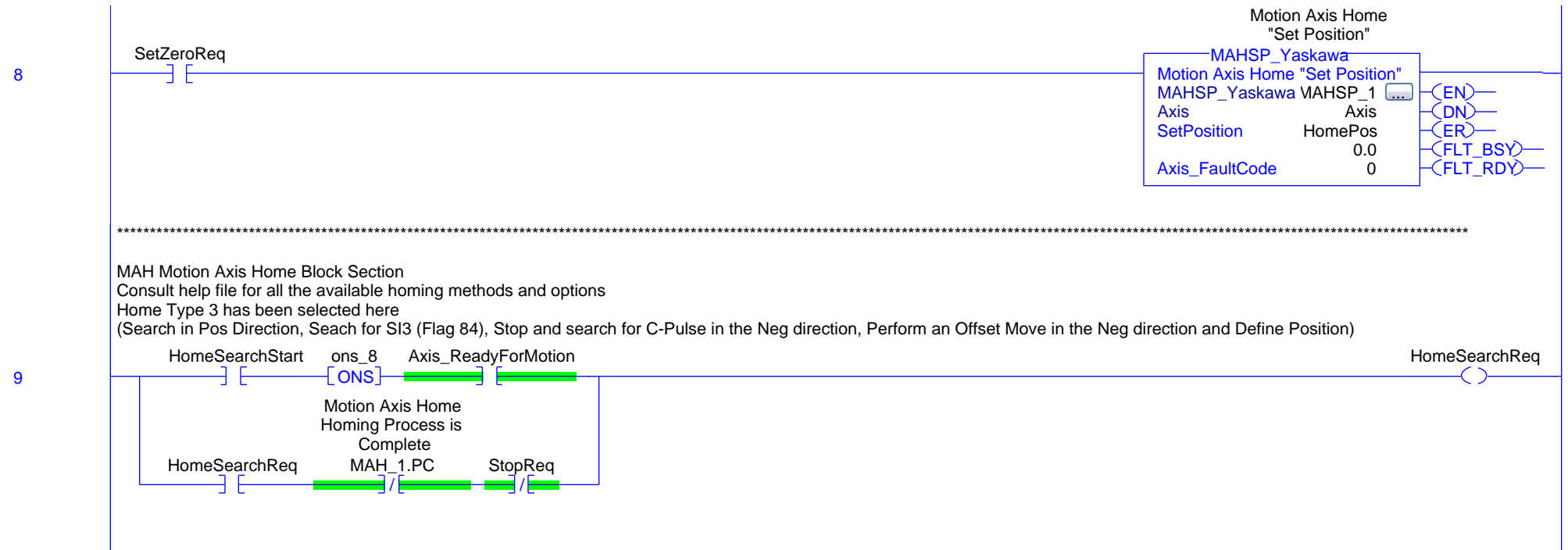


Yaskawa SigmaLogic Axis Structure Digital IO Status.
 Bits 0-7, CN13 Inputs 0-7, Used as Flag 65-72.
 Bits 8-15, CN13 Outputs 0-7, Used as Flag 73-80.
 Bits 16-22, CN1 Inputs 0-6, Used as Flag 81-87.
 Bits 23-25, CN1 Outputs 0-2, Used as Flag 88-90.
 The only reason for using the IOStatusBits variable instead of the Axis.IIOStatusBits location was to be able to customize the labels/descriptions.

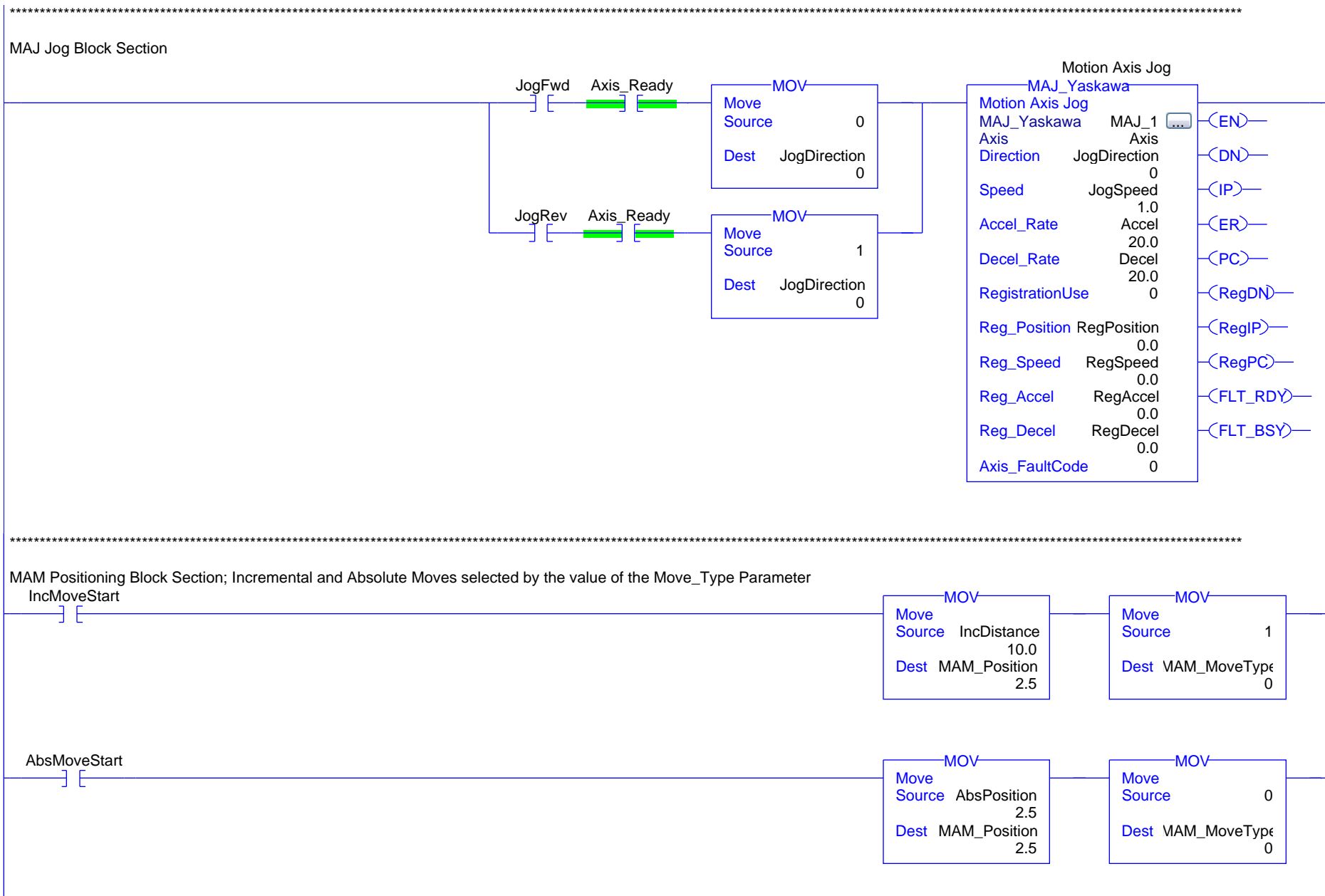


Section to Reset Faults, Enable/Disable Servo





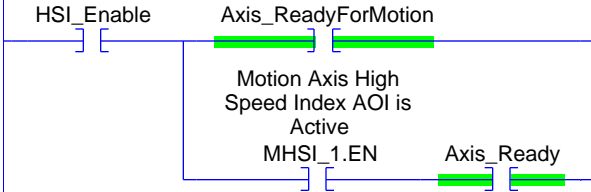






MHSI Motion High Speed Index Block Section
 Move Mode = 0 (Relative Move based on Distance input)
 Move Type = 0 (Single Move instead of repeating moves)
 CalcMethod = 0 (Use Accel/Decel)
 Trigger Flag = Flag 86 (CN 1 SI 5)
 Axis.I.HSI_Moving and Axis.I.HSI_Done bits are linked to CN 13 DO 6 and DO 7 just to show how the moving and done status can be accessed and used.
 The advantage to this type of move over the traditional MAM block is response time.

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Motion Axis High Speed Index

MHSI_Yaskawa

Motion Axis High Speed Index	MHSI_1	(EN)
Axis	Axis	(DN)
MoveMode	0	(IP)
MoveType	HSI_MoveType	(ER)
RepeatNumber	NumRepeats	(MV)
	2	(DW)
CalcMethod	0	(FLT_RDY)
Distance	IncDistance	(FLT_BSY)
	10.0	
Speed	Speed	
	5.0	
Accel	Accel	
	20.0	
MoveTime	0	
DwellTime	HSI_DwellTime	
	500	
Direction	0	
TriggerFlagAssign	86	
MovingFlagAssign	58	
DwellingFlagAssign	59	
DoneFlagAssign	60	
Axis_FaultCode	0	

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Yaskawa SigmaLogic
 Axis Structure
 Structure of data
 coming from the
 Yaskawa SigmaLogic
 controller.
 Axis.I.HSI_Moving

CN13 Output 6 (DO6)
 OutputCommandBits.6

Yaskawa SigmaLogic
 Axis Structure
 Structure of data
 coming from the
 Yaskawa SigmaLogic
 controller.
 Axis.I.HSI_Done

CN13 Output 7 (DO7)
 OutputCommandBits.7

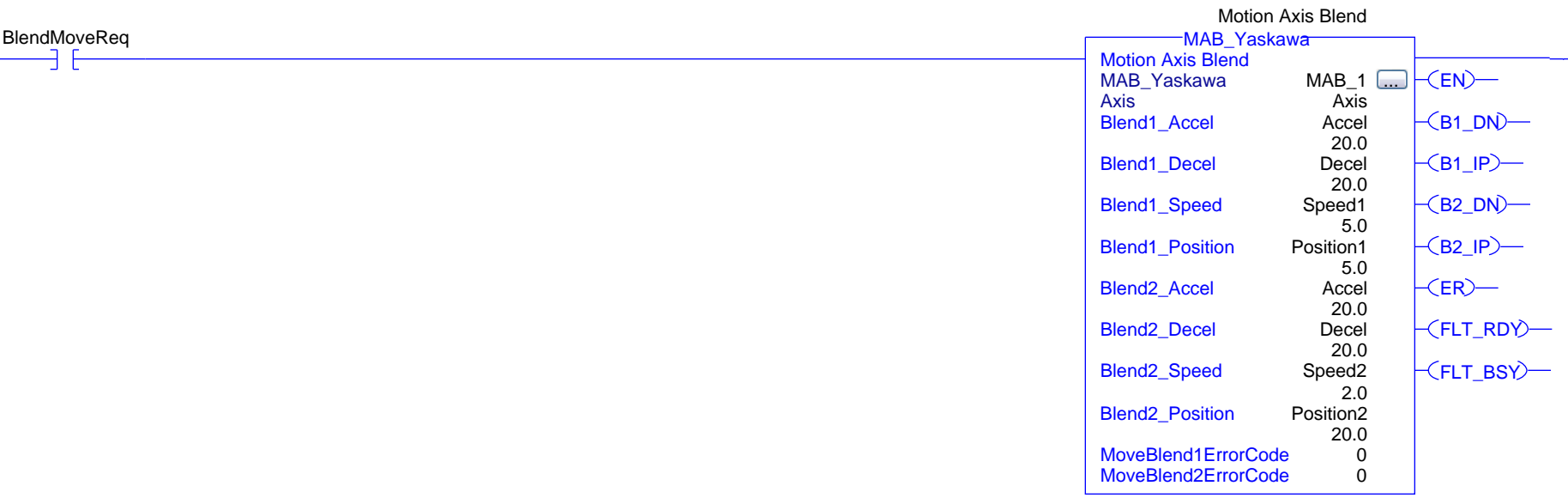
18

MAB Blended Move Block Section
 Note: All positions are absolute
 After execution is started, the move is commanded to Blend1_Position using the Blend1 Accel, Decel and Speed
 After reaching Blend1_Position, the axis will continue on to Blend2_Position at the Blend2 Accel, Decel and Speed without stopping

19



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MAG Electronic Gearing Section

When enabled, the motor follows the external encoder input at a ratio of Slave_Counts/Master_Counts
 Superimposed Move allows the user to add a move on top of the gearing operation; This is enabled whenever SuperUse is set to 1.
 Superimposed Move parameters can be updated even when gearing is enabled. The AOI looks at these parameters on the rising edge of SuperStart

Motion Axis Gear

MAG_Yaskawa		
Motion Axis Gear	MAG_Yaskawa	MAG_1
Axis	Axis	Axis
Direction	GearDirection	0
Slave_Counts	Numerator	1
Master_Counts	Denominator	1
Accel_Rate	Accel	20.0
Decel_Rate	Decel	20.0
SuperUse	SuperUse	1
SuperStart	SuperStart	0
SuperSpeed	SuperSpeed	5.0
SuperAccel	Accel	20.0
SuperDecel	Decel	20.0
SuperDistance	Offset	2.0

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Sequence Table Section; This executes a pre-programmed Sequence Table in SigmaLogic

Note: No Sequence Complete Bit exists so the Sequence Table in SigmaLogic has been programmed to turn on General Flag 64 (Axis.I.FlagStatusBit2.31) after the last step is finished. This provides feedback that the sequence is complete. Flag 64 is reset (turned OFF) when the enable to the MSQR block is removed.

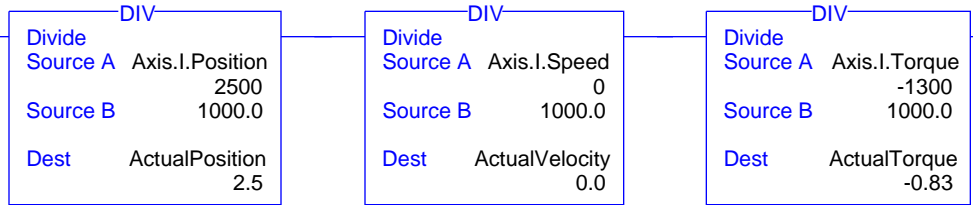
22





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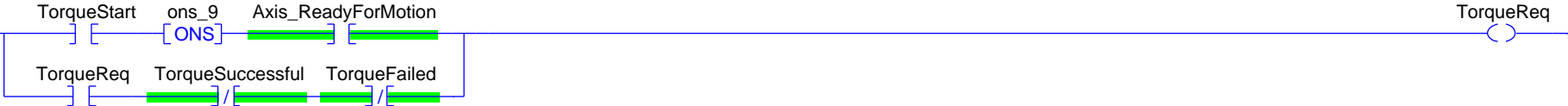
Section to Scale Feedback parameters from SigmaLogic into REAL for display purposes and easy use in comparison functions



MTRQ Motion Axis Torque Block

TorqueStart will start the motor spinning in torque mode. The torque will be clamped at the Torque setpoint (SP).
 If the torque has been achieved for at least 500ms, then it is considered successful.
 If the torque has not been achieved for 5 seconds, it is assumed that the torque operation has failed.

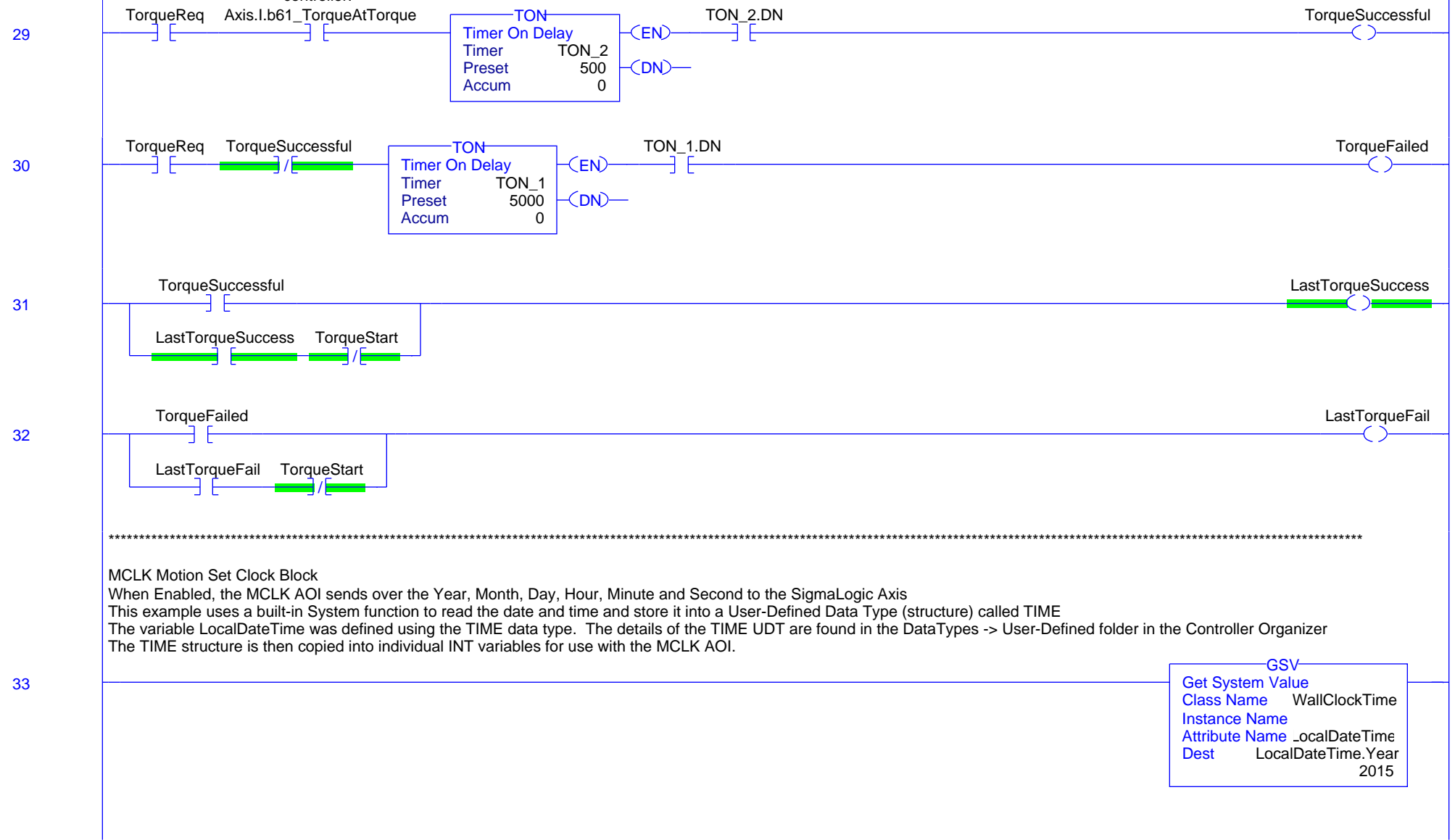
27

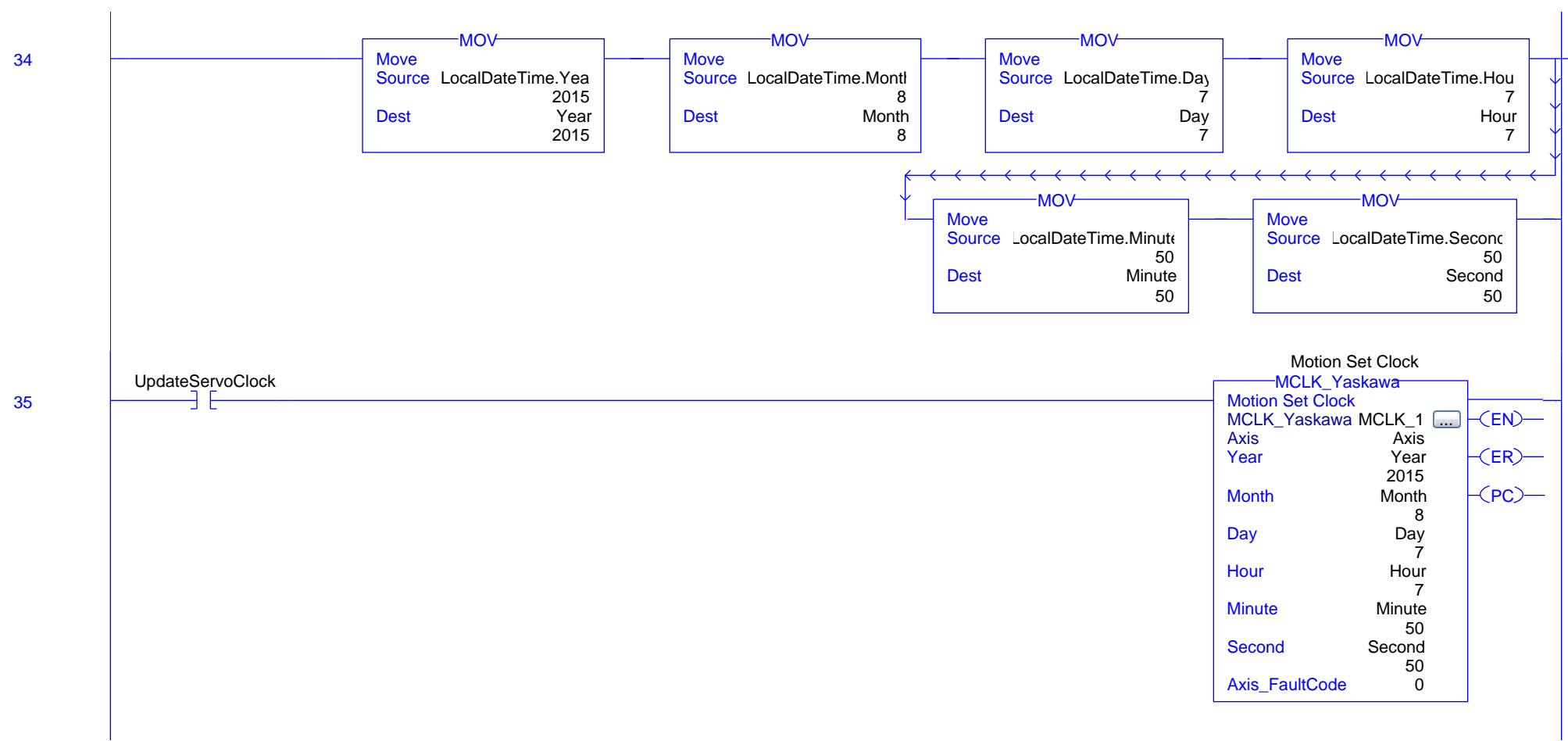


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Yaskawa SigmaLogic
 Axis Structure
 Structure of data
 coming from the
 Yaskawa SigmaLogic
 controller.





MPLS Motion Programmable Limit Switch Block Section
 Switch 1 defined as: (Flag 73) CN 13 DO 00 is ON when $0 \leq \text{ActualPosition} \leq 2$
 Switch 2 defined as: (Flag 74) CN 13 DO 01 is ON when $1.5 \leq \text{ActualPosition} \leq 4$
 Switches 3 & 4 not configured

Structure of parameters needed for PLS switch operation using MPLS_Yaskawa If OnPosition < OffPosition output is ON between them. If OnPosition > OffPosition output is OFF between them and ON everywhere else.

Structure of parameters needed for PLS switch operation using MPLS_Yaskawa

Structure of parameters needed for PLS switch operation using MPLS_Yaskawa Assigns a Flag number to the PLS output channel. Must be a physical output Flag 73-80, 88-90.

MOV

MOV

MOV

Move
 Source Switch1OnPosition 0.5
 Dest Switch1Data.OnPositior 0.5

Move
 Source Switch1OffPosition 2.0
 Dest Switch1Data.OffPositior 2.0

Move
 Source 73
 Dest Switch1Data.FlagNumbe 73

Structure of parameters needed for PLS switch operation using MPLS_Yaskawa If OnPosition < OffPosition output is ON between them. If OnPosition > OffPosition output is OFF between them and ON everywhere else.

Structure of parameters needed for PLS switch operation using MPLS_Yaskawa

Structure of parameters needed for PLS switch operation using MPLS_Yaskawa Assigns a Flag number to the PLS output channel. Must be a physical output Flag 73-80, 88-90.

MOV

MOV

MOV

Move
 Source Switch2OnPosition 1.5
 Dest Switch2Data.OnPositior 1.5

Move
 Source Switch2OffPosition 4.0
 Dest Switch2Data.OffPositior 4.0

Move
 Source 74
 Dest Switch2Data.FlagNumbe 74

36

37

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PLS_Used

Motion Programmable
 Limit Switch

MPLS_Yaskawa

Motion Programmable Limit Switch	MPLS_1	(EN)
MPLS_Yaskawa	Axis	(DN)
Axis	Axis	(IP)
Switch1Data	Switch1Data	(ER)
Switch2Data	Switch2Data	(S1)
Switch3Data	Switch3Data	(S2)
Switch4Data	Switch4Data	(S3)
ActivateSwitch1	Switch1Usec	(S4)
	1	(FLT_RDY)
ActivateSwitch2	Switch2Usec	
	1	
ActivateSwitch3	Switch3Usec	
	0	
ActivateSwitch4	Switch4Usec	
	0	
Axis_FaultCode	0	

Write Digital Outputs to SigmaLogic (CN13 DO 0-7 and CN1 SO 1-3)
 Code above writes to the OutputCommandBits variable and this MOV instruction sends the command to SigmaLogic

Yaskawa SigmaLogic
 Axis Structure
 Digital Output
 commands.
 Bits 0-7 correspond
 to CN13 Digital
 Outputs 0-7, used as
 Flag 73-80.
 Bits 8-10 correspond
 to CN1 Digital
 Outputs 0-2 used as
 Flag 88-90"

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MOV

Move	OutputCommandBits	0
Source		0
Dest	\axis.O.DigitalOutCommandBit:	0

(End)