

- Controller GantryX1X2
  - Chapter 9 Virtual axis example
- Controller Fault Handler
- Power-Up Handler

## Tasks

- MainTask
  - UN01\_ExampleMachine
    - MainRoutine
    - CM01\_OperationLocal
      - Control Module: OperationLocal This routine monitors Unit level inputs to generate command triggers to initiate state transition commands used by the current active mode Operation
    - CM03\_FaultHandler
      - Fault Handler This routine monitors unit level events, and it merges all reported events (Unit and EMs) into an active and historical queue.
    - CM04\_SafetyRelay
    - SR20\_Initialize
      - Initialize Data Performs initialization of any local parameters of this Equipment Module and contained Control Modules that require it
    - UP00\_Procedure
    - UP01\_PackML
    - UP02\_StateComplete
  - EM01\_Axis\_X
    - MainRoutine
    - CM00\_Procedure
    - CM01\_EMConditions
    - CM02\_01\_ServoAxisObject\_X1
      - This Control Module performs the state control for the slave axis; including Enable, Disable, Reset, Absolute Home, Stop, and Abort
    - CM02\_02\_ServoAxisObject\_X2
      - This Control Module performs the state control for the slave axis; including Enable, Disable, Reset, Absolute Home, Stop, and Abort
    - CM02\_03\_MastVirtAxisObject\_X
      - This Control Module performs the state control for the slave axis; including Enable, Disable, Reset, Absolute Home, Stop, and Abort
    - CM03\_01\_ServoAxisJog\_X1
      - Control Module Manual Jog Control This Control Module jogs the servo axis when the Unit is in Manual mode. This provides independent control of the servo axis.
    - CM03\_02\_ServoAxisJog\_X2
      - Control Module Manual Jog Control This Control Module jogs the servo axis when the Unit is in Manual mode. This provides independent control of the servo axis.
    - CM03\_03\_VirtualAxisJog\_X
      - Control Module Manual Jog Control This Control Module jogs the servo axis when the Unit is in Manual mode. This provides independent control of the servo axis.
    - CM04\_01\_ServoAxisGear\_X1
      - This Control Module defines the Gear follower profile, and initiates the synchronization of this slave to the master
    - CM04\_02\_ServoAxisGear\_X2
      - This Control Module defines the Gear follower profile, and initiates the synchronization of this slave to the master
    - SR03\_FaultHandler
    - SR20\_Initialize
      - Initialize Data Performs initialization of any local parameters of this Equipment Module and contained Control Modules that require it
    - SR30\_Simulate

## Unscheduled

## Motion Groups

- Motion\_Group
  - Axis\_1\_X1
  - Axis\_2\_X2
  - Axis\_3\_X

## Ungrouped Axes

## Add-On Instructions

- Axis\_ObjectAV
  - Logic
  - Prescan
- Axis\_ObjectCD
  - Axis CIP Drive Object



Logic



Prescan

PackMLv3\_StateModel



Logic



Prescan

**Data Types**

User-Defined

EM\_Faults

All the Fault bits related an Equipment

Strings

String\_Short

Add-On-Defined

Axis\_ObjectAV

Axis\_ObjectCD

Axis CIP Drive Object

PackMLv3\_StateModel

Module-Defined

AB:1734\_15SLOT:I:0

AB:1734\_15SLOT:O:0

AB:1734\_1SLOT:I:0

AB:1734\_1SLOT:O:0

AB:1734\_2SLOT:I:0

AB:1734\_2SLOT:O:0

AB:1734\_8CFG:C:0

AB:1734\_DI8:C:0

AB:1734\_DOB8:C:0

AB:1734\_IE8:C:0

AB:1734\_IE8:I:0

AB:1734\_OE4:C:0

AB:1734\_OE4:I:0

AB:1734\_OE4:O:0

AB:1756\_DI:C:0

AB:1756\_DI:I:0

AB:1769\_HSC1\_Range:C:0

AB:1794\_AEN\_2SLOT:I:0

AB:1794\_AEN\_2SLOT:O:0

AB:1794\_DO16:C:0

AB:1794\_IB16:C:0

AB:440R\_ENETR\_42:I:0

AB:Embedded\_AnalogIO1:C:0

AB:Embedded\_AnalogIO1:I:0

AB:Embedded\_AnalogIO1:O:0

AB:Embedded\_DiscreteIO1:C:0

AB:Embedded\_DiscreteIO1:I:0

AB:Embedded\_DiscreteIO1:O:0

AB:Embedded\_HSC1:C:0

AB:Embedded\_HSC1:I:0

AB:Embedded\_HSC1:O:0

AB:Embedded\_HSC1\_STRUCT\_OUT1:O:0

AB:Motion\_Diagnostics:S:1

**Trends** Y\_Axis**I/O Configuration**

1756 Backplane, 1756-A10

[0] 1756-L71 GantryX1X2

[1] 1756-EN2TR en2tr

Ethernet

440R-ENETR/A a440\_enetr

1756-EN2TR en2tr

2097-V31PR0-LM Axis\_X1\_Servo

 2097-V31PR0-LM Axis\_X2\_Servo

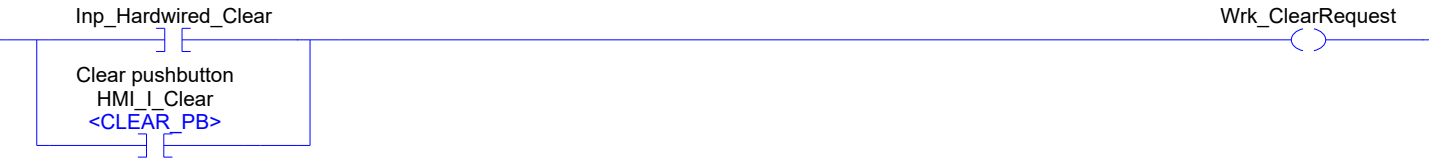
COMPANY: Rockwell Automation  
FUNCTION: Local Input Summary  
AUTHOR: Rockwell Automation  
DATE CREATED: March 2011

Version Comments:

[NOP]

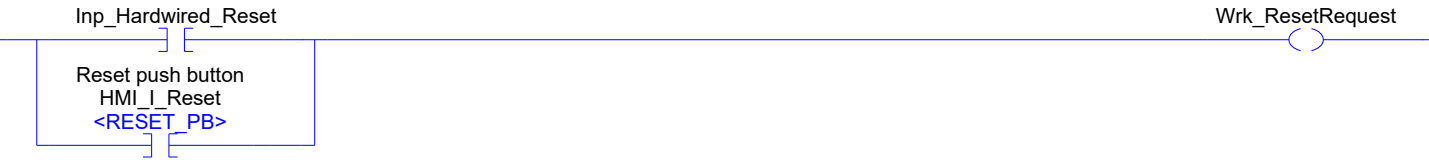
**CLEAR FAULTS CONDITIONS**

The Unit Conditions Set Here Are Used to Clear Faults and Initiate a State Transition of the Current Mode Operation Procedure from the Aborted State:  
1) To the Clearing State, If the Clearing State is Enabled  
2) To the Stopped State, If the Clearing State is Disabled



**RESET CONDITIONS**

The Unit Condition Set Here Is Used to Initiate the Start Warning Cycle That Results in a State Transition of the Current Mode Operation Procedure from the Stopped State:  
1) To the Resetting State, If the Resetting State is Enabled  
2) To the Idle State, If the Resetting State is Disabled



**START CONDITIONS**

The Unit Condition Set Here is Used to  
1) If the Idle State is Enabled, Initiate a State Transition of the Current Mode Operation Procedure:  
a) From the Idle State to the Starting State, If the Starting State Is Enabled  
b) From the Idle State to the Execute State, If the Starting State Is Disabled  
2) If the Idle State is Disabled, Initiate the Start Warning Cycle That Results in a State Transition of the Current Mode Operation Procedure from the Stopped State:  
a) To the Resetting State, If the Resetting State Is Enabled  
b) To the Starting State, If the Resetting State is Disabled and the Starting State Is Enabled  
c) To the Execute State, If Bothe the Resetting and Starting States Are Disabled



\*\*\*\*\* Changed polarity of Inp\_Hardwired\_Stop to match it being a N.C. contact

**STOP CONDITIONS**

The Unit Condition Set Here is Used to Initiate a State Transition of the Current Mode Operation Procedure to the:  
1) Stopping State, If the Stopping State Is Enabled  
2) Stopped State, If the Stopping State Is Disabled

From Any of the Following States:

Resetting, Idle, Starting, Execute, Holding, Held, UnHolding, Suspending, Suspended, UnSuspending, Completing

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Inp\_Hardwired\_Stop

Wrk\_StopRequest

Stop push button  
HMI\_I\_Stop  
<STOP\_PB>

Use of the Holding  
state for the  
current mode is  
enabled

UN01\_MachineStateModel.Sts\_HoldingEnabled UN01\_MachineFault\_Minor

**ABORT CONDITIONS**

The Unit Condition Set Here is Used to Initiate a State Transition of the Current Mode Operation Procedure to the:  
1) Aborting State, If the Aborting State Is Enabled  
2) Aborted State, If the Aborting State Is Disabled

From Any of the Following States:

Resetting, Idle, Starting, Execute, Holding, Held, UnHolding, Suspending, Suspended, UnSuspending, Completing, Stopped, Stopping, Clearing

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UN01\_MachineFaulted

Wrk\_AbortRequest

**HOLD CONDITIONS**

The Unit Condition Set Here is Used to Initiate a State Transition of the Current Mode Operation Procedure from the Execute State to the:  
1) Holding State, If the Holding State is Enabled  
2) Held State, If the Holding State is Disabled

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Inp\_Hardwired\_Hold

Wrk\_HoldRequest

HMI\_I\_Hold

UN01\_MachineFault\_Minor

**UN-HOLD CONDITIONS**

The Unit Condition Set Here is Used to Initiate a State Transition of the Current Mode Operation Procedure from the Held State to the:  
1) UnHolding State, If the UnHolding State is Enabled  
2) Execute State, If the UnHolding State is Disabled

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Inp\_Hardwired\_UnHold

Wrk\_UnHoldRequest

HMI\_I\_UnHold

**SUSPEND CONDITIONS**

If any upstream or downstream material interlocks are not satisfied a suspend request will be made.

If a suspend request is made while the Machine is in the Execute State, Then a State Transition Is Initiated From the Execute State to the:

- 1) Suspending State, If the Suspending State Is Enabled
- 2) Suspended State, If the Suspending State Is Disabled

When ALL interlock conditions Are Satisfied, Then a State Transition Is Initiated From the Suspended State to the:

- 1) UnSuspending State, If the UnSuspending State Is Enabled
- 2) Execute State, If the UnSuspending State Is Disabled

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Inp\_UpstreamMaterialInterlock

Wrk\_SuspendRequest

Inp\_DownstreamMaterialInterlock

**COMPLETE CONDITION**

The Unit Condition Set Here is Used to Indicate That the Unit Has Produced the Desired Quantity of Good Product. It is Used for Processes That Run Desired Batch or Job Quantities And Automatically Stop to Conserve Materials. Such Processes Take Advantage of the Completing And Complete States of the PackML Model.

This Unit Condition is Generated By Comparing the Quantity of Good Product Counted or Calculated By the Program (In this Example, the Information from the Performance Tracking AOI is Used to Calculate Good Product \* ), to the Batch Count Setpoint for the Current Recipe.

The Condition Initiates a State Complete Transition from the Execute State to the:

- 1) Completing State, If the Completing State Is Enabled
- 2) Complete State, If the Completing State Is Disabled

\* The Production Counting Data Used By the Performance Tracking AOI Must Be Generated By the Program and Input Into the AOI. It May Be Preferred to Use the Production Counting Data Directly for Setting this Condition.

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GE

Grtr Than or Eq (A>=B)

Source A      Sts\_GoodProducts

0

Source B    Inp\_BatchCountSetpoint

0

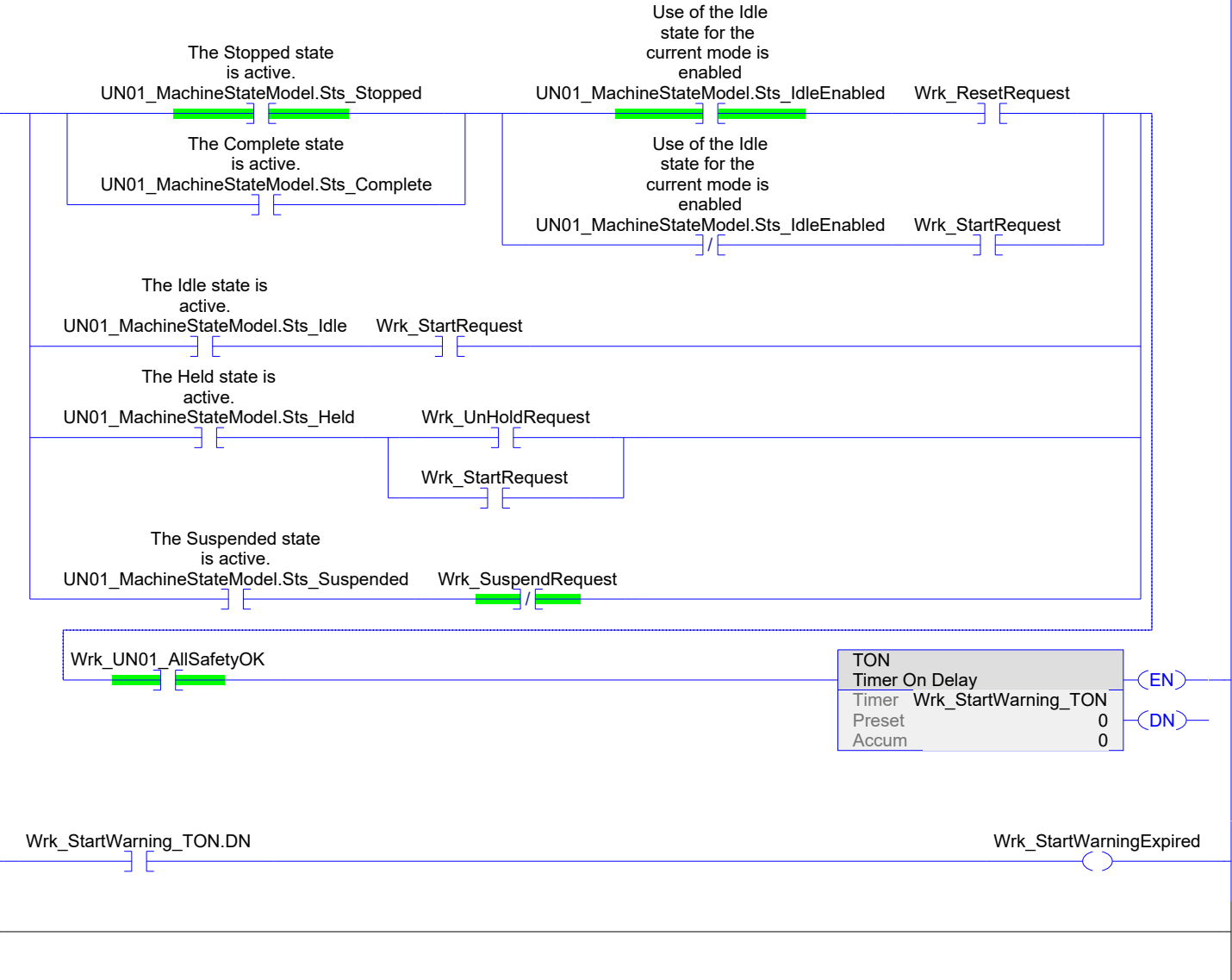
Wrk\_CompleteRequest

\*\*\*\*\* Wrk\_StartWarning\_TON preset changed to zero

UNIT START LOGIC

This Unit Start Logic is Used to Provide a Warning Cycle Time Before Motion Occurs on the Machine.  
 This Warning Cycle Should be Used Upon Initiating All State Transition Commands That Ultimately Result in Transition to the Execute State,  
 And May be Used to Provide Audible And/Or Visual Notification to the Operator That Motion Will Occur Upon Completion.

In case of Start warning buzzer included in the logic increase the timer preset to 1 or 2 sec



10

11

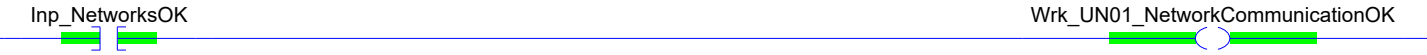
(End)

COMPANY: Rockwell Automation  
 FUNCTION: Fault Handler / Alarm Annunciation  
 AUTHOR: Rockwell Automation  
 DATE CREATED: March 2011

Version Comments:

[ NOP ]

**COMMUNICATION FAULTS**



**ESTOP COLLECTION**



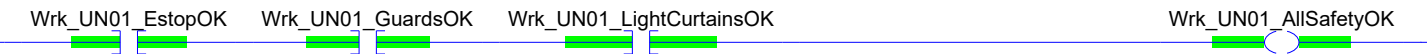
**GUARD DOOR COLLECTION**



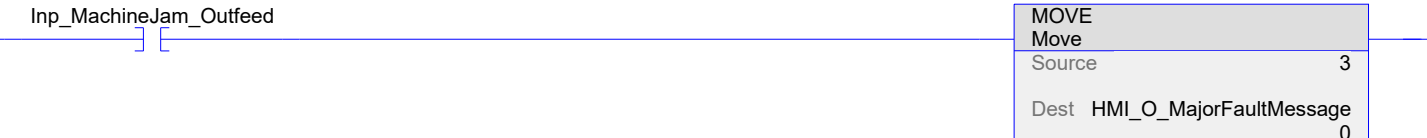
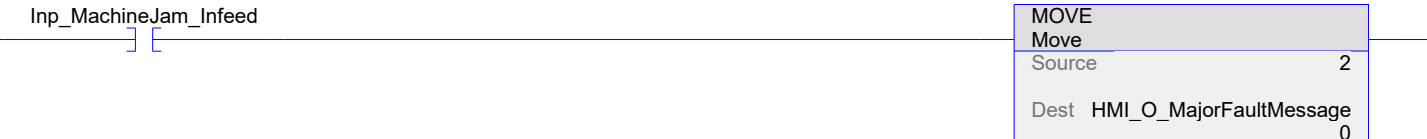
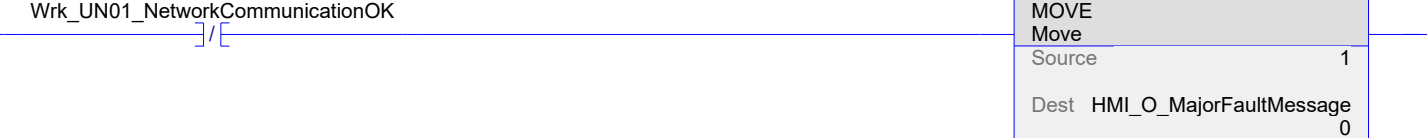
**LIGHT CURTAIN COLLECTION**

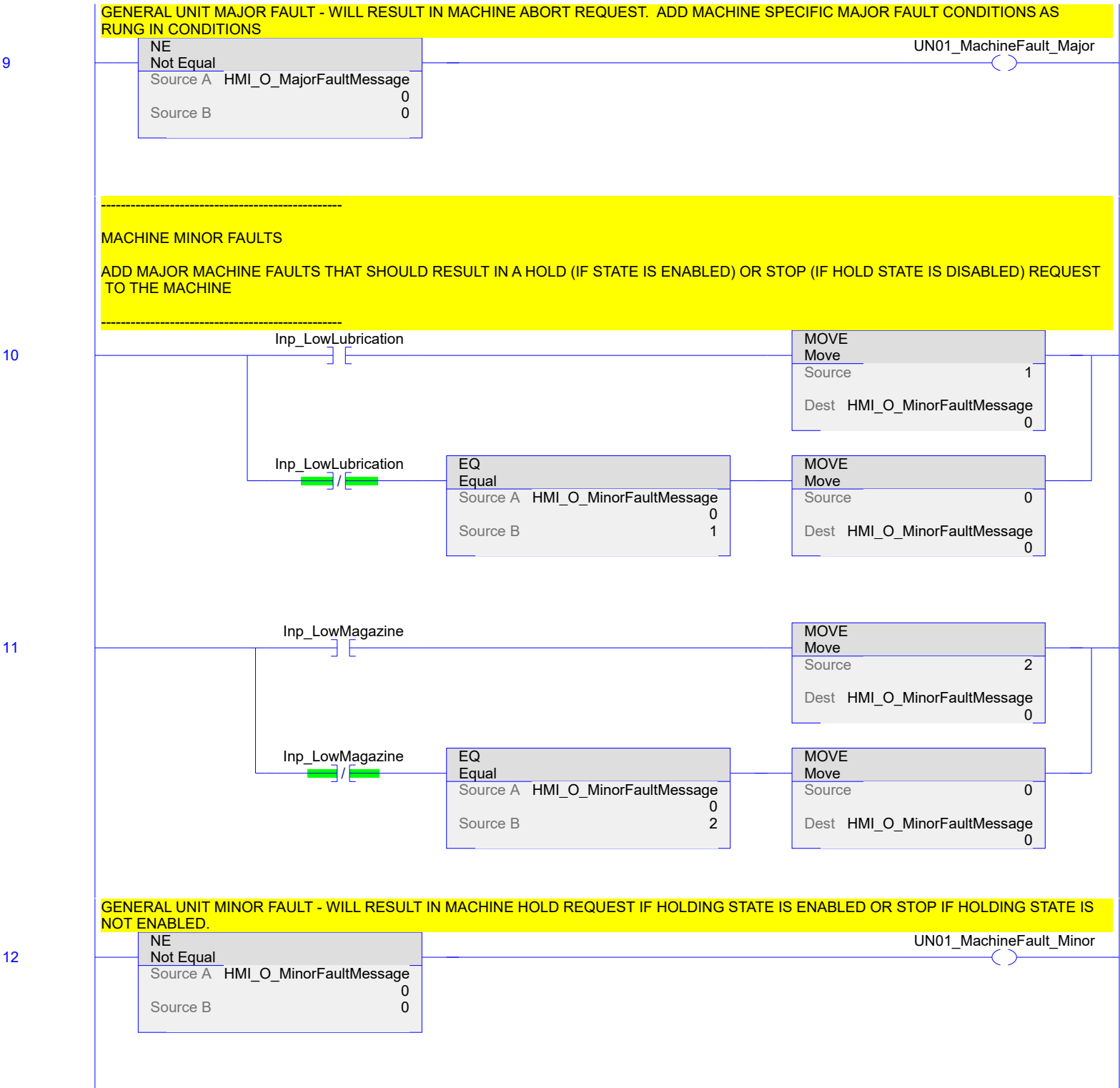


**ALL SAFETY INPUTS OK**



MACHINE MAJOR FAULTS  
 ADD MAJOR MACHINE FAULTS THAT SHOULD RESULT IN AN ABORT REQUEST TO THE MACHINE





-----  
CLEAR MACHINE FAULT INDICATORS  
  
MAJOR FAULTS RESULT IN THE MACHINE STATE GOING TO ABORTING. MAJOR MACHINE FAULTS SHOULD BE RESET IN THE CLEARING STATE  
  
MINOR FAULTS RESULT IN EITHER A HOLD CONDITION OR STOP CONDITION. ONCE CONDITIONS INITIATING MINOR FAULTS ARE SATISFIED THE FAULTS WILL CLEAR AUTOMATICALLY. MINOR FAULT INDICATORS WILL ALSO BE CLEARED IN THE CLEARING STATE.  
-----

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The Clearing state  
is active.  
UN01\_MachineStateModel.Sts\_Clearing

MOVE	
Move	
Source	0
Dest	HMI_O_MinorFaultMessage
	0

MOVE	
Move	
Source	0
Dest	HMI_O_MajorFaultMessage
	0

GENERAL UNIT FAULT SUMMARY

Wrk\_UN01\_AllSafetyOK

UN01\_MachineFaulted

UN01\_MachineFault\_Major

All the Fault bits related an Equipment Any EM major fault active EM_Fault[0].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.0
---	--

All the Fault bits related an Equipment Any EM major fault active EM_Fault[1].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.1
---	--

All the Fault bits related an Equipment Any EM major fault active EM_Fault[2].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.2
---	--

All the Fault bits related an Equipment Any EM major fault active EM_Fault[3].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.3
---	--

All the Fault bits related an Equipment Any EM major fault active EM_Fault[4].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.4
---	--

All the Fault bits related an Equipment Any EM major fault active EM_Fault[5].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.5
---	--

All the Fault bits related an Equipment Any EM major fault active EM_Fault[6].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.6
---	--

All the Fault bits related an Equipment Any EM major fault active EM_Fault[7].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.7
---	--

All the Fault bits related an Equipment Any EM major fault active EM_Fault[8].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.8
---	--

All the Fault bits related an Equipment Any EM major fault active EM_Fault[9].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.9
---	--

All the Fault bits related an Equipment Any EM major fault active EM_Fault[10].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.10
--	---

All the Fault bits related an Equipment Any EM major fault active	This Tag is used to enable states for each Equipment Module
---	---

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related an Equipment Any EM major fault active EM_Fault[24].EM_MajorFaultAct	enable states for each Equipment Module EM_Selected.24
All the Fault bits related an Equipment Any EM major fault active EM_Fault[25].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.25
All the Fault bits related an Equipment Any EM major fault active EM_Fault[26].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.26
All the Fault bits related an Equipment Any EM major fault active EM_Fault[27].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.27
All the Fault bits related an Equipment Any EM major fault active EM_Fault[28].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.28
All the Fault bits related an Equipment Any EM major fault active EM_Fault[29].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.29
All the Fault bits related an Equipment Any EM major fault active EM_Fault[30].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.30
All the Fault bits related an Equipment Any EM major fault active EM_Fault[31].EM_MajorFaultAct	This Tag is used to enable states for each Equipment Module EM_Selected.31

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Wrk\_UN01\_EstopOK  
 ]/] [

Inp\_ESTOPButton1 HMI\_O\_MachineSafetyFault.0  
 ]/] [

Inp\_ESTOPButton2 HMI\_O\_MachineSafetyFault.1  
 ]/] [

Inp\_ESTOPButton3 HMI\_O\_MachineSafetyFault.2  
 ]/] [

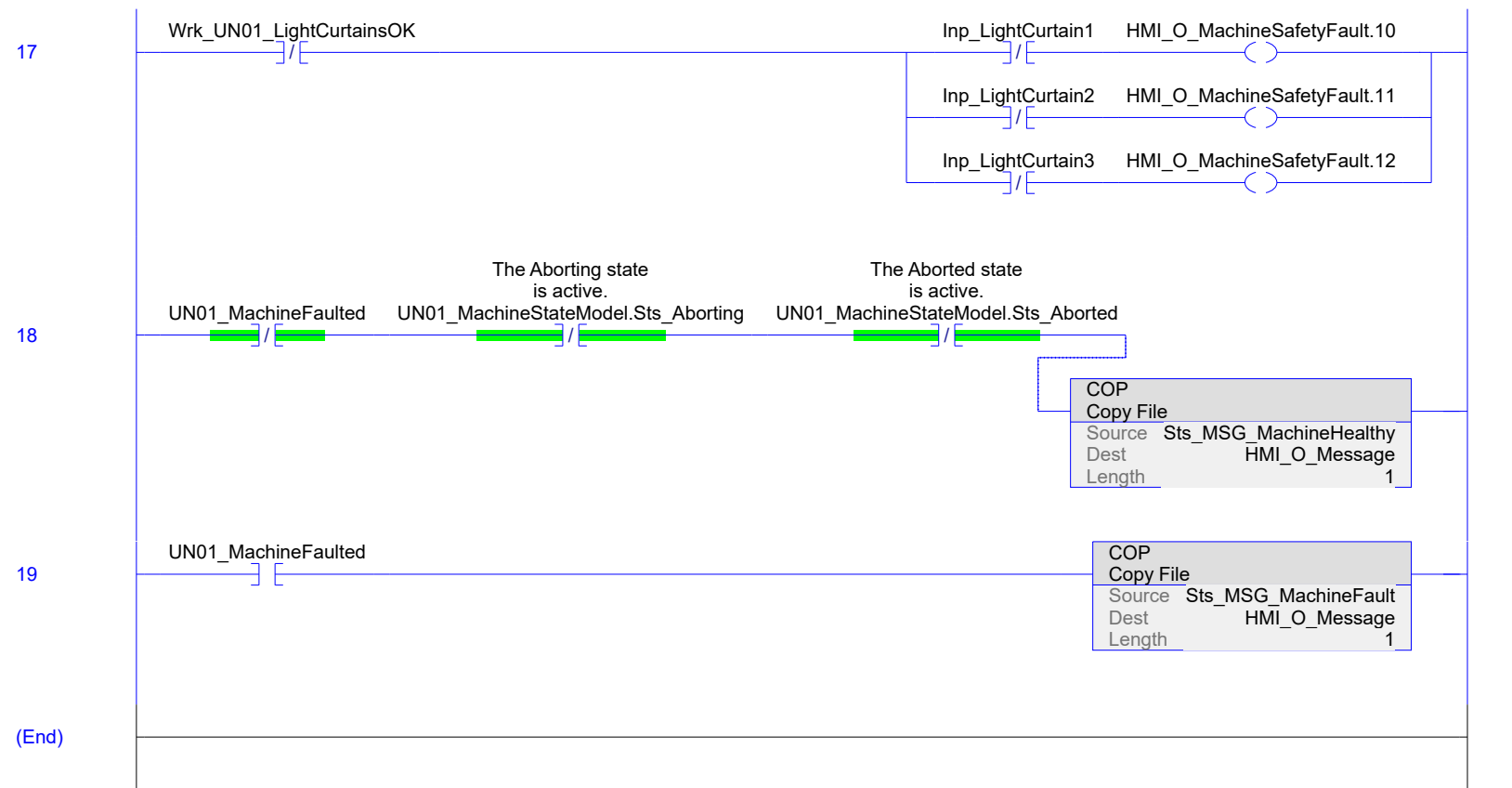
16

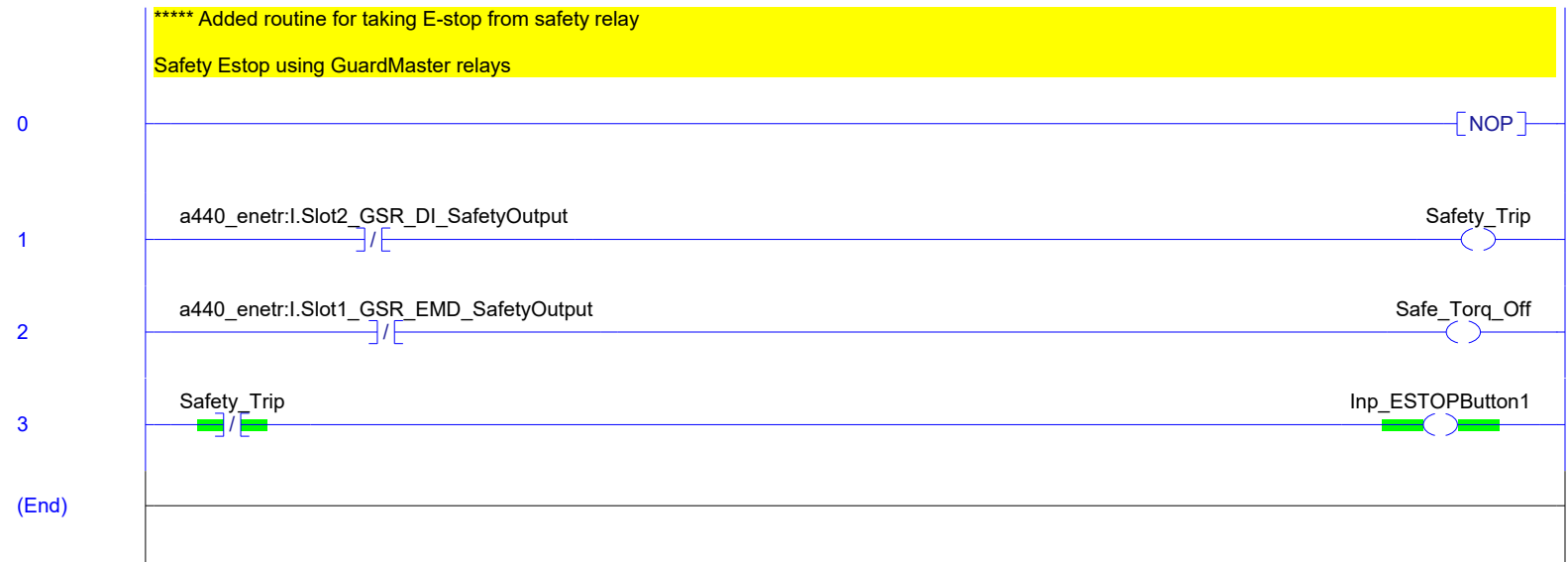
Wrk\_UN01\_GuardsOK  
 ]/] [

Inp\_GuardDoor1 HMI\_O\_MachineSafetyFault.5  
 ]/] [

Inp\_GuardDoor2 HMI\_O\_MachineSafetyFault.6  
 ]/] [

Inp\_GuardDoor3 HMI\_O\_MachineSafetyFault.7  
 ]/] [





PackML implementation for a 2-axis machine using the H-Bridge gantry.  
The bridge Y axis is here used as the X axis. Movement is Y and Z axes. Each axis is treated as a separate EM  
Started with the Rockwell Power Programming BasicV4\_2.acd sample project.

[NOP]

////////////////////////////////////  
COMPANY: Rockwell Automation  
FUNCTION: Main Routine  
AUTHOR: Rockwell Automation/Kelvin Erickson  
DATE CREATED: March 2011  
Version Comments:  
////////////////////////////////////

Initialize Data

Performs initialization of any local parameters of this Equipment Module and contained Control Modules that require it

S:FS  
] [

JSR  
Jump To Subroutine  
Routine Name SR20\_Initialize

Control Module:  
OperationLocal  
This routine monitors Unit level inputs to generate command triggers to initiate state transition commands used by the current active mode  
Operation

JSR  
Jump To Subroutine  
Routine Name CM01\_OperationLocal

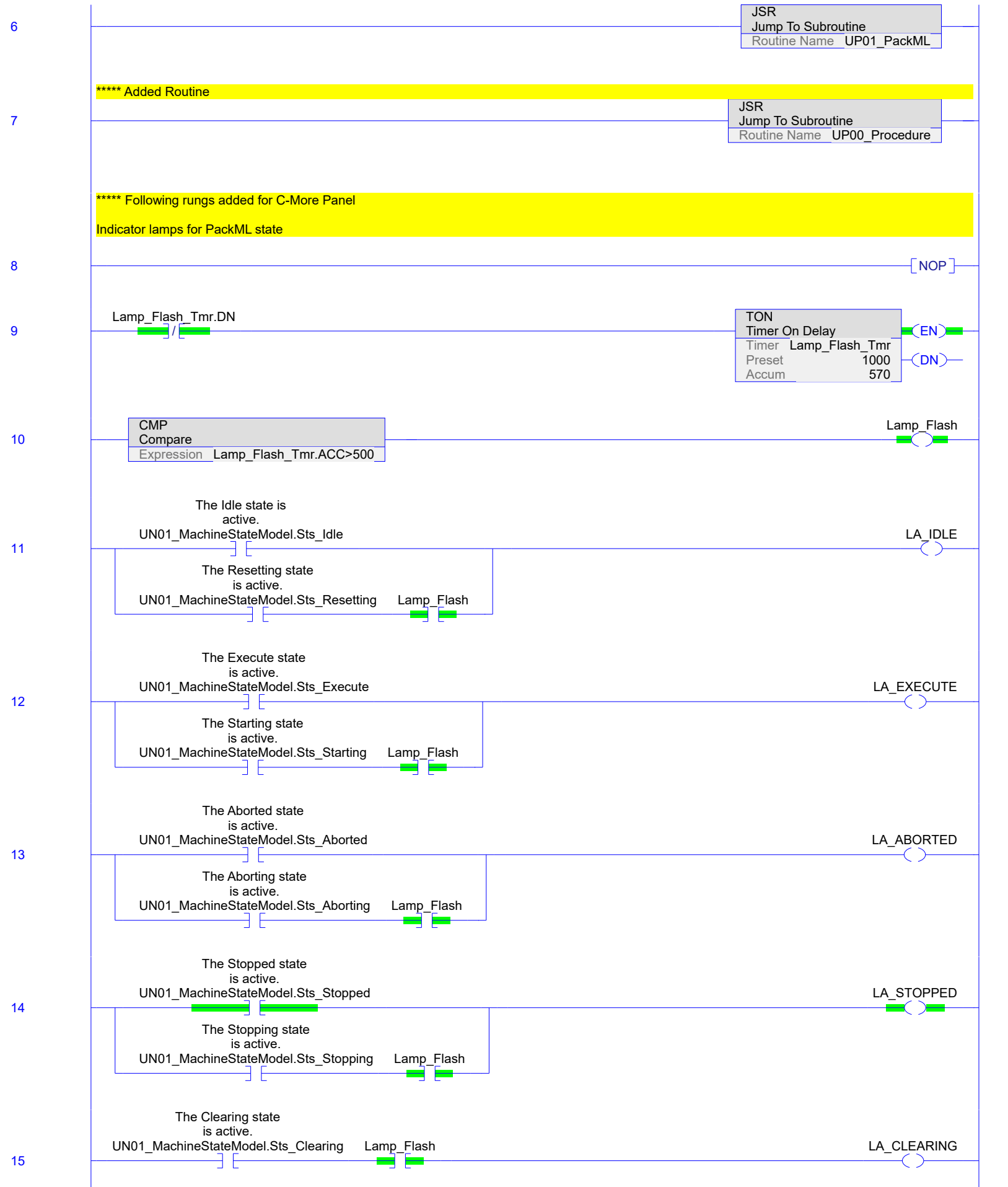
Fault Handler  
This routine monitors unit level events, and it merges all reported events (Unit and EMs) into an active and historical queue.

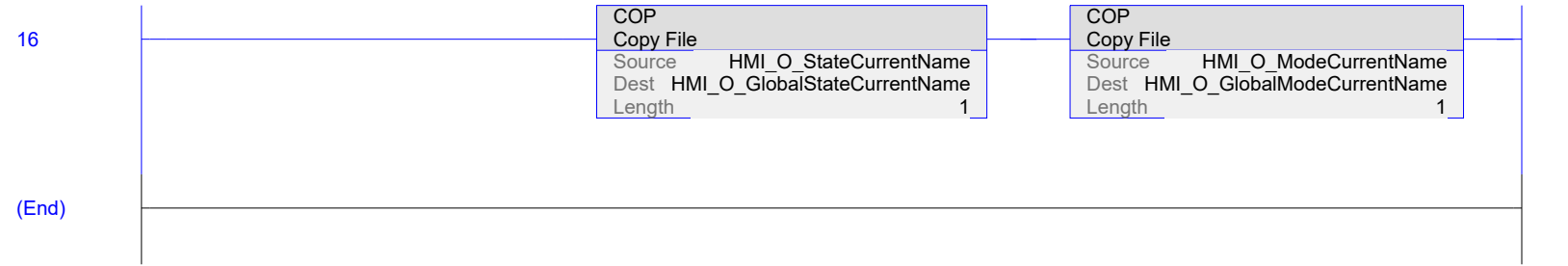
JSR  
Jump To Subroutine  
Routine Name CM03\_FaultHandler

\*\*\*\* Added routine

JSR  
Jump To Subroutine  
Routine Name CM04\_SafetyRelay

JSR  
Jump To Subroutine  
Routine Name UP02\_StateComplete





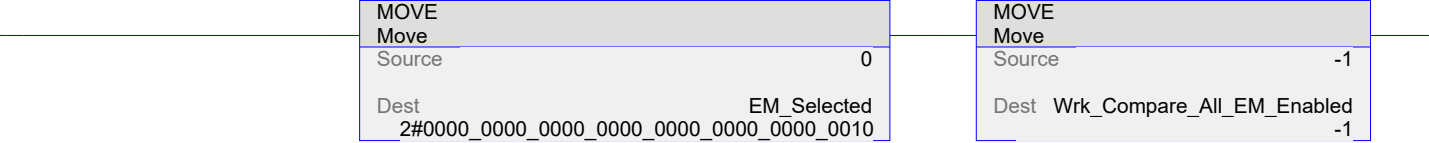
COMPANY: Rockwell Automation  
 FUNCTION: Machine Data Initialization  
 AUTHOR: Rockwell Automation  
 DATE CREATED: March 2011

Version Comments:

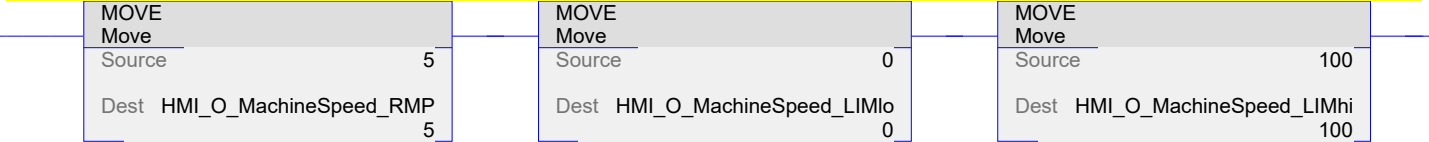
[NOP]

Clear EM selected bits. Each EM will set bit as it initializes. Initialize value used to check for EM state complete bits

This Tag is used to enable states for each Equipment Module



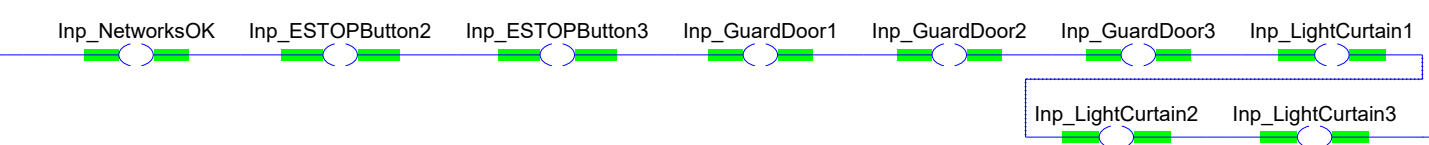
INITIALIZE HMI MACHINE SPEED LIMITS  
 -RAMP INCREMENT  
 -MACHINE SPEED MINIMUM  
 -MACHINE SPEED MAXIMUM



Clear unit procedure step



\*\*\*\* Make networks okay and all unused safetys enabled



\*\*\*\* Disable unused stop



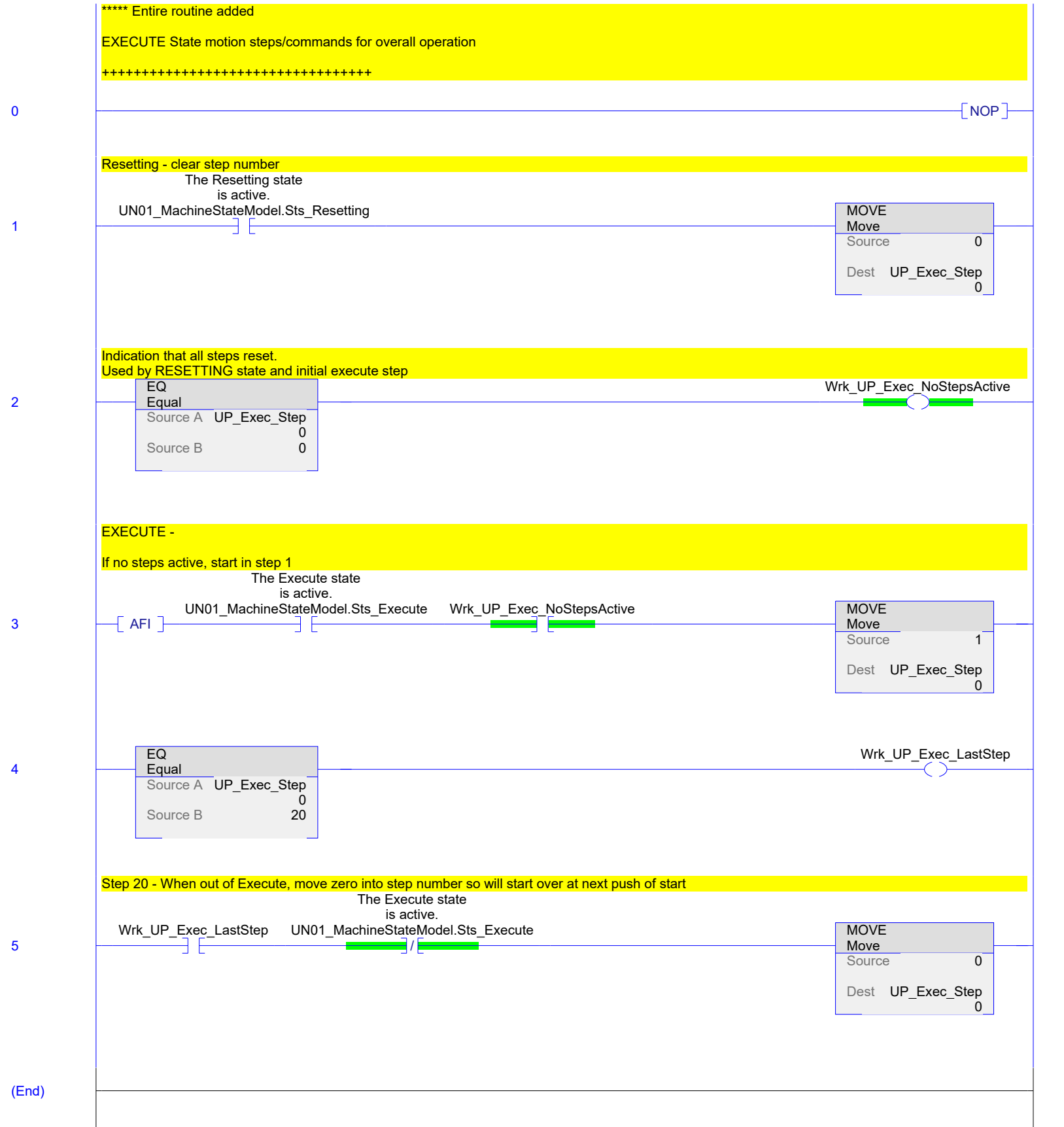
\*\*\*\* Disable interlocks



\*\*\*\* Enable remote commands







COMPANY: Rockwell Automation  
 FUNCTION: PACK ML State and Mode Management  
 AUTHOR: Rockwell Automation  
 DATE CREATED: March 2011

Version Comments:

[NOP]

**STATE COMMAND CLEAR**

This Command is Triggered by the Unit Condition Indicating a Clear Faults Request Has Been Received. The Command Initiates in the PackML AOI for the Current Mode Operation Procedure to Transition From the Aborted State to:

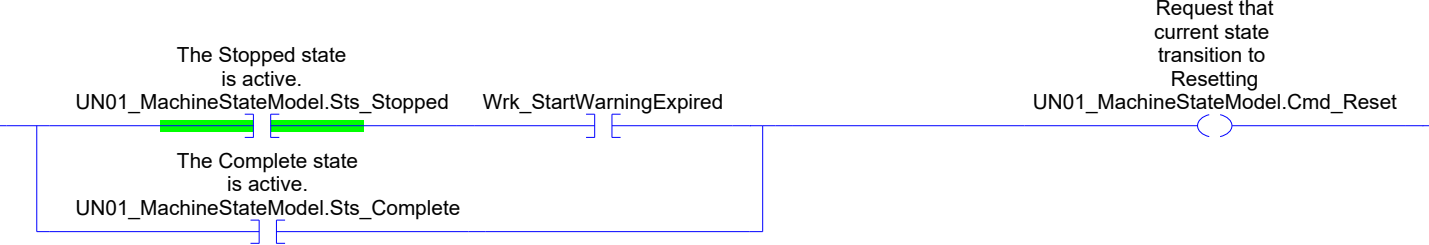
- 1) The Clearing State, If Clearing is Enabled
- 2) The Stopped State, If Clearing is Disabled



**STATE COMMAND RESET**

This Command is Triggered by the Unit Condition Indicating the Start Warning Cycle Has Completed. The Command Initiates in the PackML AOI for the Current Mode Operation Procedure to Transition From the Stopped or Complete State to:

- 1) The Resetting State, If Resetting Is Enabled
- 2) The Idle State, If Resetting is Disabled and Idle Is Enabled
- 3) The Starting State, If Resetting and Idle Are Disabled and Starting is Enabled
- 4) The Execute State, If Resetting, Idle, and Starting Are Disabled



**STATE COMMAND START**

This Command is Triggered by the Unit Condition Indicating the Start Warning Cycle Has Completed. The Command Initiates in the PackML AOI for the Current Mode Operation Procedure to Transition From the Idle State to:

- 1) The Starting State, If Starting is Enabled
- 2) The Execute State, If Starting is Disabled



**STATE COMMAND HOLD**

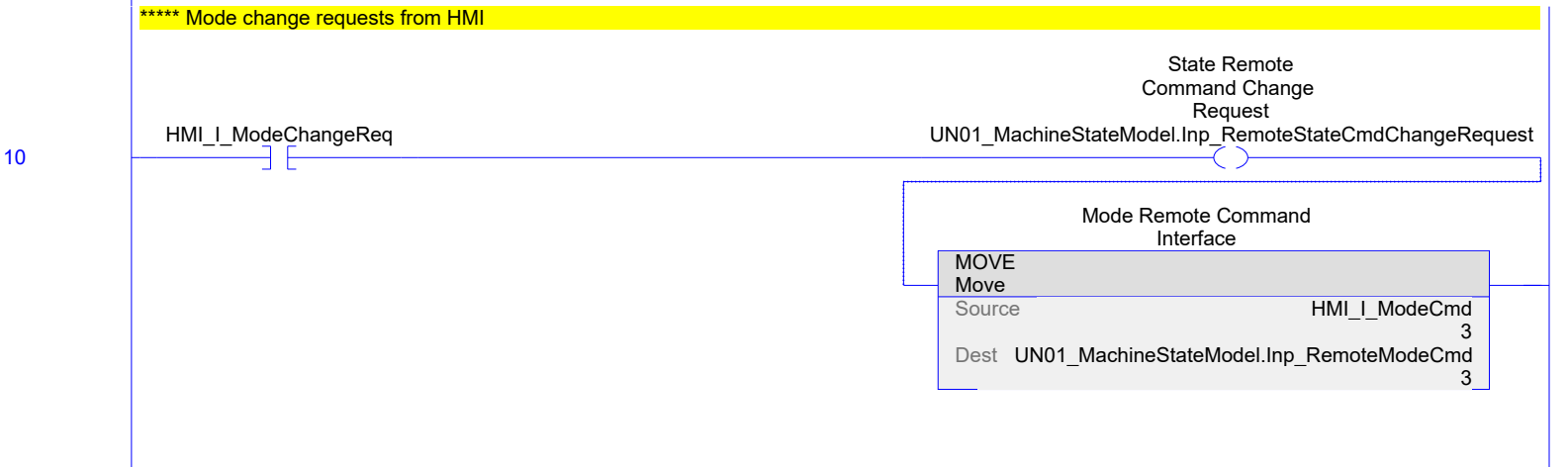




**STATE COMMAND**  
**ABORT**

This Command is Triggered by the Unit Condition Indicating Any Fault Condition Is Present.  
 The Command Initiates in the PackML AOI for the Current Mode Operation Procedure to Transition From the Following List of States (Resetting, Idle, Starting, Execute, Holding, Held, UnHolding, Suspending, Suspended, UnSuspending, Completing, Complete, Stopping, Stopped, Or Clearing),  
 When Each Is Enabled, To:  
 1) The Aborting State, If Aborting is Enabled  
 2) The Aborted State, If Aborting is Disabled

**HINT: MAKE SURE THAT ALL EQUIPMENT MODULES REPORT BACK A FAULTRESET\_DONE AT SOME POINT IN TIME (EVEN IF FAULTS ARE PRESENT) TO AVOID THAT THE STATEMACHINE GETS STUCK IN CLEARING**



**MODE AND STATE MANAGEMENT**

PackML V3.0 Model (Defined By ISA-TR88.00.02)

This Add-On Instruction (AOI) Manages the State Transitions and Configurations for Up To 32 Unit Modes, and the Transitions Between Modes. Only One Mode May Be Active on the Unit At Any Given Time. Each Mode is Executed as an Unique Operation Procedure in a Program Folder in the Controller Organizer.

Use the Configuration Tag Arrays (Prefixes Cfg\_ ) to Setup the Modes and States for the Specific Machine Needs. Each Element of the Array Corresponds to the Configuration for the Mode, Defined by Number. Bits 1-17 of Each Element Corresponds to an Associated State of the Mode.

-- Cfg\_ModeTransitions - DINT[32] - Use to Define Which State(s) Must Be Currently Active to Allow Transition From the Current Mode to the Mode Requested by Cmd\_Mode. Current and Requested Modes Both Need Same State Bit Set. A Mode Transition May Be Requested at Any Time. If the Transition is NOT Allowed, Then the Sts\_ModeChangeNotAllowed Will Be Set To Indicate to the Operator. Transition Occurs by Changing Current Mode to Requested Mode, But Maintains Current State in New Mode.

-- Cfg\_DisableStates - DINT[32] - Use to Define for Each Mode Which State(s) Are Not Necessary to Perform the Associated Operation Procedure. The Stopped, Aborted, and Execute States May NOT Be Disabled. When Online:  
 1) Disabling the Held State Will Automatically Disable the Holding and UnHolding States  
 2) Disabling the Suspended State Will Automatically Disable the Suspending and UnSuspending States  
 3) Disabling the Complete State Will Automatically Disable the Completing State.

-- Cfg\_ModeNames - String\_Short[32] - Use to Associate a Name to Each Mode. A Name is Often More Desirable For Operation and Design, So the Name is Used to Display the Modes on the HMI Application. The String\_Short Data Type is Defined for 12 Characters. This Minimizes the Memory Impact of the Strings, But This May Be Expanded If Required for Your Application

Command Parameters (Prefixes Cmd\_ ) Initiate Either Mode or State Transitions. Cmd\_Mode Requests the Mode Using an Integer Value. The State Transition Commands Are Boolean Parameters to Initiate State Transitions. The Cmd\_StateComplete Bit is Used Transition All Acting and Dual States Upon Completion of State Sequence. This Is REQUIRED for ALL Acting States, But Only Used for the Dual State (Execute) If Complete Is Enabled.

Status Parameters (Prefixes Sts\_ ) Indicate the Current State By Boolean Bit and String Name, the Enabled States for the Current Mode, And the Current Mode by String Name. These Are Used By the Logic and HMI for Display and Decision-Making

PackML State Complete Command - Latch  
 Cmd\_StateComplete to allow transition from acting state to wait state

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PackMLv3_StateModel	
PackMLv3_StateModel	UN01_MachineStateModel
Cfg_ModeTransitions	Cfg_ModeTransitions
Cfg_DisableStates	Cfg_DisableStates
Cfg_ModeNames	Cfg_ModeNames
Cmd_Mode	3
Cmd_Reset	0
Cmd_Start	0
Cmd_Stop	0
Cmd_Hold	0
Cmd_UnHold	0
Cmd_UnSuspend	0
Cmd_Suspend	0
Cmd_UnSuspend	0
Cmd_Abort	0
Cmd_Clear	0
Cmd_StateComplete	0
Sts_StateCurrentName	HMI_O_StateCurrentName
Sts_ModeCurrentName	HMI_O_ModeCurrentName

- (Sts\_ModeChangeNotAllowed)
- (Sts\_Clearing)
- (Sts\_Stopped)
- (Sts\_Starting)
- (Sts\_Idle)
- (Sts\_Suspended)
- (Sts\_Execute)
- (Sts\_Stopping)
- (Sts\_Aborting)
- (Sts\_Aborted)
- (Sts\_Holding)
- (Sts\_Held)
- (Sts\_UnHolding)
- (Sts\_Suspending)
- (Sts\_UnSuspending)
- (Sts\_Resetting)
- (Sts\_Completing)
- (Sts\_Complete)

UN01\_MachineStateModel.Cmd\_StateComplete (U)

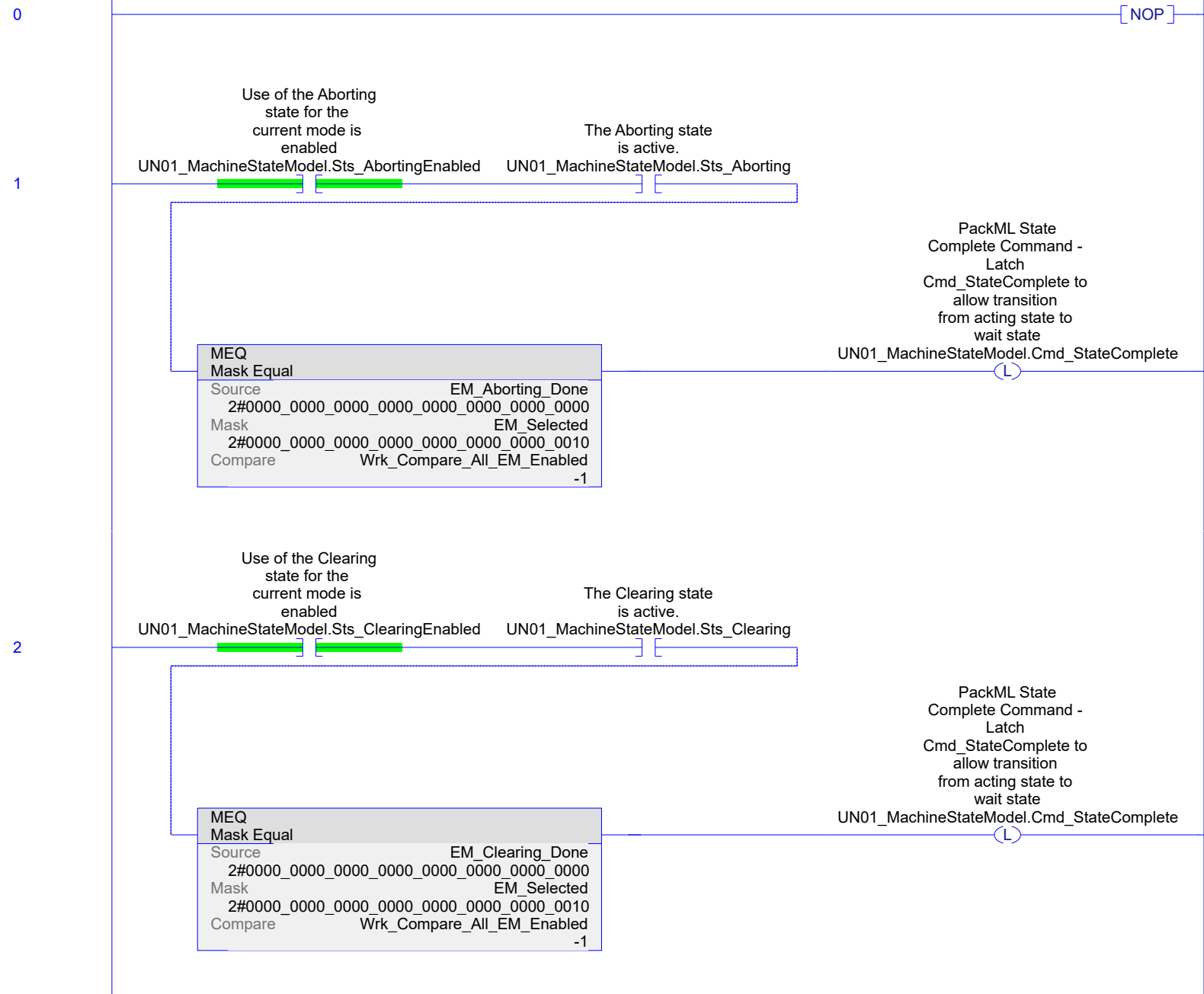
Signature ID: 13B69801

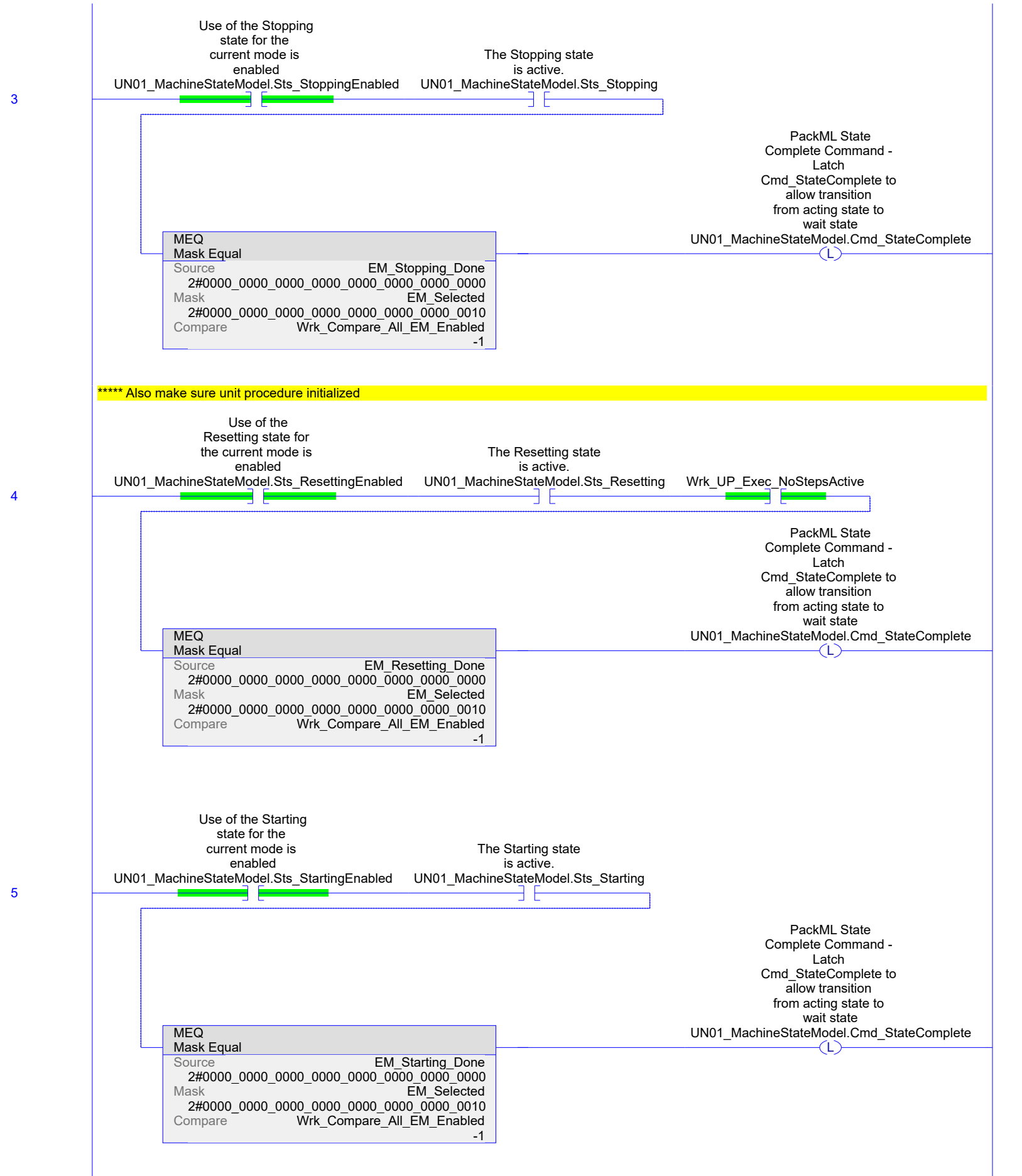
(End)

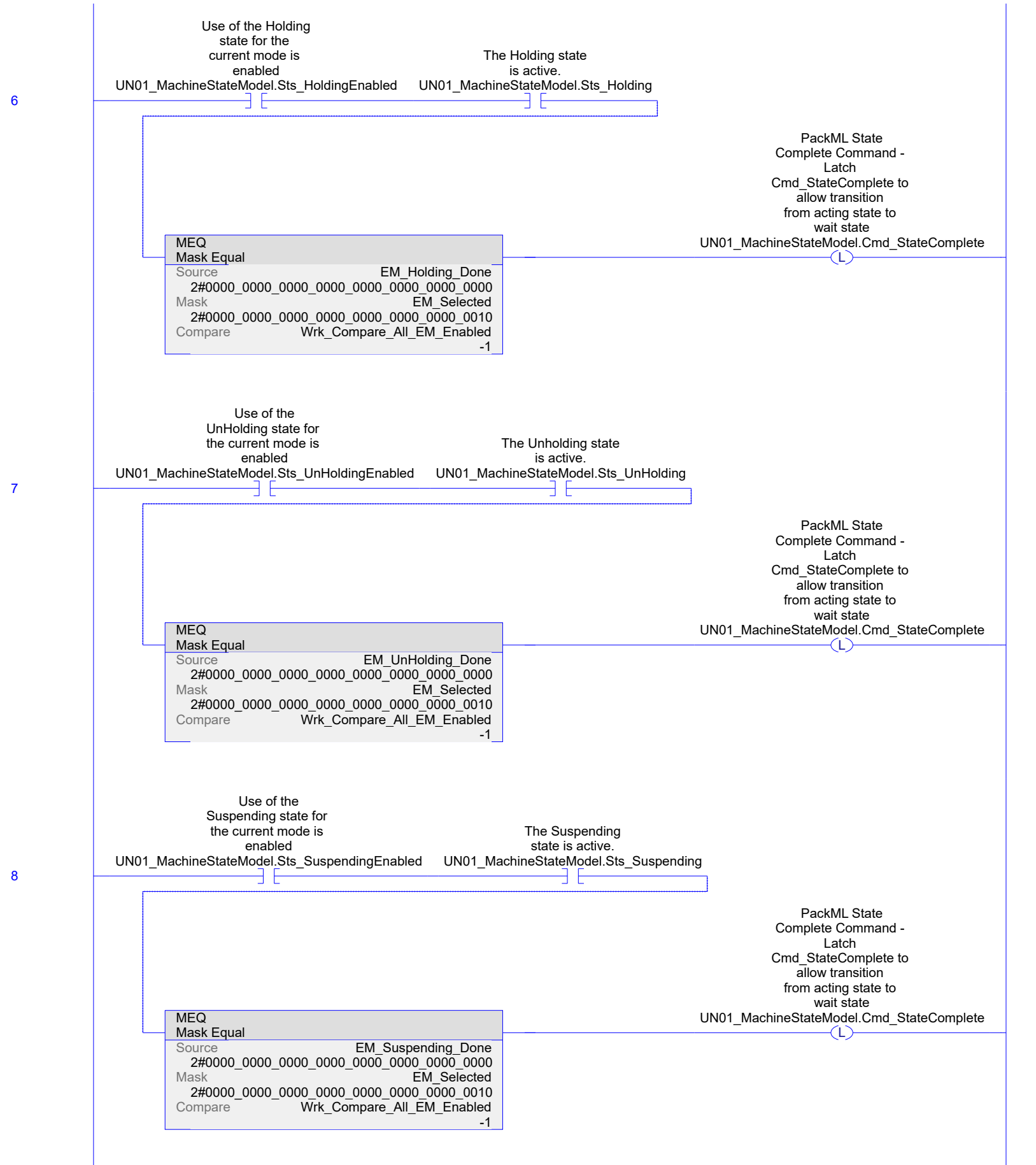
```

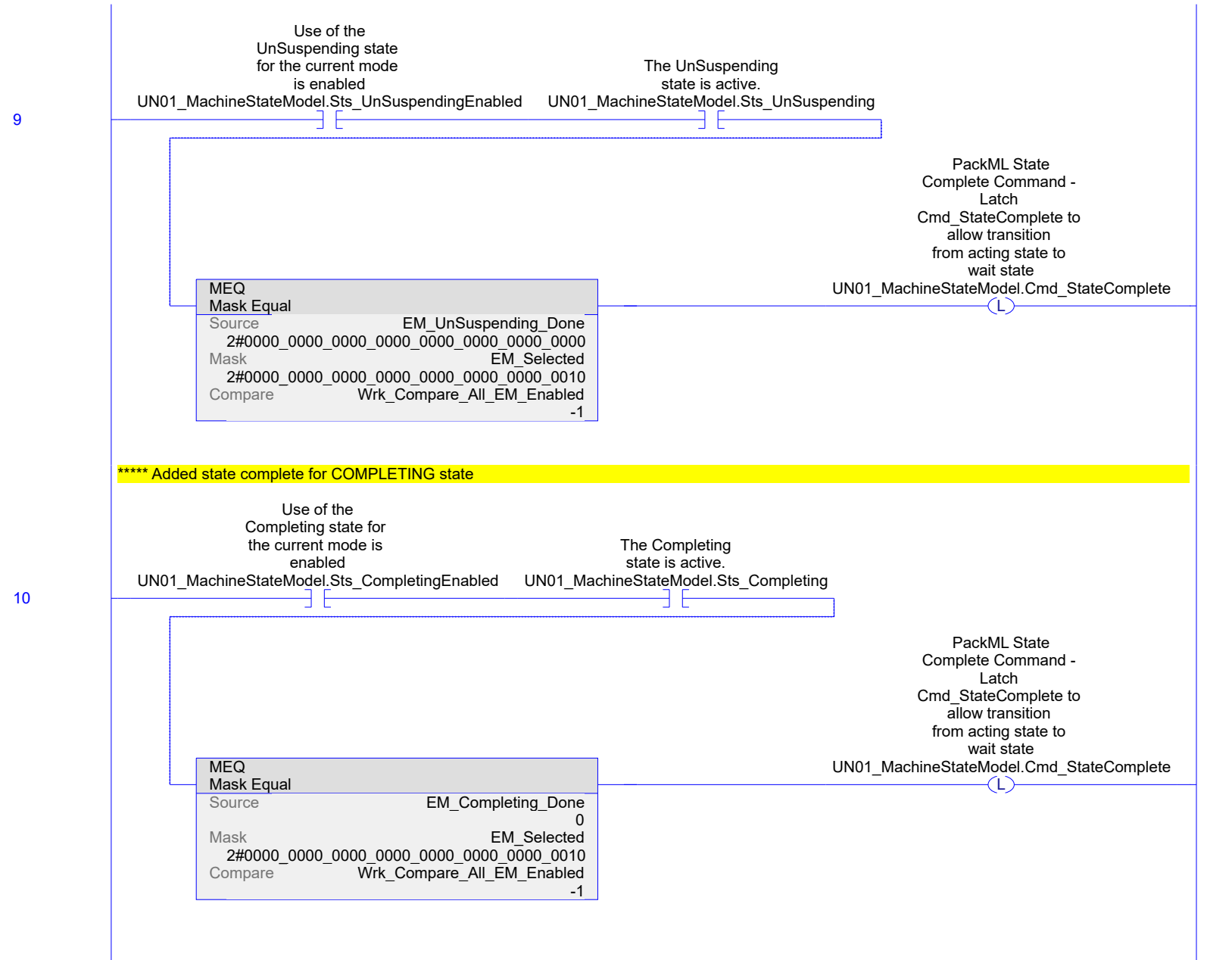
    //////////////////////////////////////
    COMPANY:      Rockwell Automation
    FUNCTION:     Procedural Routine - State Complete Verification for Equipment Modules
    AUTHOR:      Rockwell Automation
    DATE CREATED: March 2011

    Version Comments:
    //////////////////////////////////////
    
```



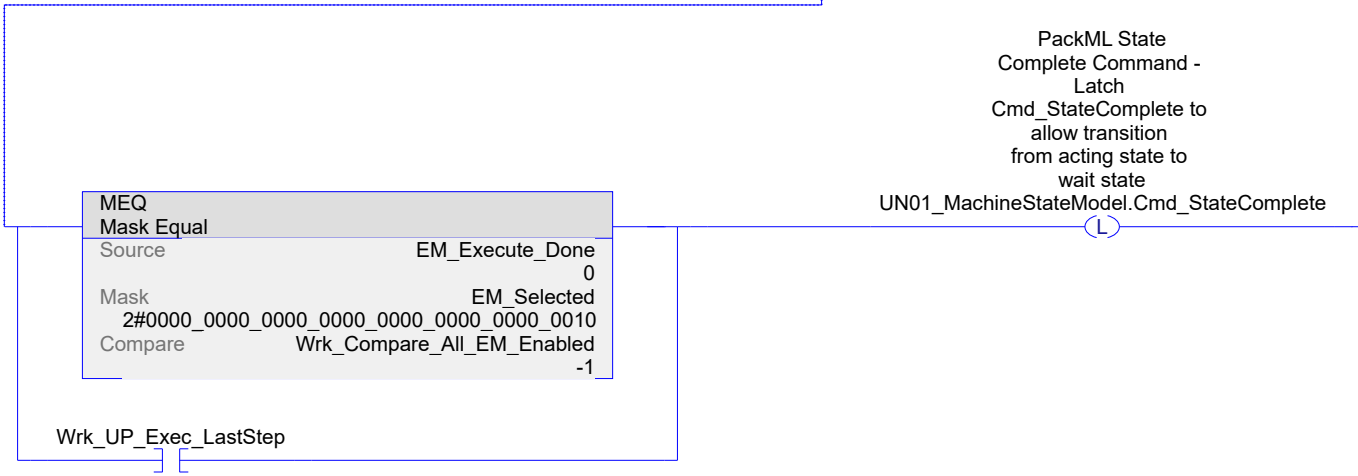






\*\*\*\*\* Added state complete for EXECUTE state. Complete when all EM's complete, or when unit procedure finished.

11

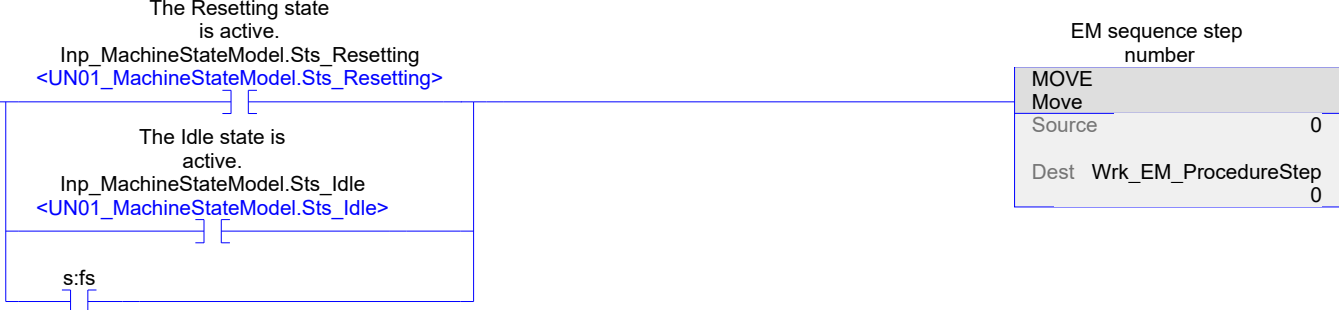


(End)

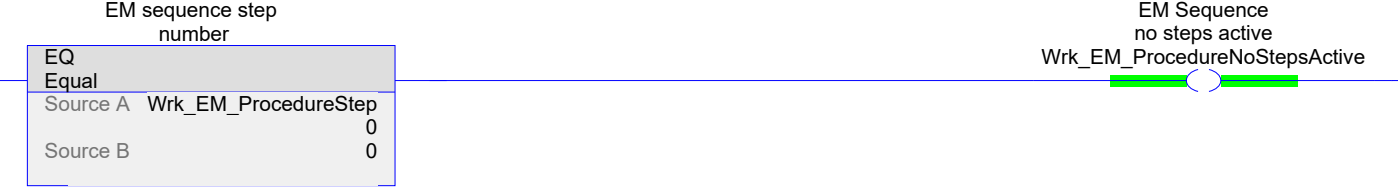
\*\*\*\*\* Added rungs 0 to 11 for sequence-related commands from unit procedure  
 EXECUTE State motion steps/commands  
 ++++++

0 [NOP]

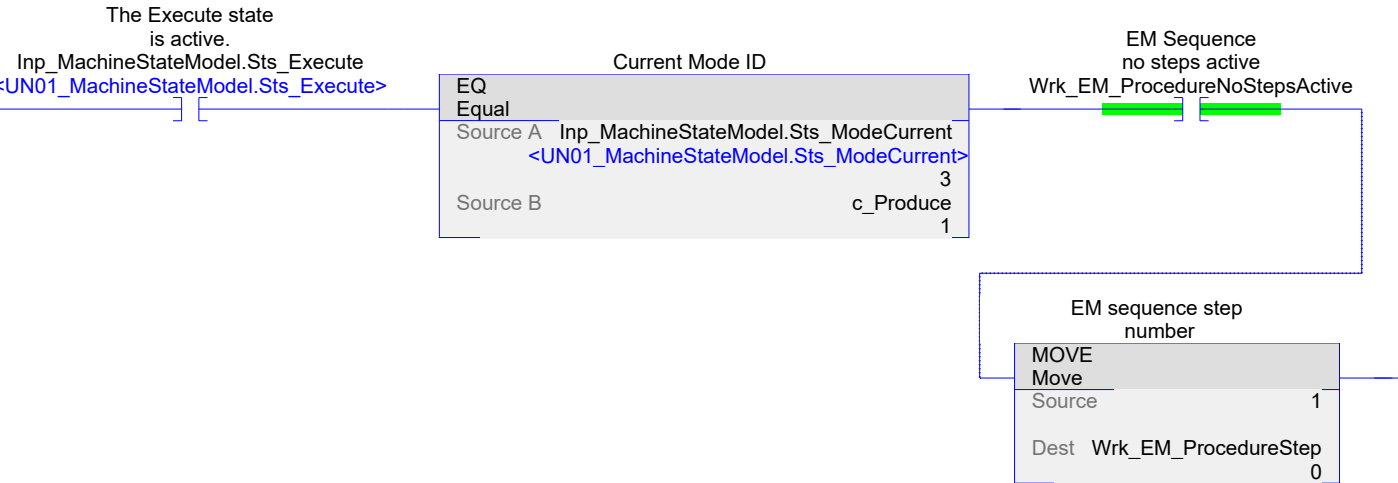
Resetting or idle - clear EM procedure step number



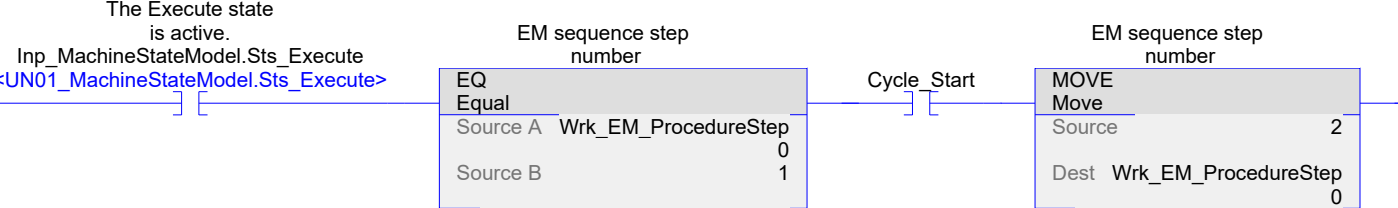
Indication that all steps reset.  
 Used by RESETTING state and initial execute step



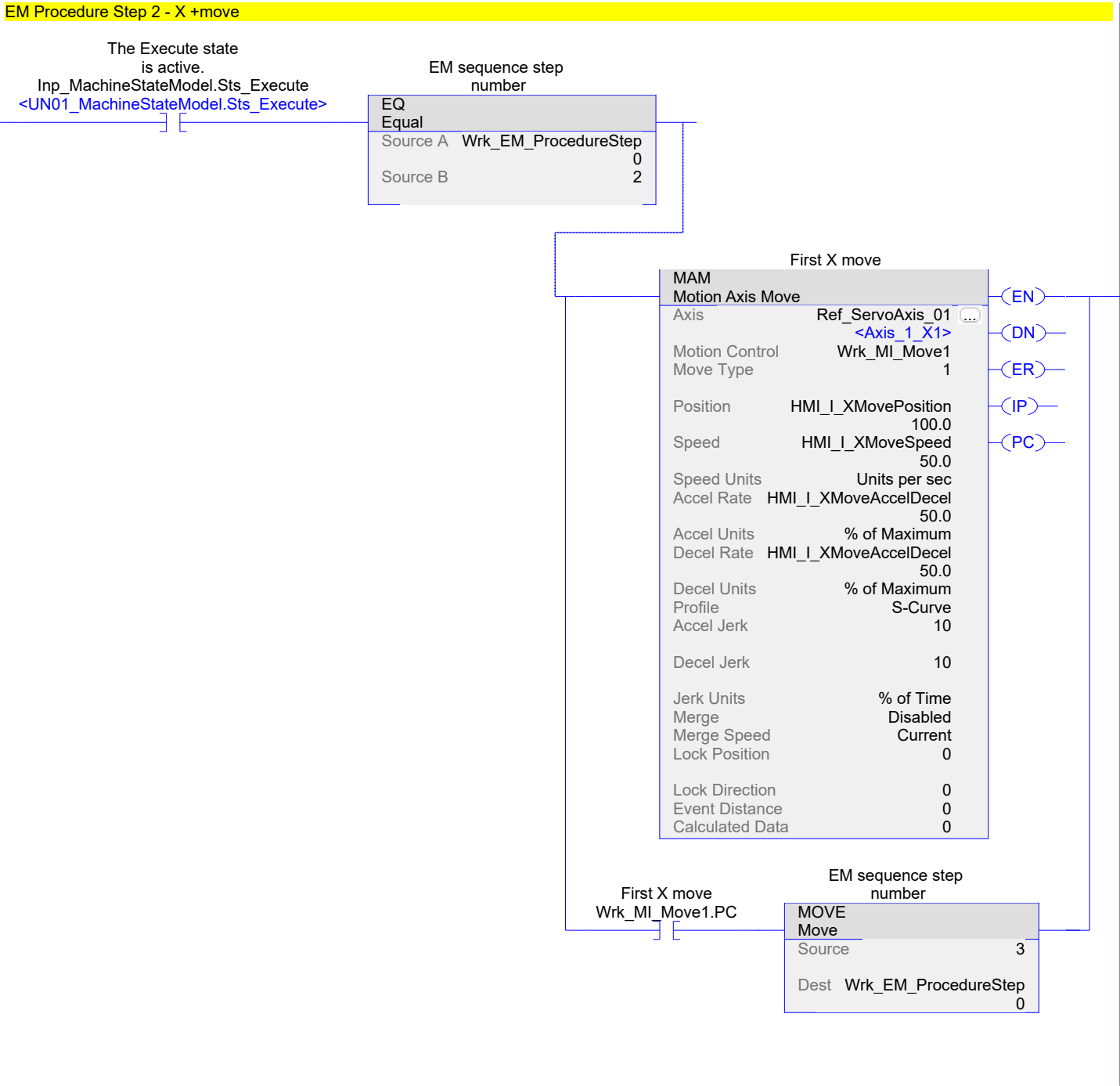
EXECUTE - Start sequence if Execute active in Produce mode and no steps active.



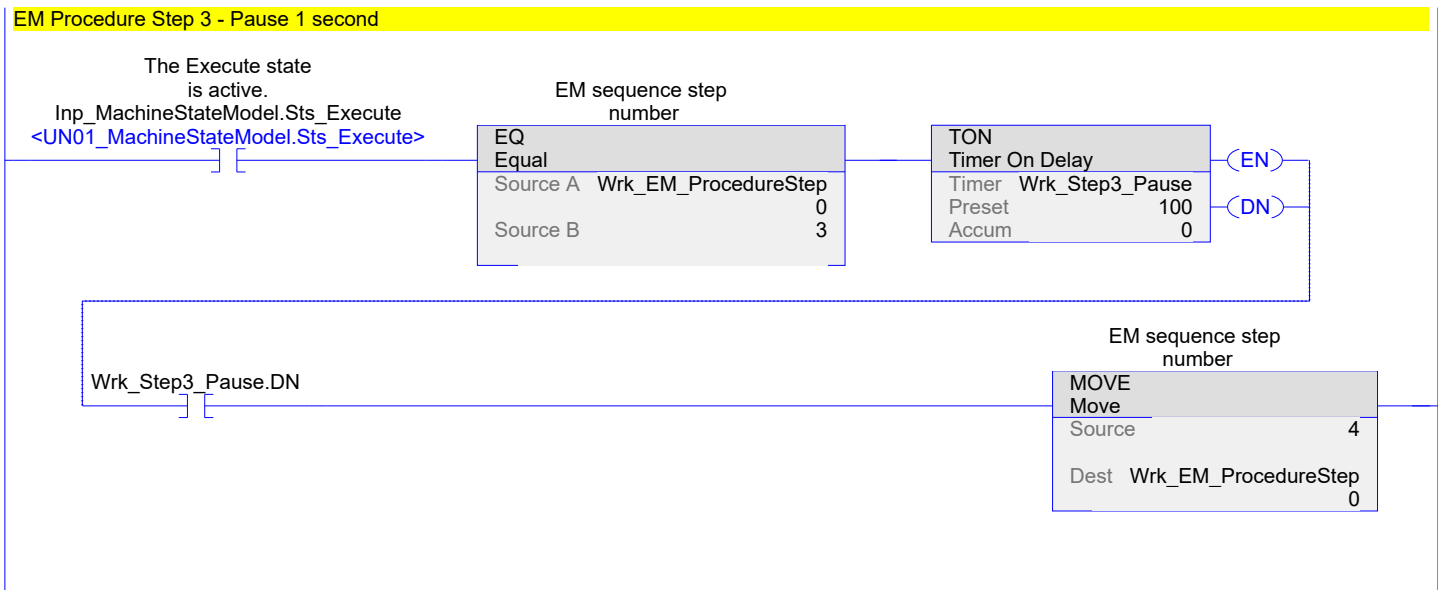
Em Procedure Step 1 - Wait for Cycle\_Start signal

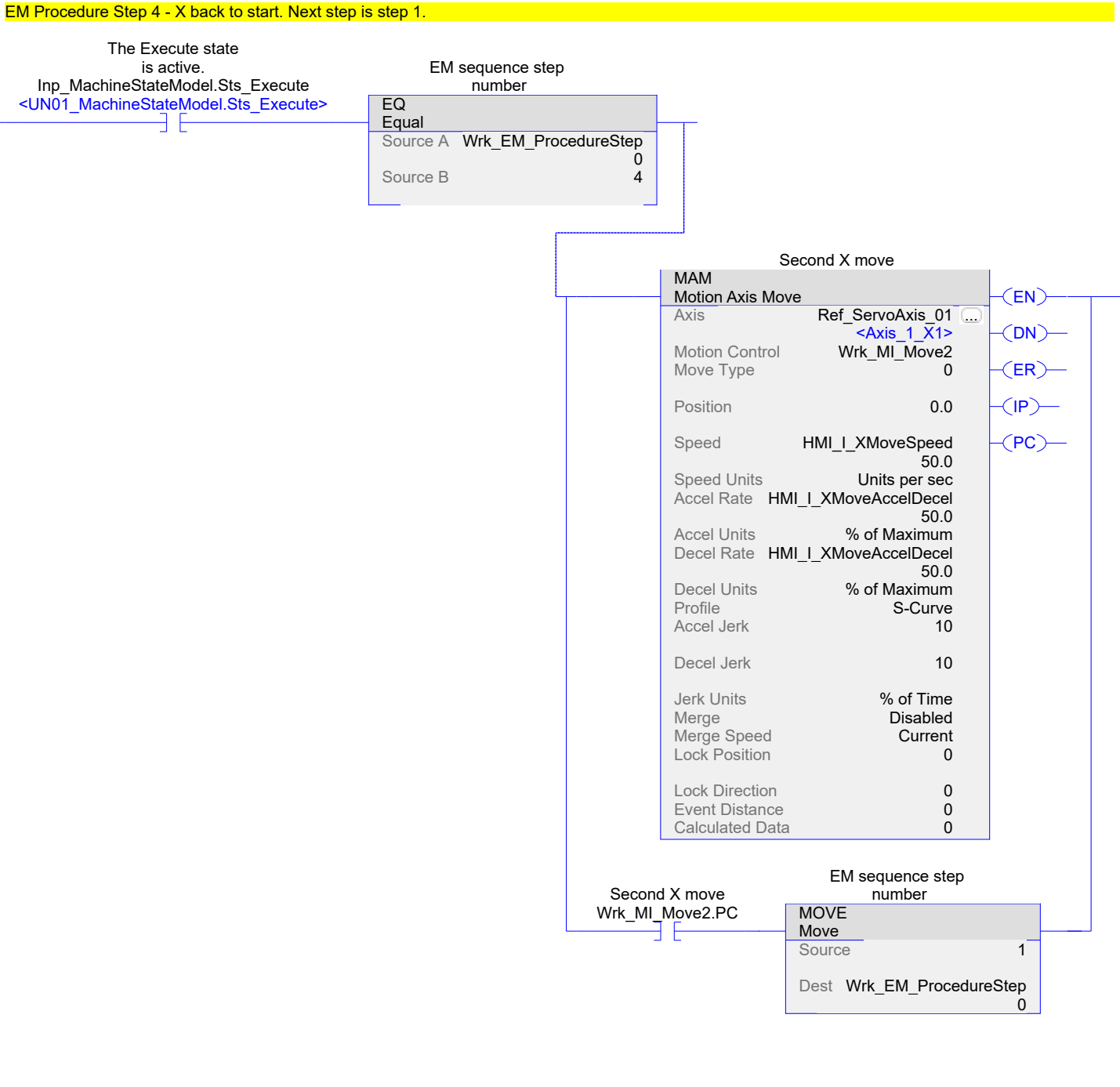


5



6





Motion instruction errors. Save error codes to be copied to stored EM fault information.

8

First X move  
Wrk\_MI\_Move1.ER

MOVE
Move
Source Wrk_MI_Move1.ERR
0
Dest Wrk_EM_Procedure_MI_Err
0

MOVE
Move
Source Wrk_MI_Move1.EXERR
0
Dest Wrk_EM_Procedure_MI_ExErr
0

Wrk\_Ons\_MoveErr  
[ONS]

Second X move  
Wrk\_MI\_Move2.ER

MOVE
Move
Source Wrk_MI_Move2.ERR
0
Dest Wrk_EM_Procedure_MI_Err
0

MOVE
Move
Source Wrk_MI_Move2.EXERR
0
Dest Wrk_EM_Procedure_MI_ExErr
0

The Clearing state  
is active.  
Inp\_MachineStateModel.Sts\_Clearing  
<UN01\_MachineStateModel.Sts\_Clearing>

EM Sequence move  
instr error  
Wrk\_EM\_ProcedureFault

(End)

```
////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////  
////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////  
  
SECTION EQUIPMENT MODULE STATE COMPLETE HANDLING - SET DONE BITS  
  
ALSO EM STATUS conditions that are a combination of axis conditions  
  
////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////  
////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
```

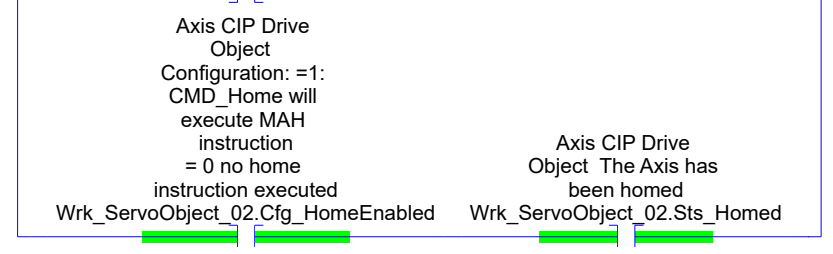
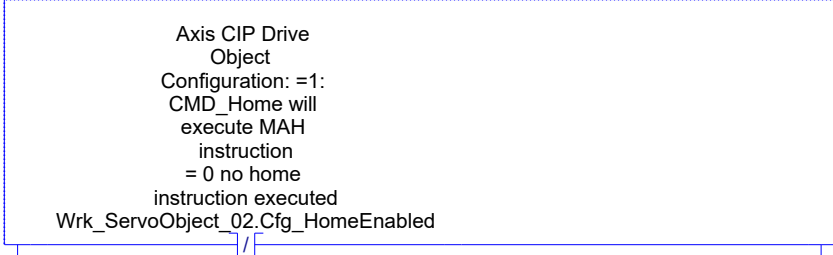
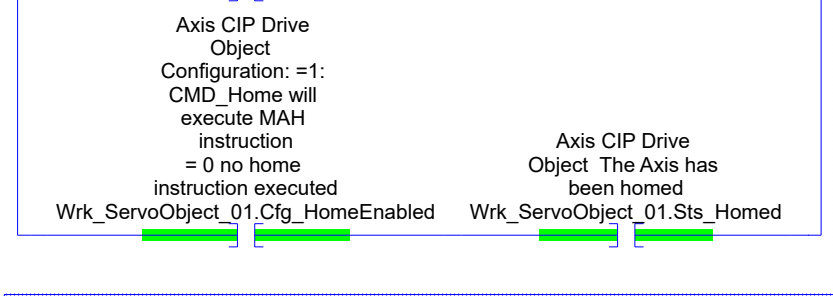
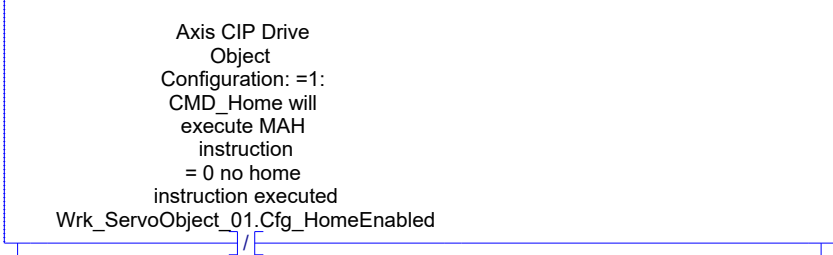
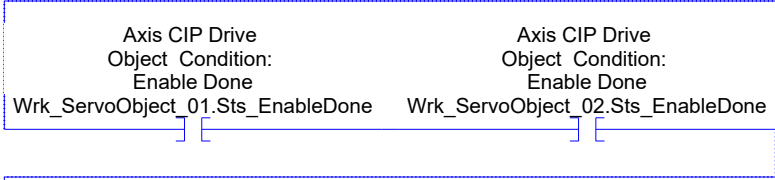
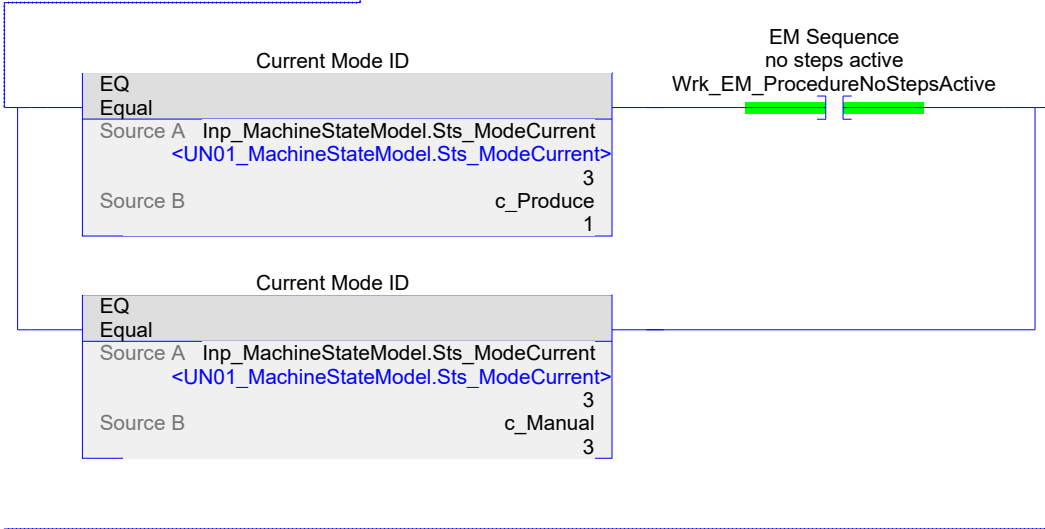
0

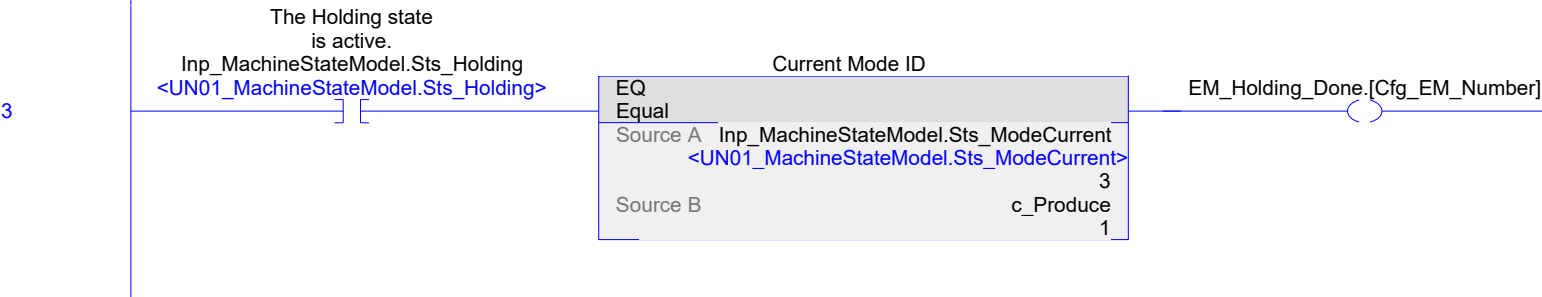
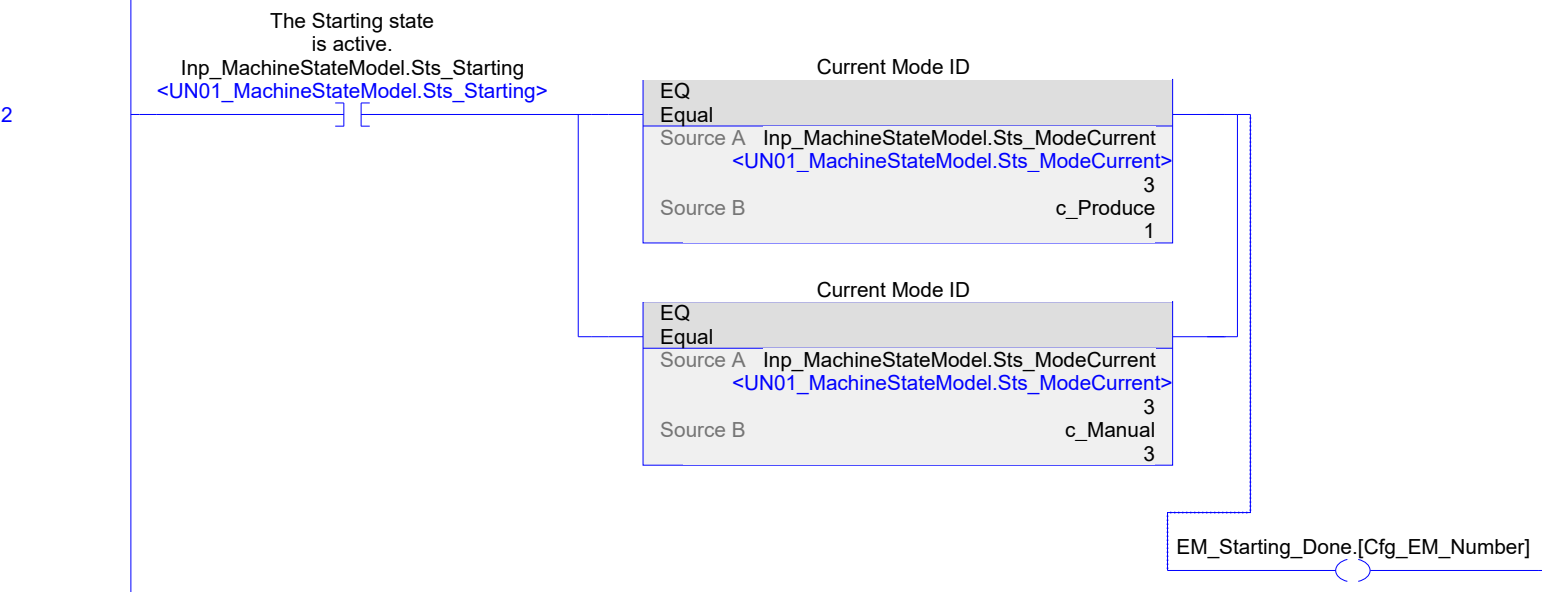
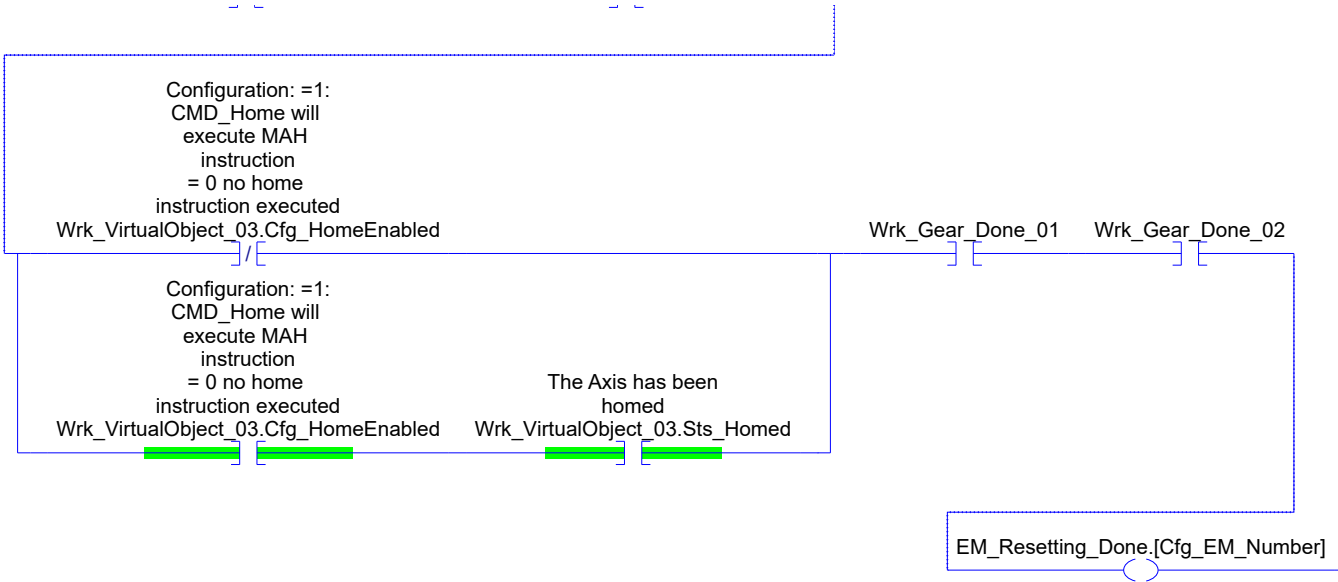
[NOP]

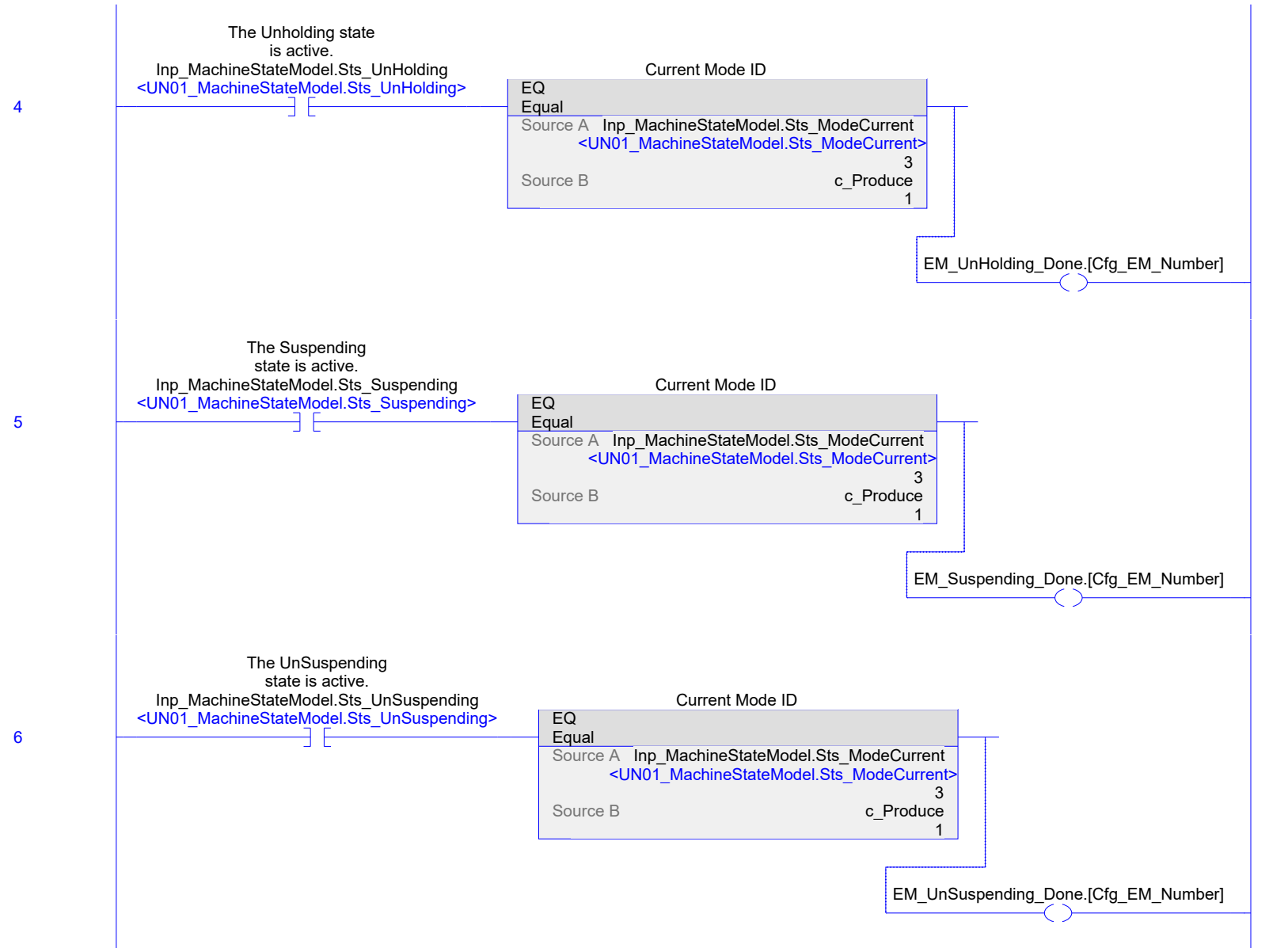
\*\*\*\*\* Added additional conditions for Producing - EM procedure steps not active and homing finished if homing enabled

1

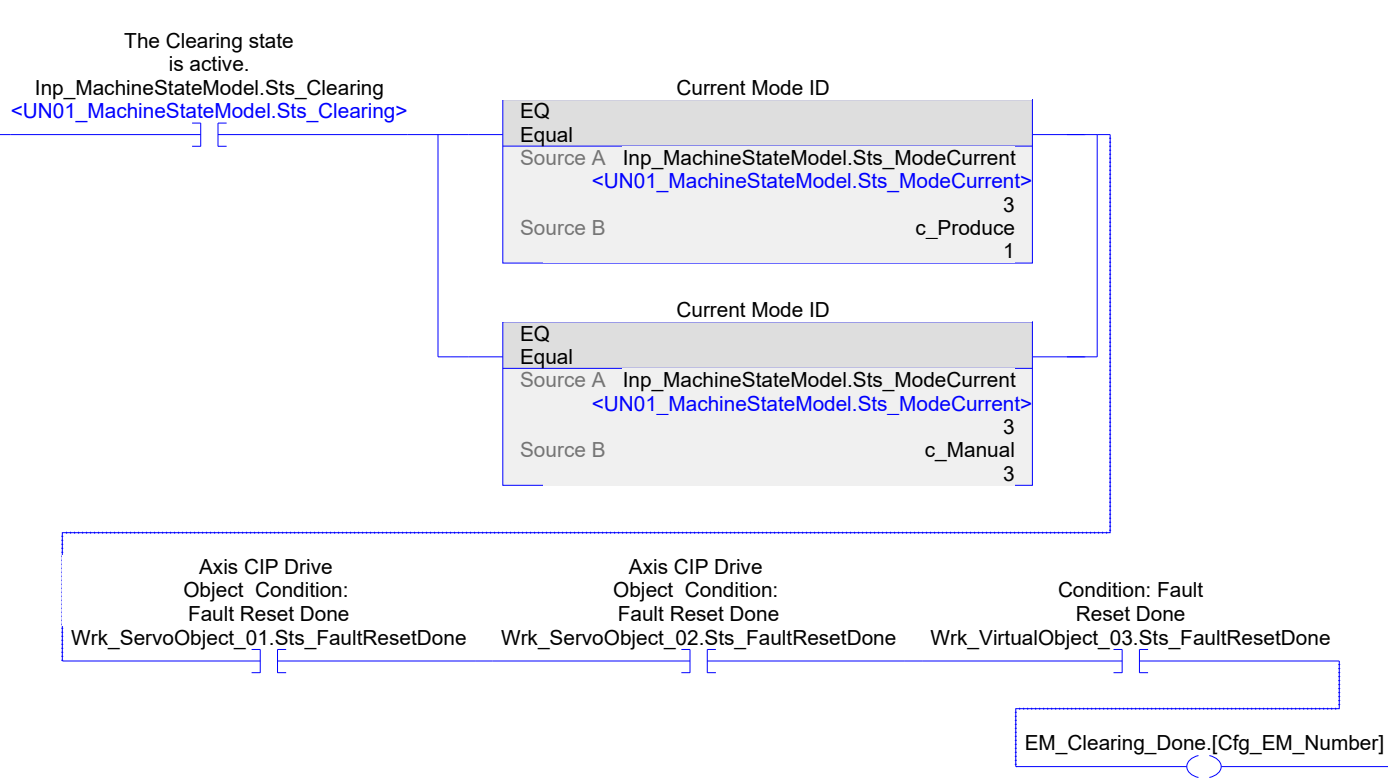
The Resetting state  
 is active.  
 Inp\_MachineStateModel.Sts\_Resetting  
 <UN01\_MachineStateModel.Sts\_Resetting>



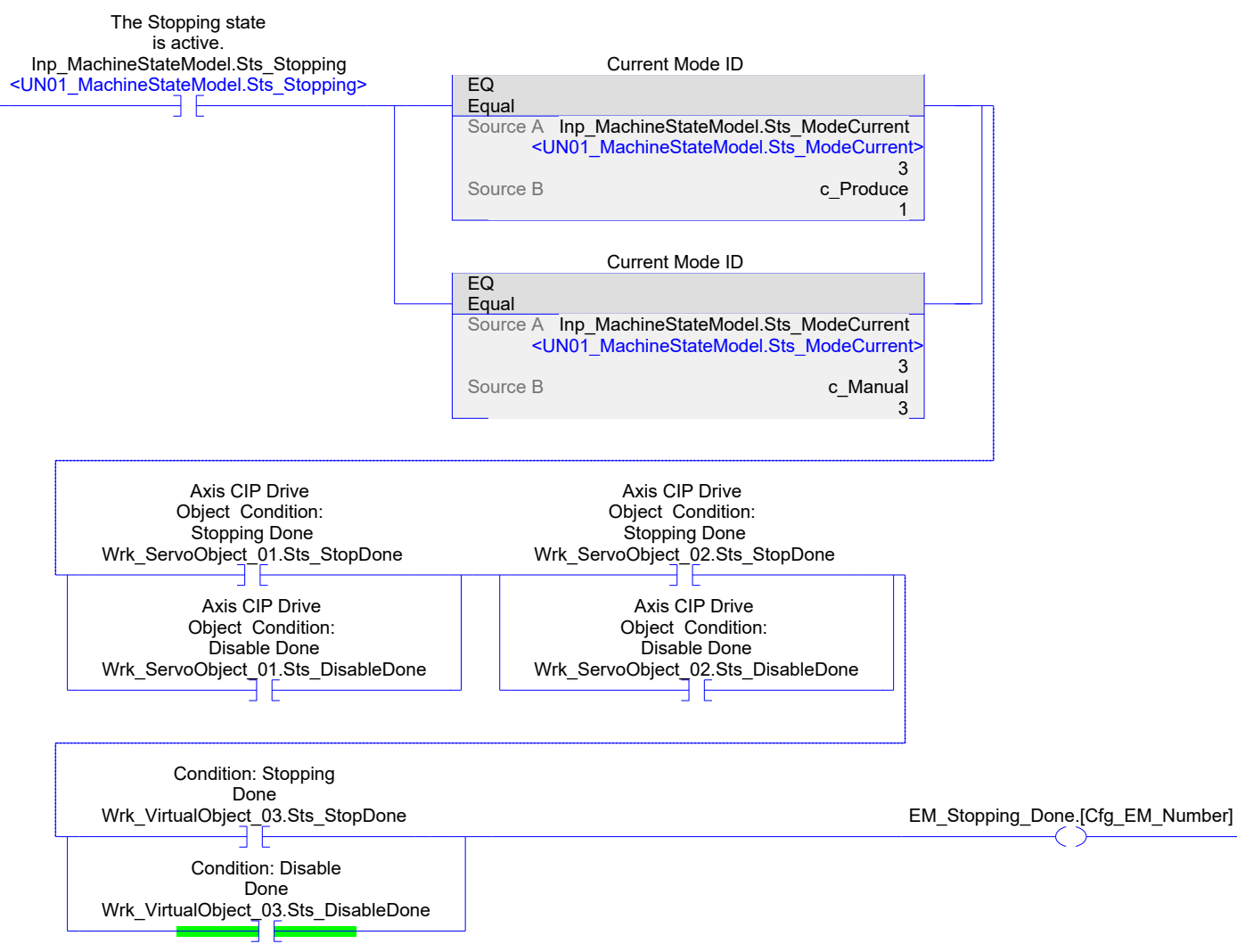


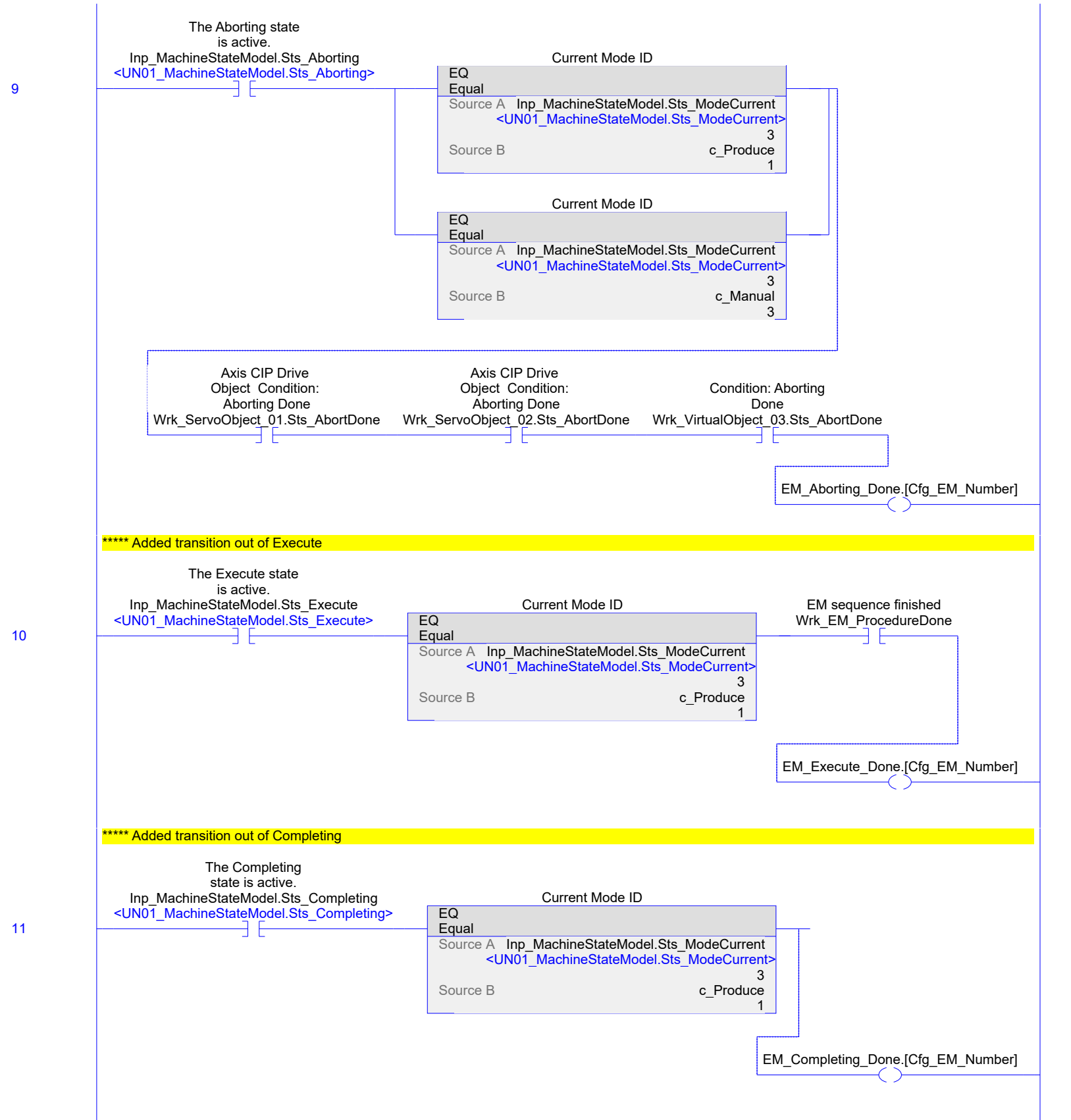


7



8

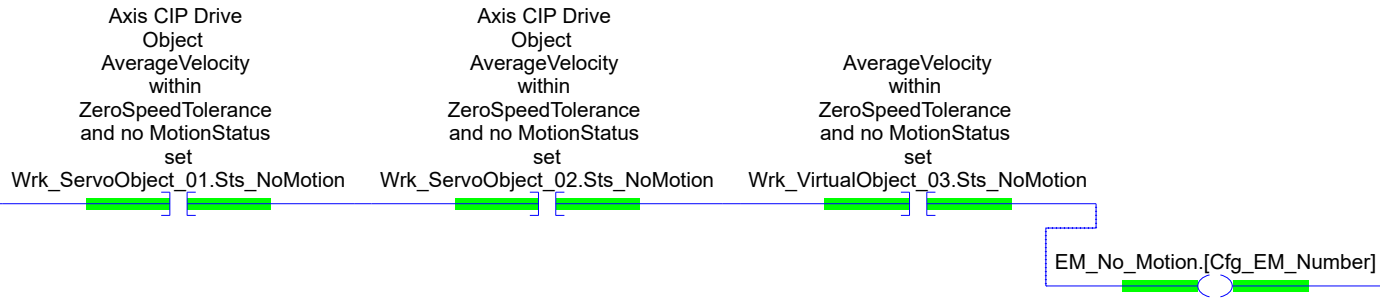




THIS SECTION PROVIDE STATUS INFORMATIONS

12

(End)



```

////////////////////////////////////
COMPANY:      Rockwell Automation
FUNCTION:     Servo Axis Object
AUTHOR:      Rockwell Automation / Kelvin Erickson
DATE CREATED: July 2017

Version Comments: Deleted rung 1 in original CM02_ServoAxisObject getting motion status from master axis
                  Moved rungs dealing with command inputs to Axis_ObjectCD AOI from PP example CM00_Procedure into here.
                  Added "_1" suffix to axis-related tags in preparation to add second axis to EM
2021-06-08    Master axis logic added
////////////////////////////////////

```

[NOP]

Use a master axis

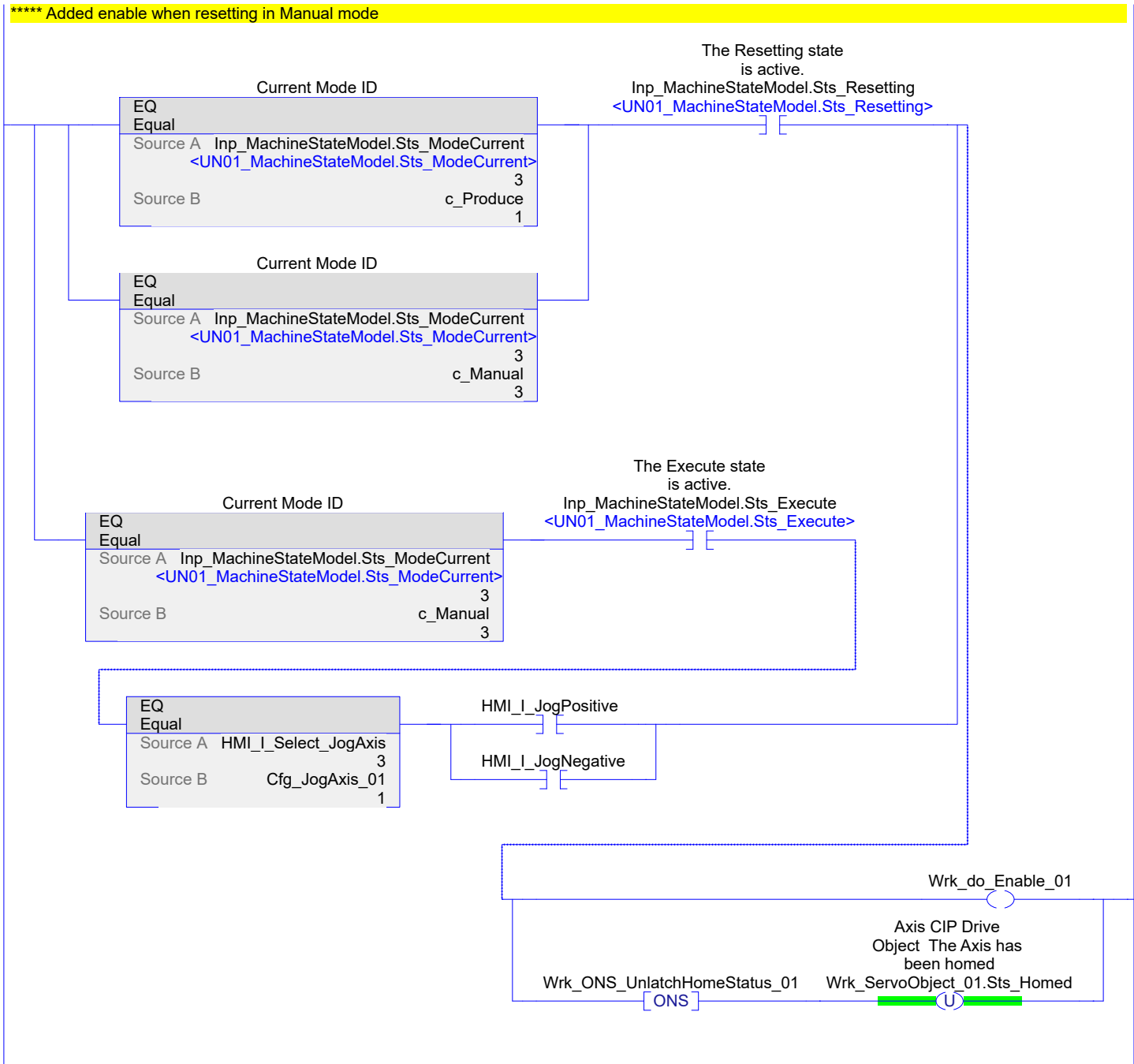
AverageVelocity  
within  
ZeroSpeedTolerance  
and no MotionStatus  
set  
Wrk\_VirtualObject\_03.Sts\_NoMotion

Axis CIP Drive  
Object If  
Cfg\_UseVirtualMaster  
=1: Abort, Stop will  
wait for  
Inp\_MasterNoMotion  
before executing MAS  
instruction  
Wrk\_ServoObject\_01.Inp\_MasterNoMotion

0

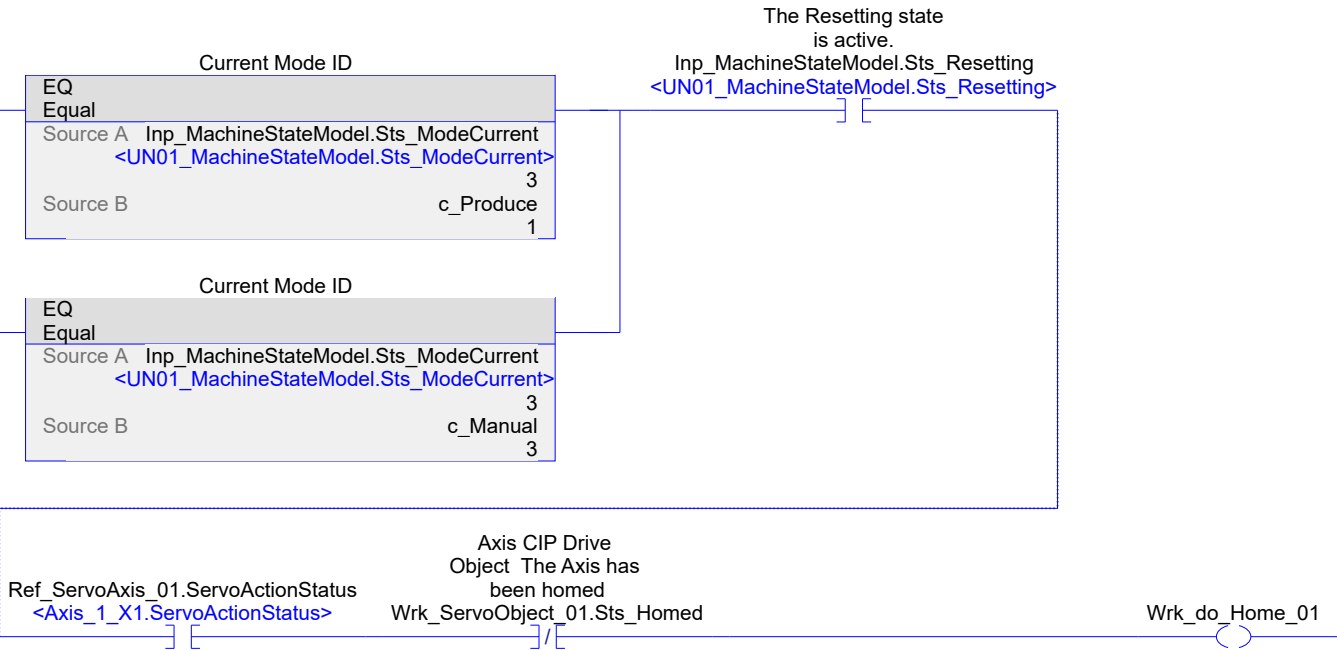
1

2



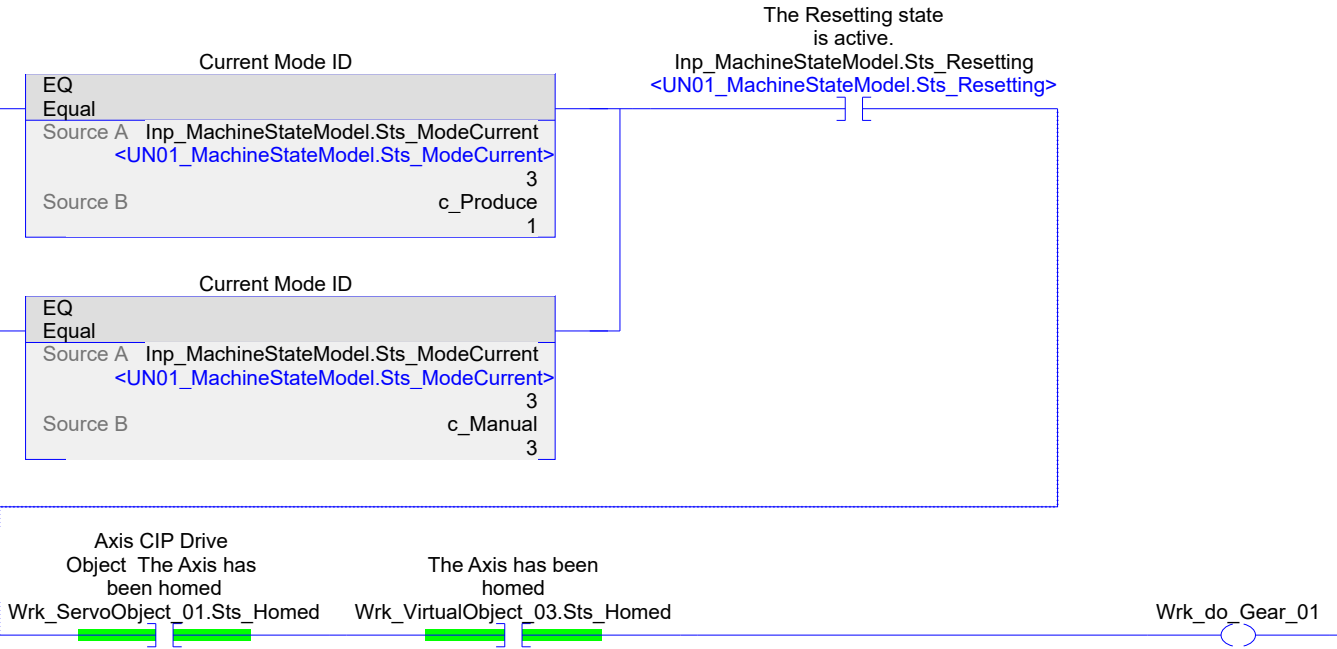
Homing logic

3



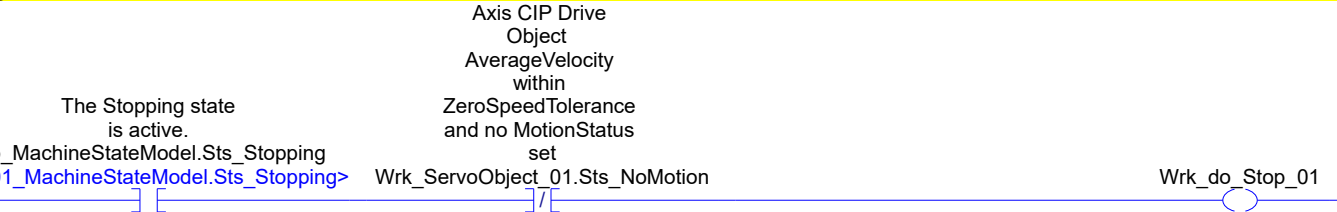
Gear to master axis when master axis is homed

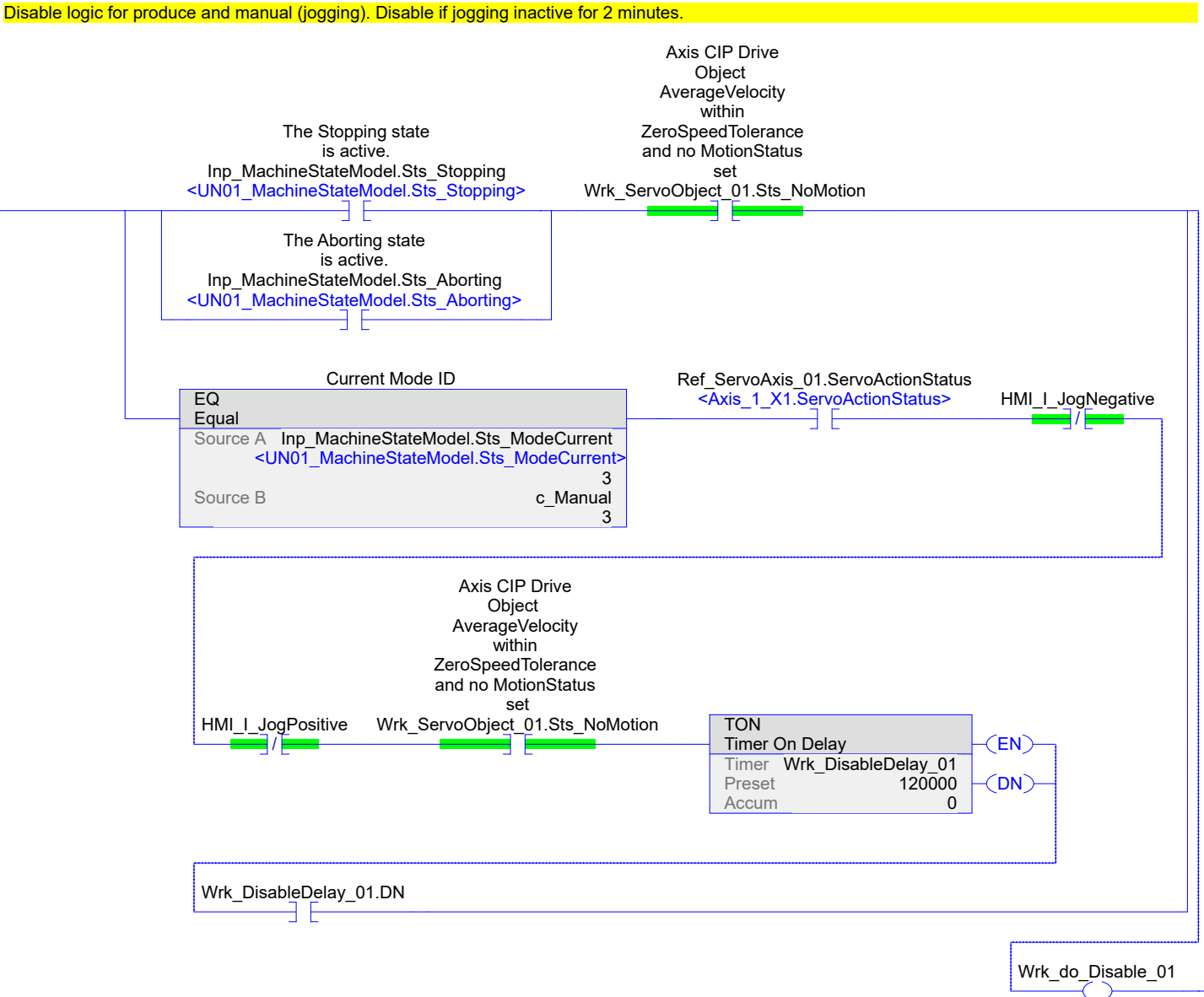
4



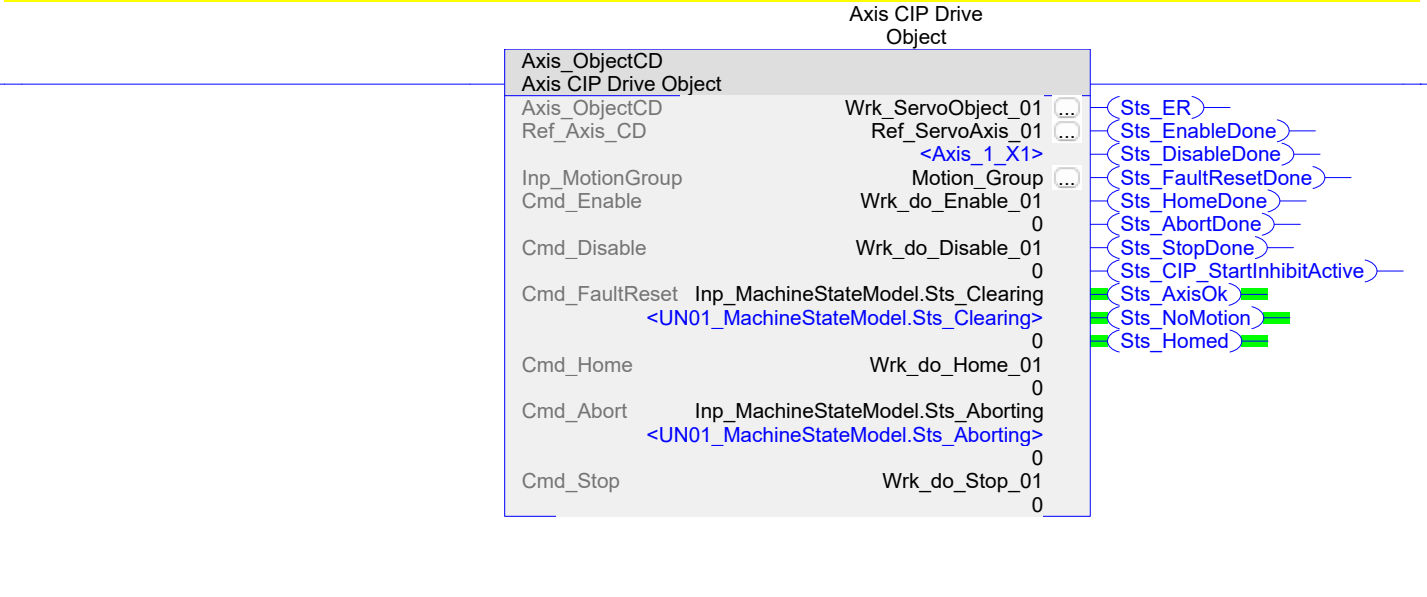
Stop logic

5





SERVO AXIS OBJECT





```

////////////////////////////////////
COMPANY:      Rockwell Automation
FUNCTION:     Servo Axis Object
AUTHOR:      Rockwell Automation / Kelvin Erickson
DATE CREATED: July 2017

Version Comments: Deleted rung 1 in original CM02_ServoAxisObject getting motion status from master axis
                  Moved rungs dealing with command inputs to Axis_ObjectCD AOI from PP example CM00_Procedure into here.
                  Added "_2" suffix to axis-related tags in preparation to move routine to another EM
////////////////////////////////////
    
```

[NOP]

**Use a master axis**

```

AverageVelocity
  within
ZeroSpeedTolerance
and no MotionStatus
  set
Wrk_VirtualObject_03.Sts_NoMotion
    
```

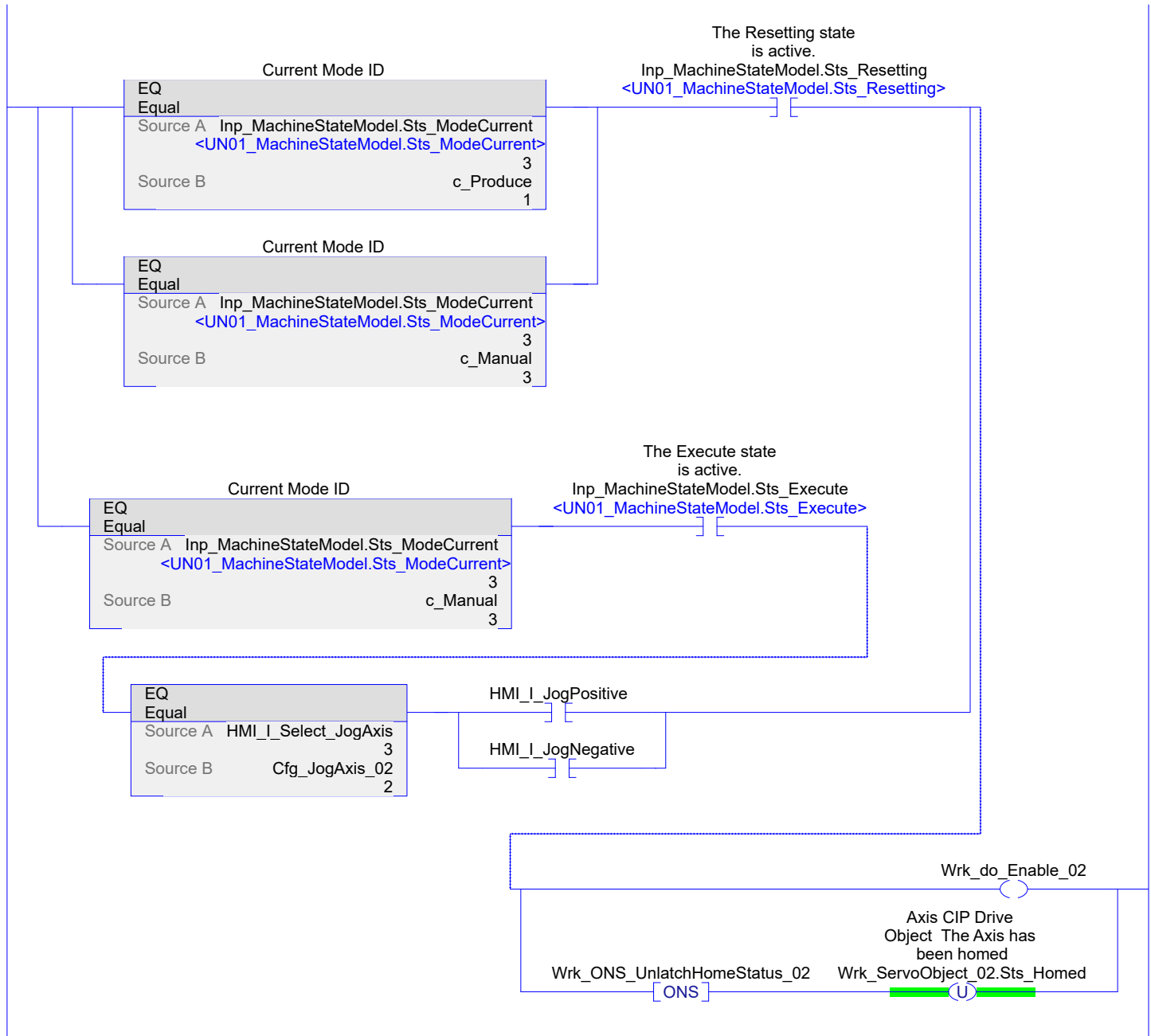
```

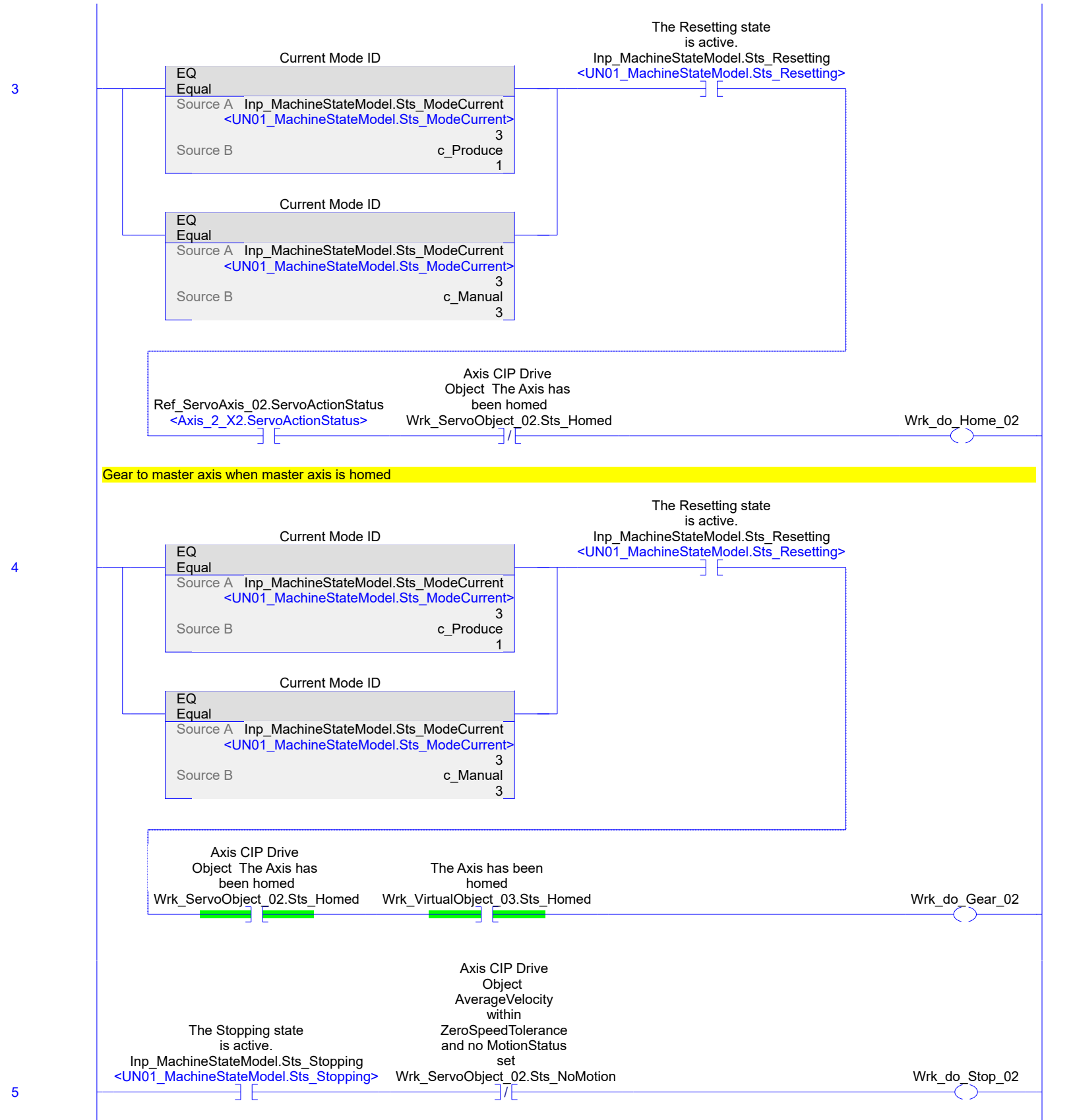
Axis CIP Drive
Object If
Cfg_UseVirtualMaster
=1: Abort, Stop will
  wait for
Inp_MasterNoMotion
before executing MAS
  instruction
Wrk_ServoObject_02.Inp_MasterNoMotion
    
```

0

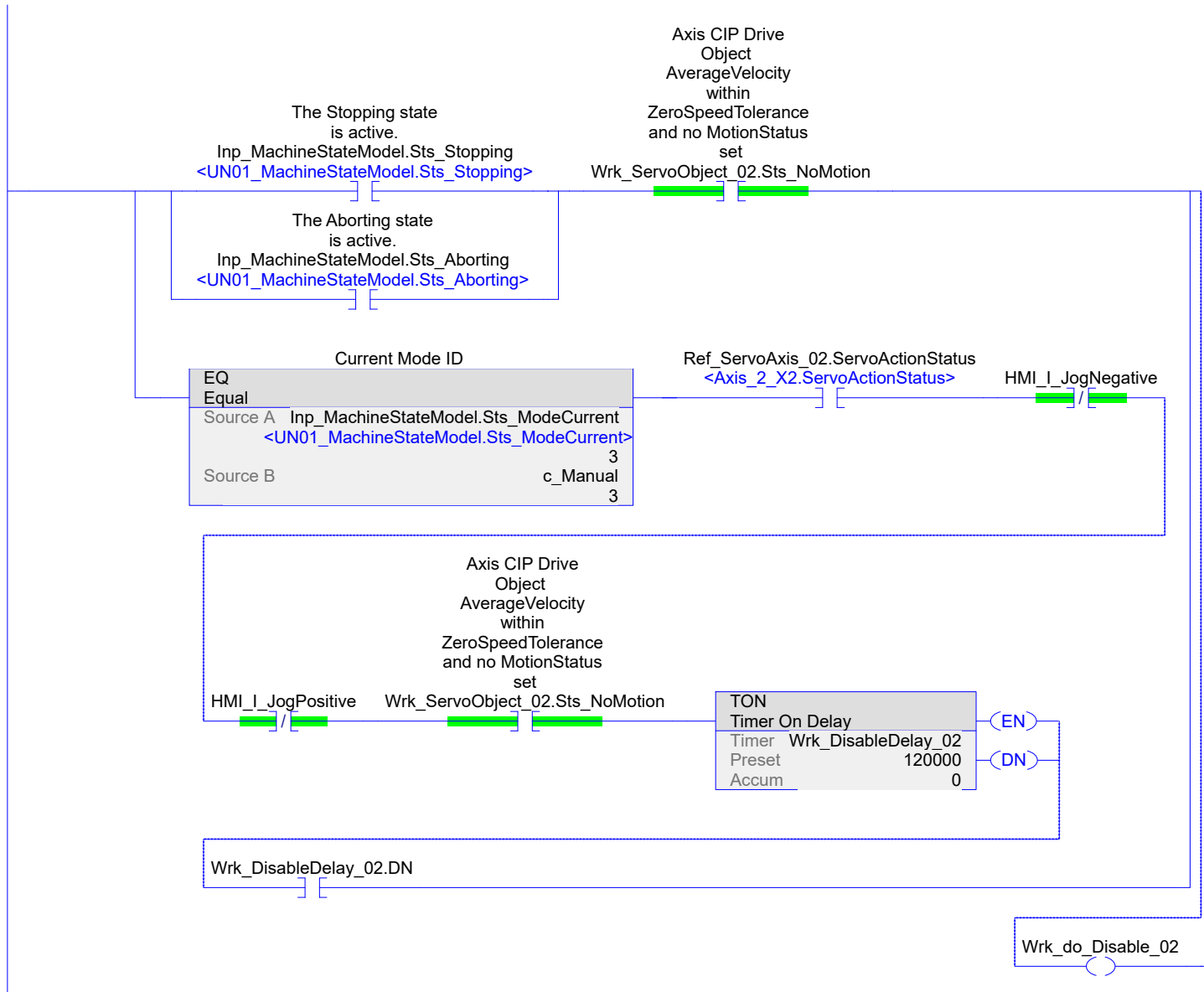
1

2



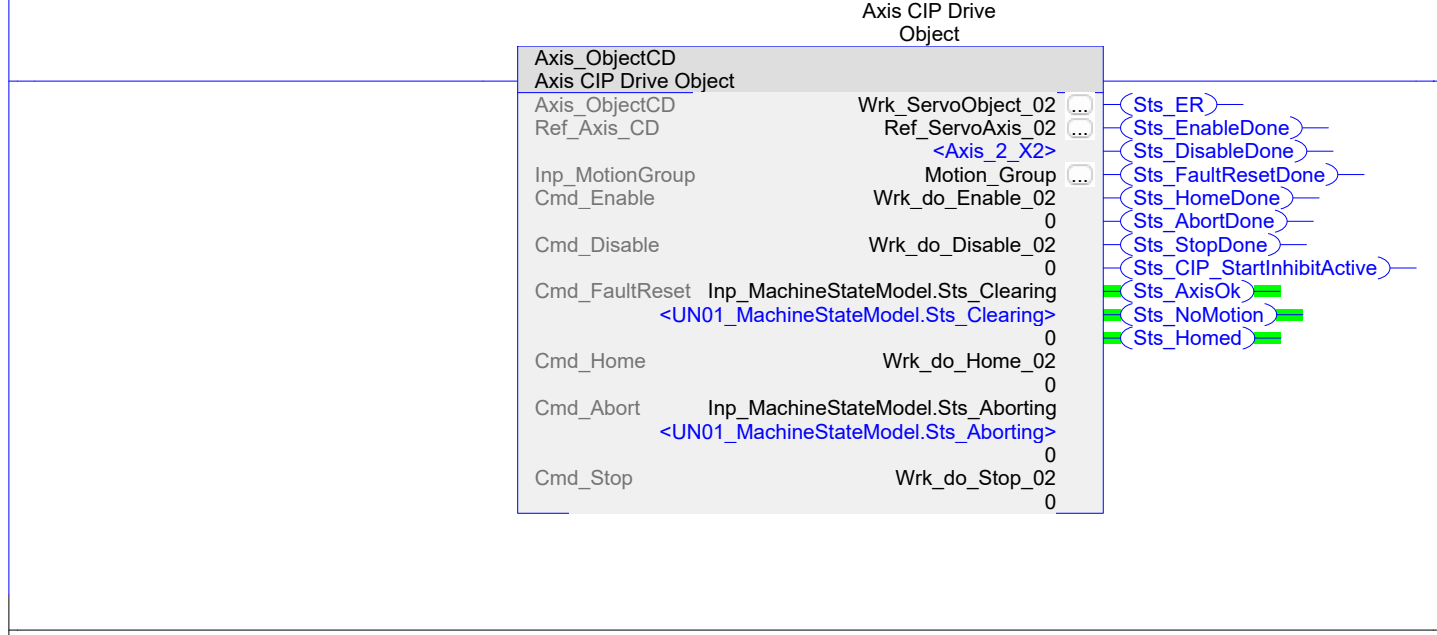


6



7

**SERVO AXIS OBJECT**



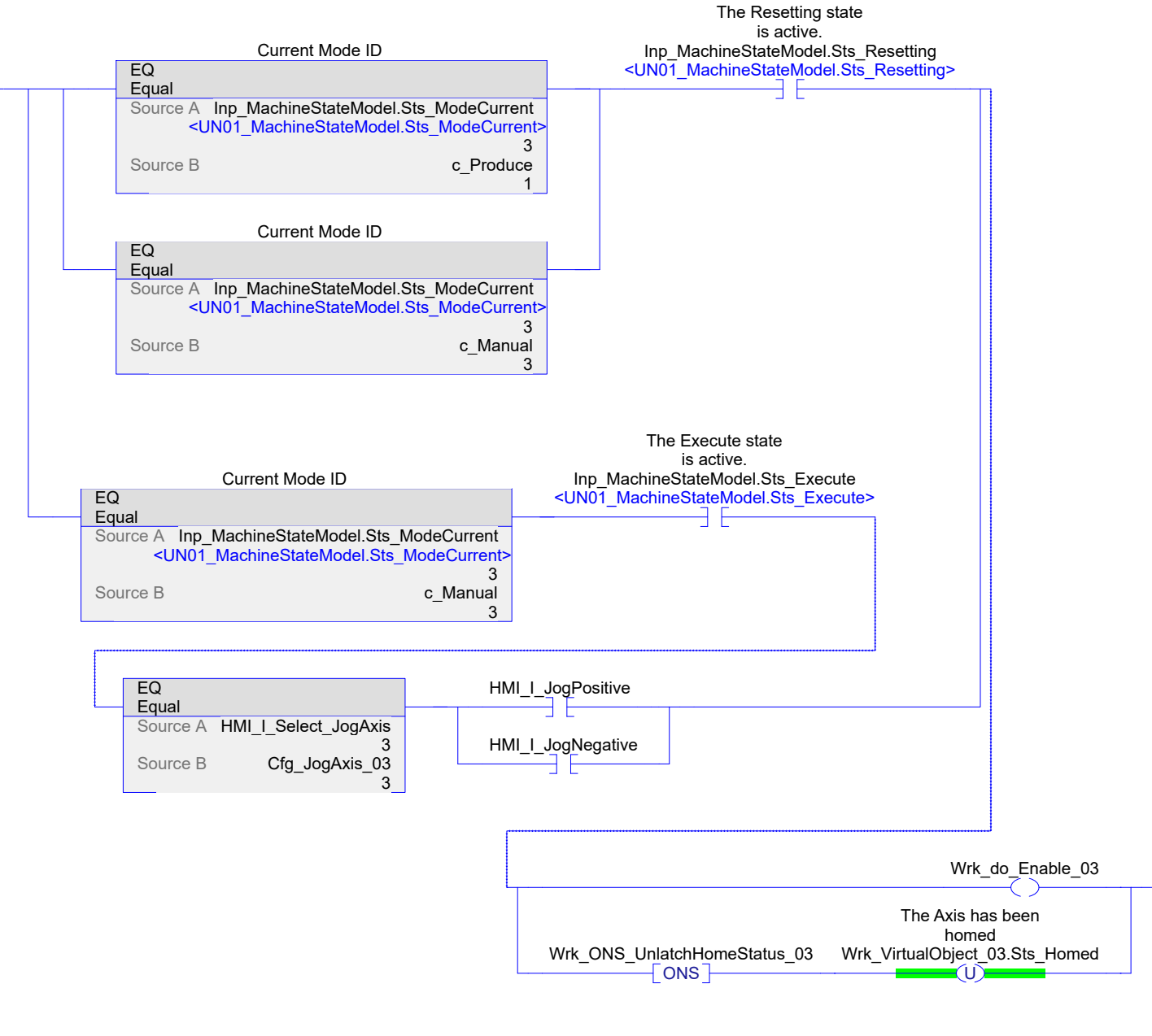
(End)

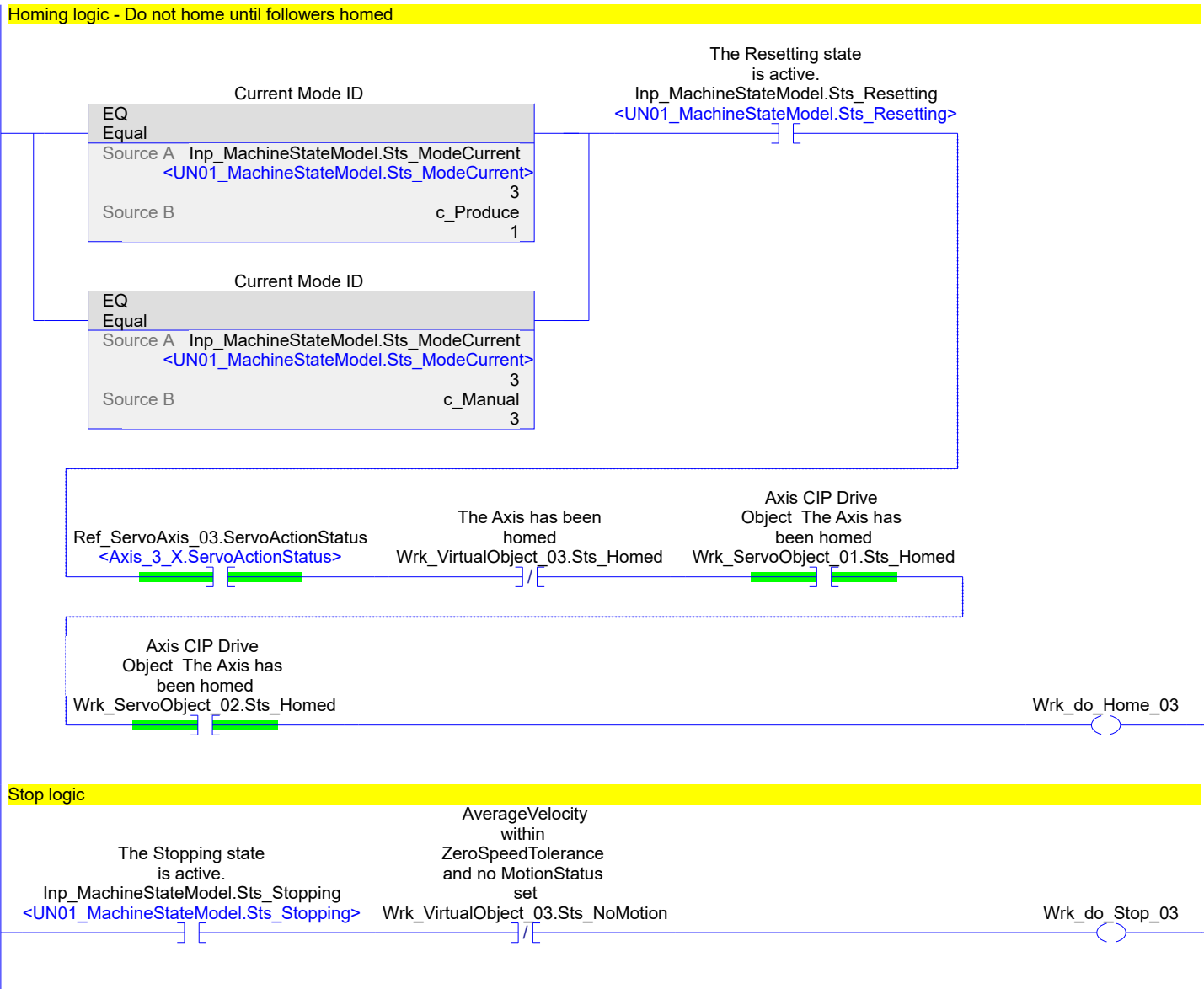
COMPANY: Rockwell Automation  
 FUNCTION: Virtual Axis Object  
 AUTHOR: Rockwell Automation / Kelvin Erickson  
 DATE CREATED: July 2017

Version Comments: Deleted rung 1 in original CM02\_ServoAxisObject getting motion status from master axis  
 Moved rungs dealing with command inputs to Axis\_ObjectCD AOI from PP example CM00\_Procedure into here.  
 Added "\_1" suffix to axis-related tags in preparation to add second axis to EM  
 2021 June 08 Follower axes logic added.

[NOP]

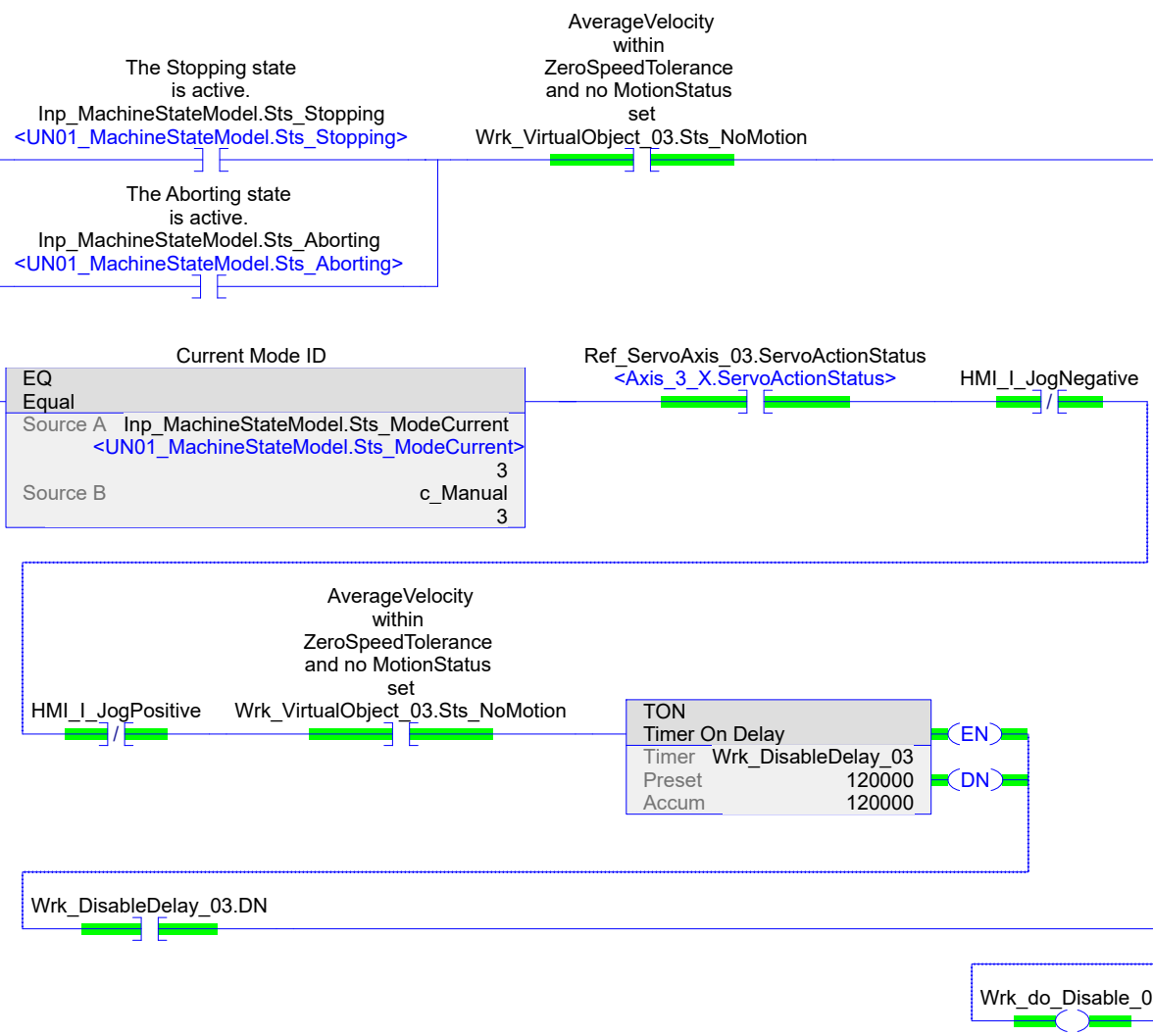
\*\*\*\*\* Added enable when resetting in Manual mode





Disable logic for produce and manual (jogging). Disable if jogging inactive for 2 minutes.

4



5

VIRTUAL AXIS OBJECT

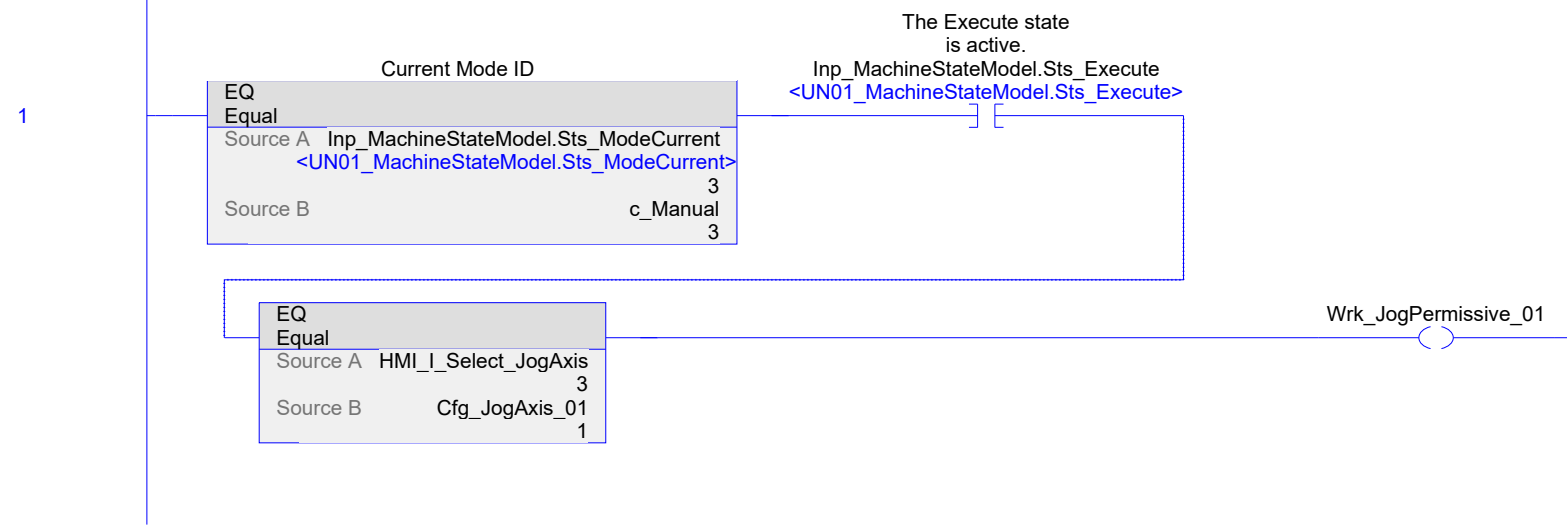
Axis_ObjectAV		
Axis_ObjectAV	Wrk_VirtualObject_03	(Sts_ER)
Ref_Axis_AV	Ref_ServoAxis_03	(Sts_EnableDone)
Inp_MotionGroup	Motion_Group	(Sts_DisableDone)
Cmd_Enable	Wrk_do_Enable_03	(Sts_FaultResetDone)
Cmd_Disable	Wrk_do_Disable_03	(Sts_HomeDone)
Cmd_FaultReset	Inp_MachineStateModel.Sts_Clearing	(Sts_AbortDone)
Cmd_Home	Wrk_do_Home_03	(Sts_StopDone)
Cmd_Abort	Inp_MachineStateModel.Sts_Aborting	(Sts_AxisOk)
Cmd_Stop	Wrk_do_Stop_03	(Sts_NoMotion)
		(Sts_Homed)

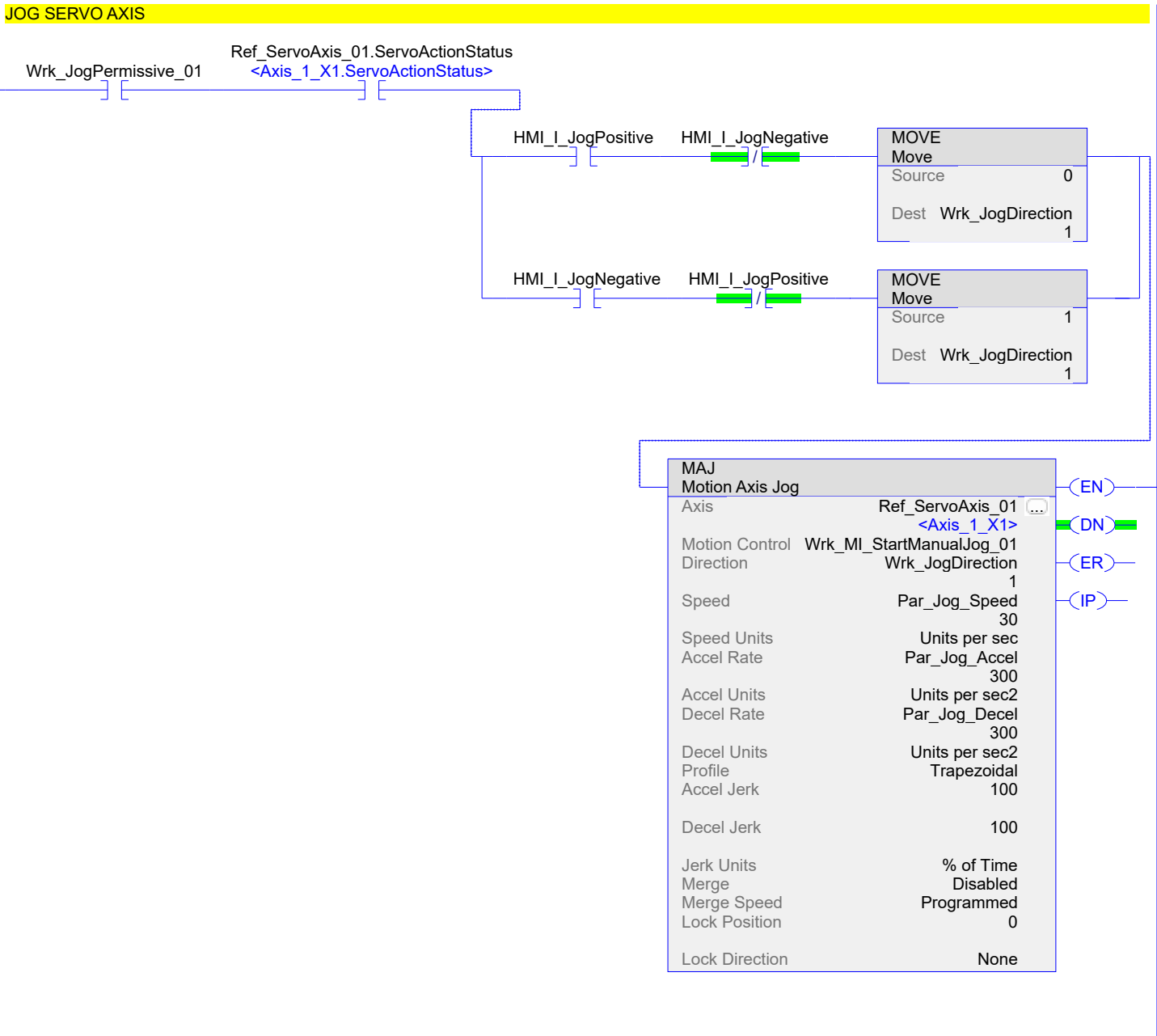
(End)

////////////////////////////////////  
COMPANY: Rockwell Automation  
FUNCTION: Servo Axis Jogging  
AUTHOR: Rockwell Automation  
DATE CREATED: March 2009  
  
Version Comments:  
////////////////////////////////////

0 [NOP]

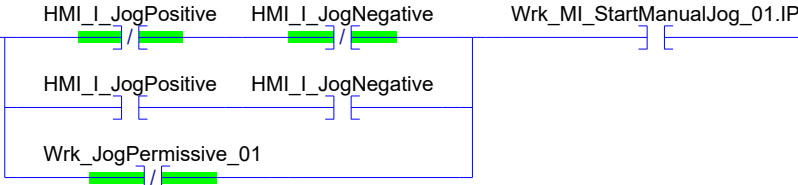
RELEASE JOG FUNCTION Axis number selected via HMI





**STOP SERVO AXIS**

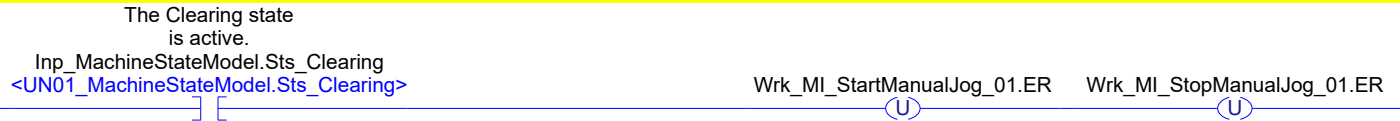
3



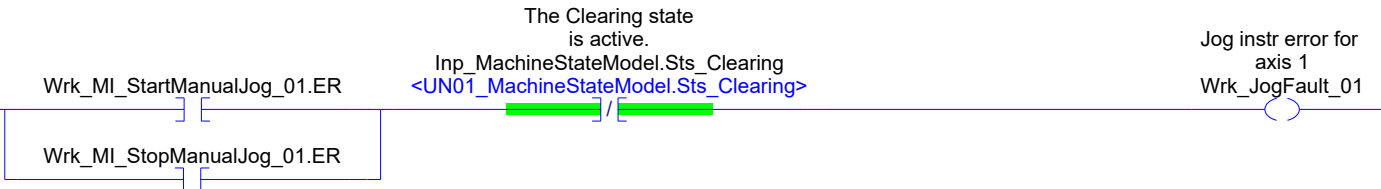
<b>MAS</b>		(EN)
<b>Motion Axis Stop</b>		
Axis	Ref_ServoAxis_01 <Axis_1_X1>	(DN)
Motion Control	Wrk_MI_StopManualJog_01	(ER)
Stop Type	All	
Change Decel	Yes	
Decel Rate	Par_Jog_Decel	(IP)
	300	
Decel Units	Units per sec2	(PC)
Change Decel Jerk	No	
Decel Jerk	100	
Jerk Units	% of Time	

**FAULT RESET**

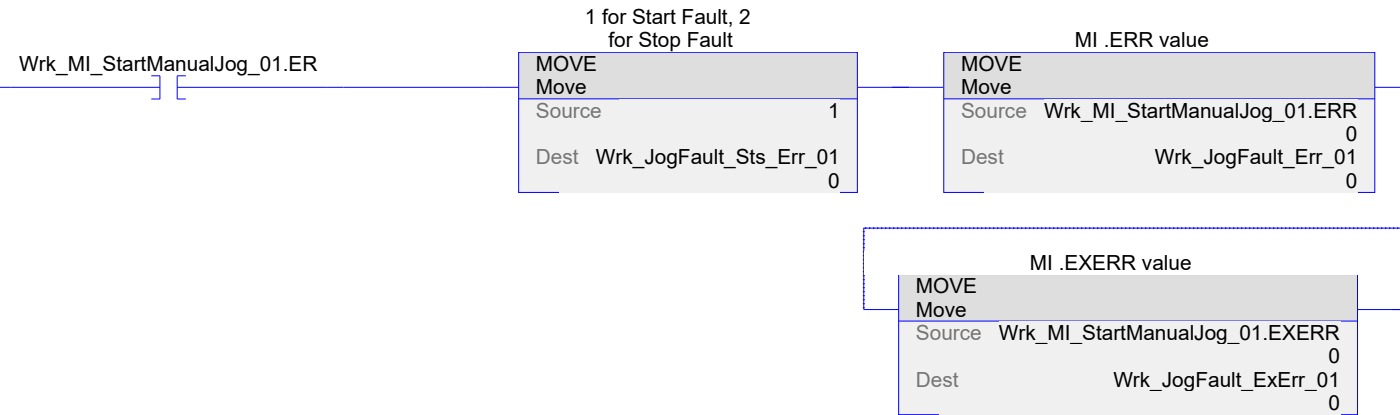
4

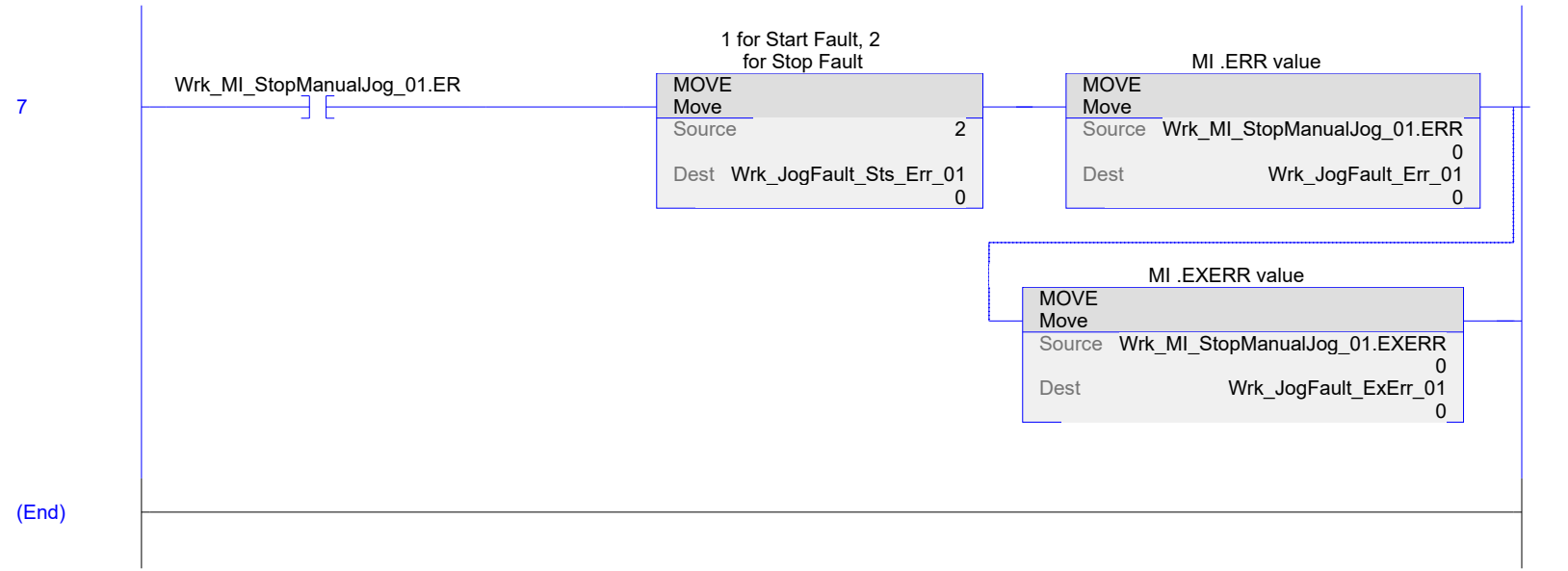


5



6

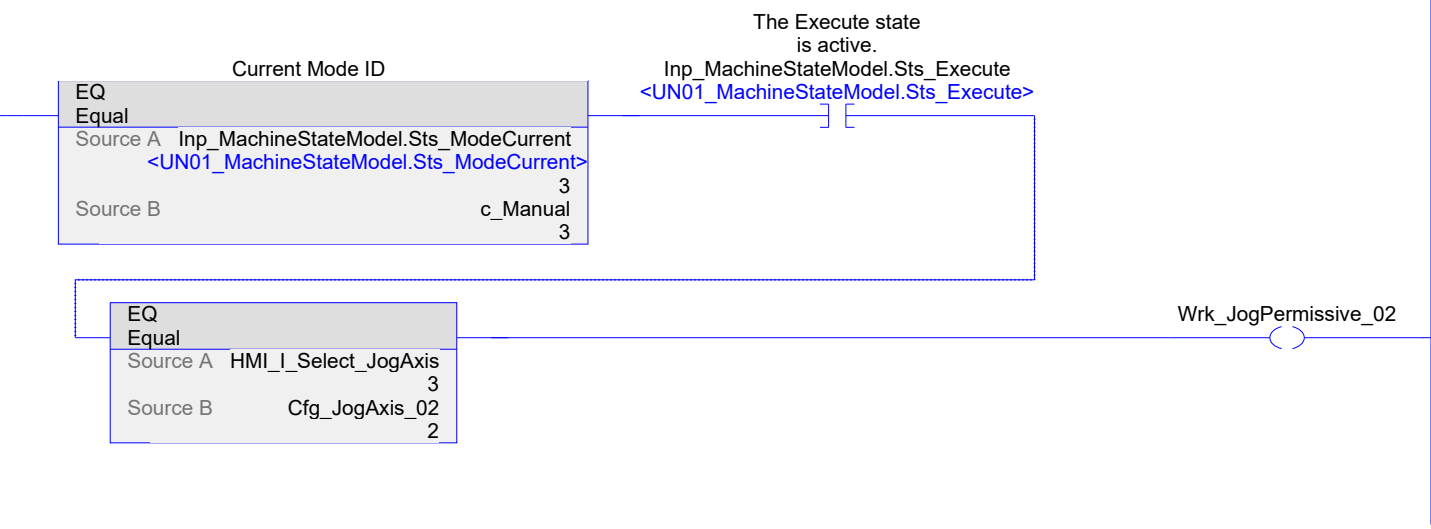




////////////////////////////////////  
COMPANY: Rockwell Automation  
FUNCTION: Servo Axis Jogging  
AUTHOR: Rockwell Automation  
DATE CREATED: March 2009  
  
Version Comments:  
////////////////////////////////////

0 [NOP]

RELEASE JOG FUNCTION Axis number selected via HMI



JOG SERVO AXIS

2

Wrk\_JogPermissive\_02      Ref\_ServoAxis\_02.ServoActionStatus  
 <Axis\_2\_X2.ServoActionStatus>

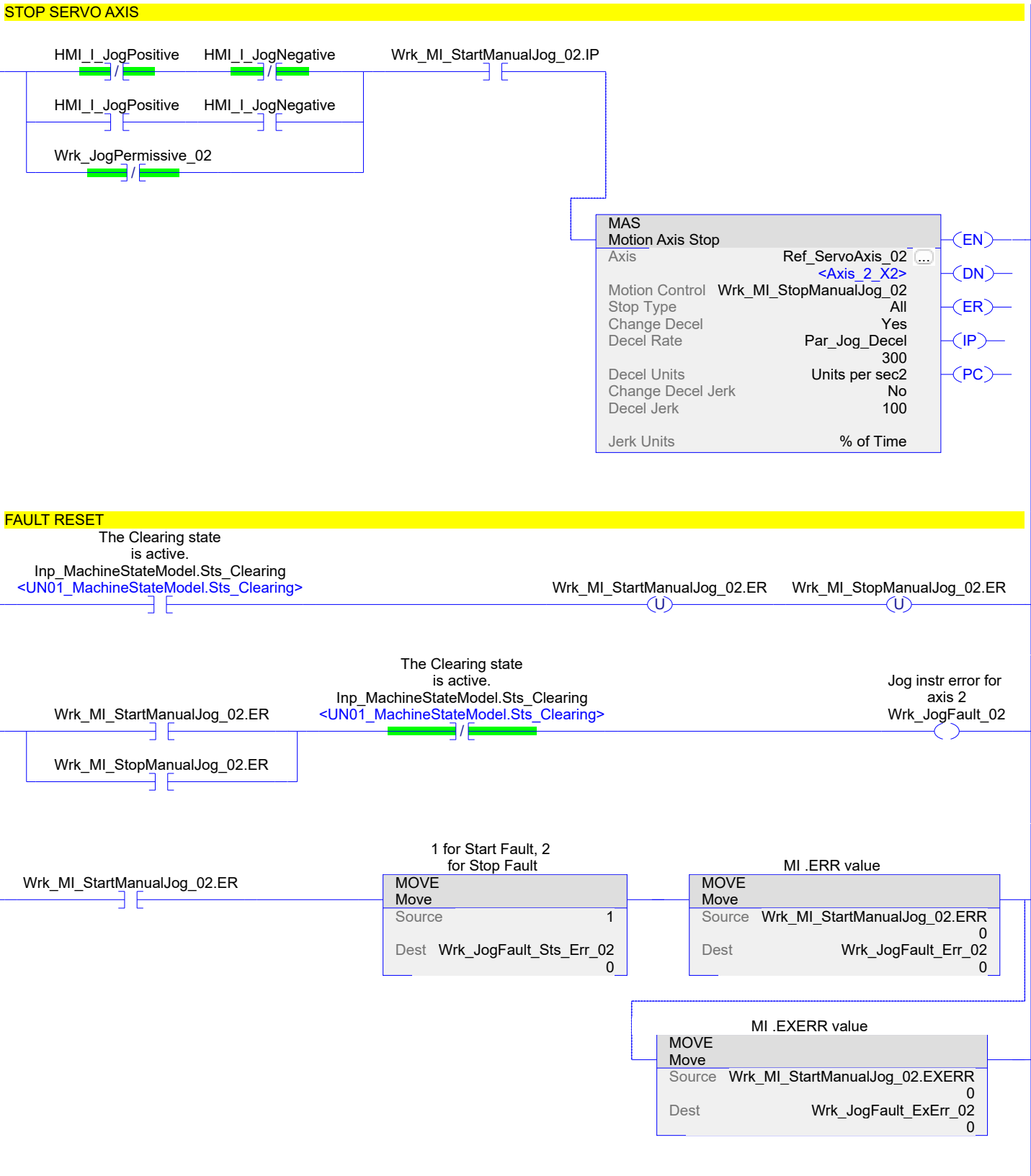
HMI\_I\_JogPositive      HMI\_I\_JogNegative

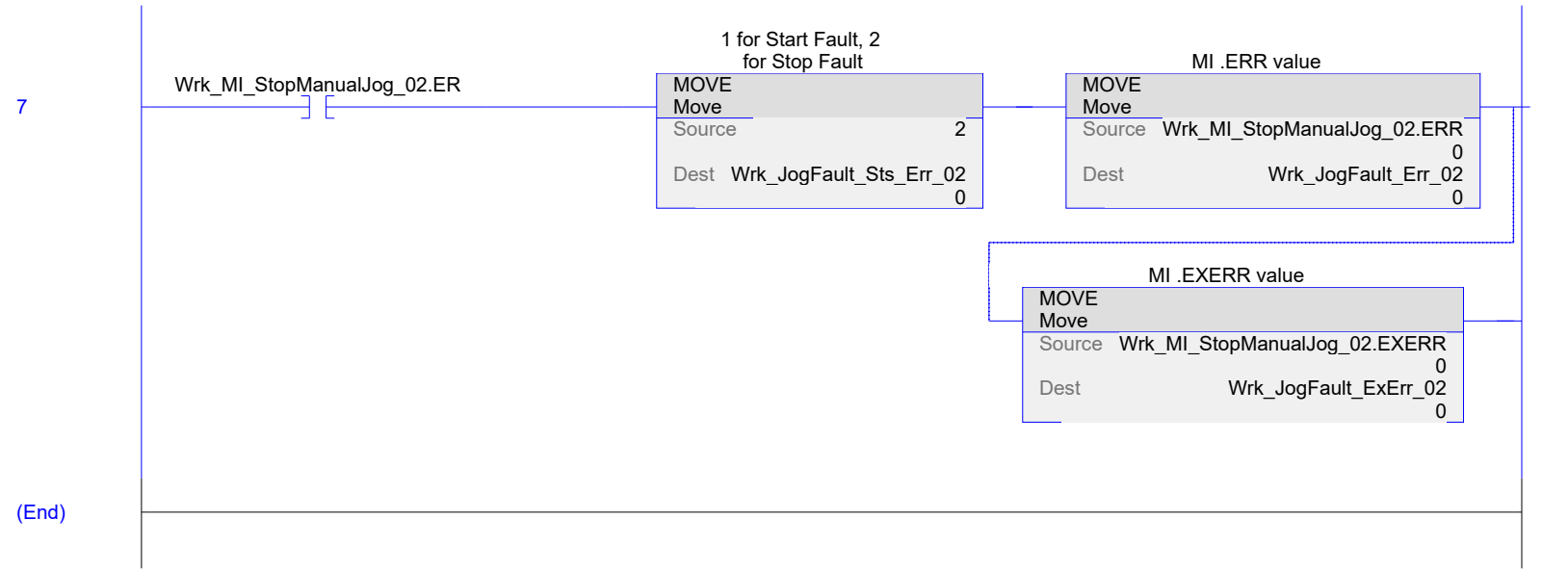
MOVE	
Move	
Source	0
Dest	Wrk_JogDirection
	1

HMI\_I\_JogNegative      HMI\_I\_JogPositive

MOVE	
Move	
Source	1
Dest	Wrk_JogDirection
	1

MAJ	Motion Axis Jog	(EN)
Axis	Ref_ServoAxis_02 <Axis_2_X2>	(DN)
Motion Control	Wrk_MI_StartManualJog_02	(ER)
Direction	Wrk_JogDirection	(IP)
Speed	Par_Jog_Speed	
	30	
Speed Units	Units per sec	
Accel Rate	Par_Jog_Accel	
	300	
Accel Units	Units per sec2	
Decel Rate	Par_Jog_Decel	
	300	
Decel Units	Units per sec2	
Profile	Trapezoidal	
Accel Jerk	100	
Decel Jerk	100	
Jerk Units	% of Time	
Merge	Disabled	
Merge Speed	Programmed	
Lock Position	0	
Lock Direction	None	

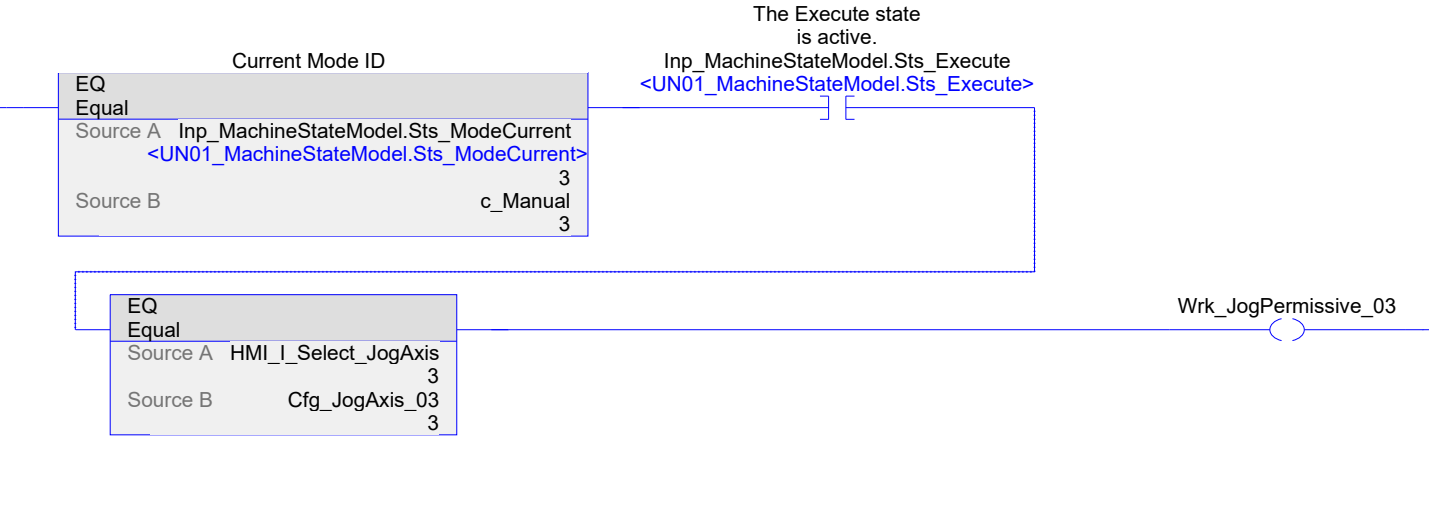




////////////////////////////////////  
COMPANY: Rockwell Automation  
FUNCTION: Servo Axis Jogging  
AUTHOR: Rockwell Automation  
DATE CREATED: March 2009  
  
Version Comments:  
////////////////////////////////////

0 [NOP]

RELEASE JOG FUNCTION Axis number selected via HMI



JOG SERVO AXIS

2

Wrk\_JogPermissive\_03      Ref\_ServoAxis\_03.ServoActionStatus  
 <Axis\_3\_X.ServoActionStatus>

HMI\_I\_JogPositive      HMI\_I\_JogNegative

MOVE	
Move	
Source	0
Dest	Wrk_JogDirection 1

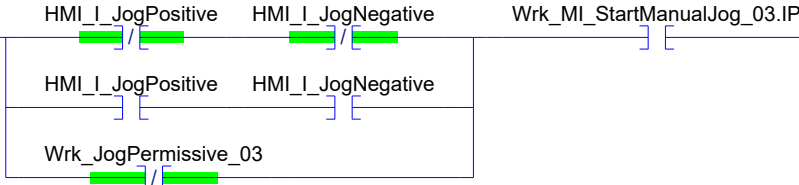
HMI\_I\_JogNegative      HMI\_I\_JogPositive

MOVE	
Move	
Source	1
Dest	Wrk_JogDirection 1

MAJ	Motion Axis Jog	(EN)
Axis	Ref_ServoAxis_03 <Axis_3_X>	(DN)
Motion Control	Wrk_MI_StartManualJog_03	(ER)
Direction	Wrk_JogDirection 1	(IP)
Speed	Par_Jog_Speed 30	
Speed Units	Units per sec	
Accel Rate	Par_Jog_Accel 300	
Accel Units	Units per sec2	
Decel Rate	Par_Jog_Decel 300	
Decel Units	Units per sec2	
Profile	Trapezoidal	
Accel Jerk	100	
Decel Jerk	100	
Jerk Units	% of Time	
Merge	Disabled	
Merge Speed	Programmed	
Lock Position	0	
Lock Direction	None	

**STOP SERVO AXIS**

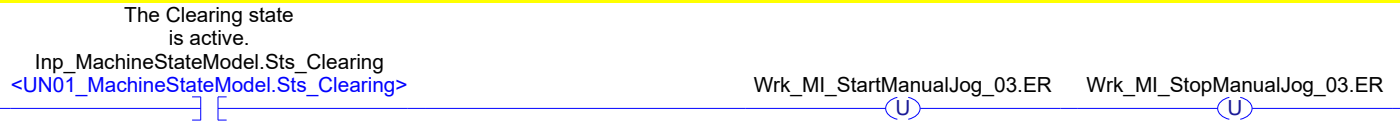
3



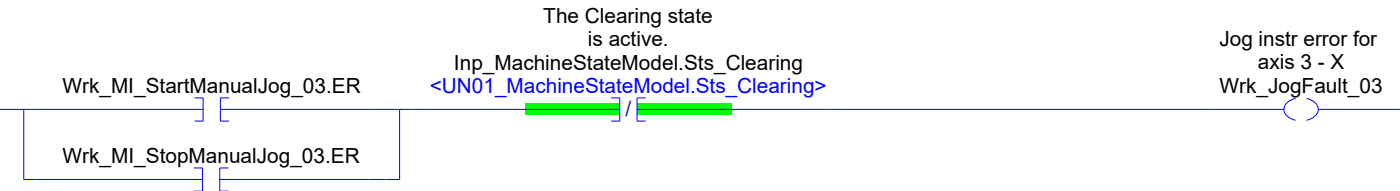
<b>MAS</b>		(EN)
<b>Motion Axis Stop</b>		
Axis	Ref_ServoAxis_03 <Axis_3_X>	(DN)
Motion Control	Wrk_MI_StopManualJog_03	(ER)
Stop Type	All	
Change Decel	Yes	(IP)
Decel Rate	Par_Jog_Decel 300	
Decel Units	Units per sec2	(PC)
Change Decel Jerk	No	
Decel Jerk	100	
Jerk Units	% of Time	

**FAULT RESET**

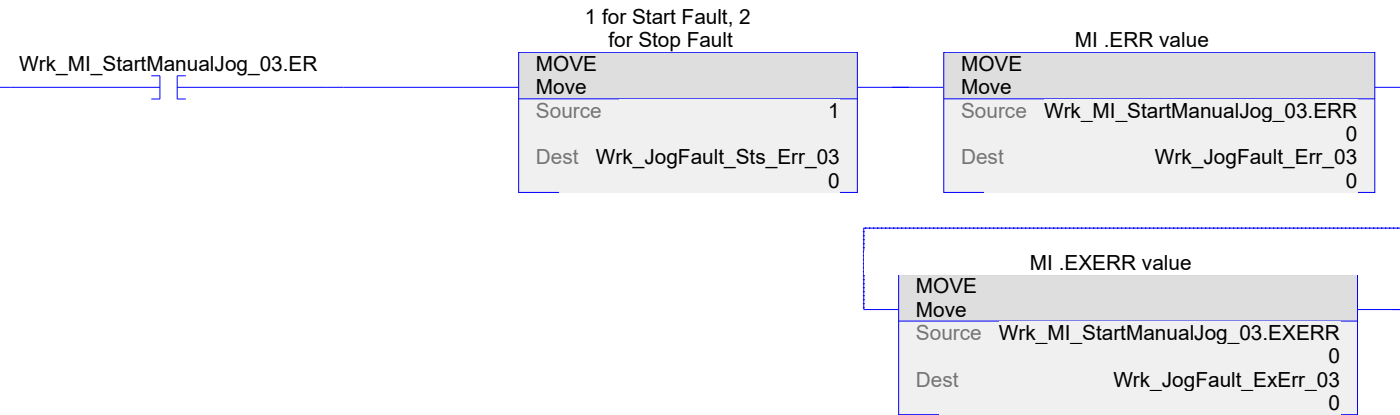
4

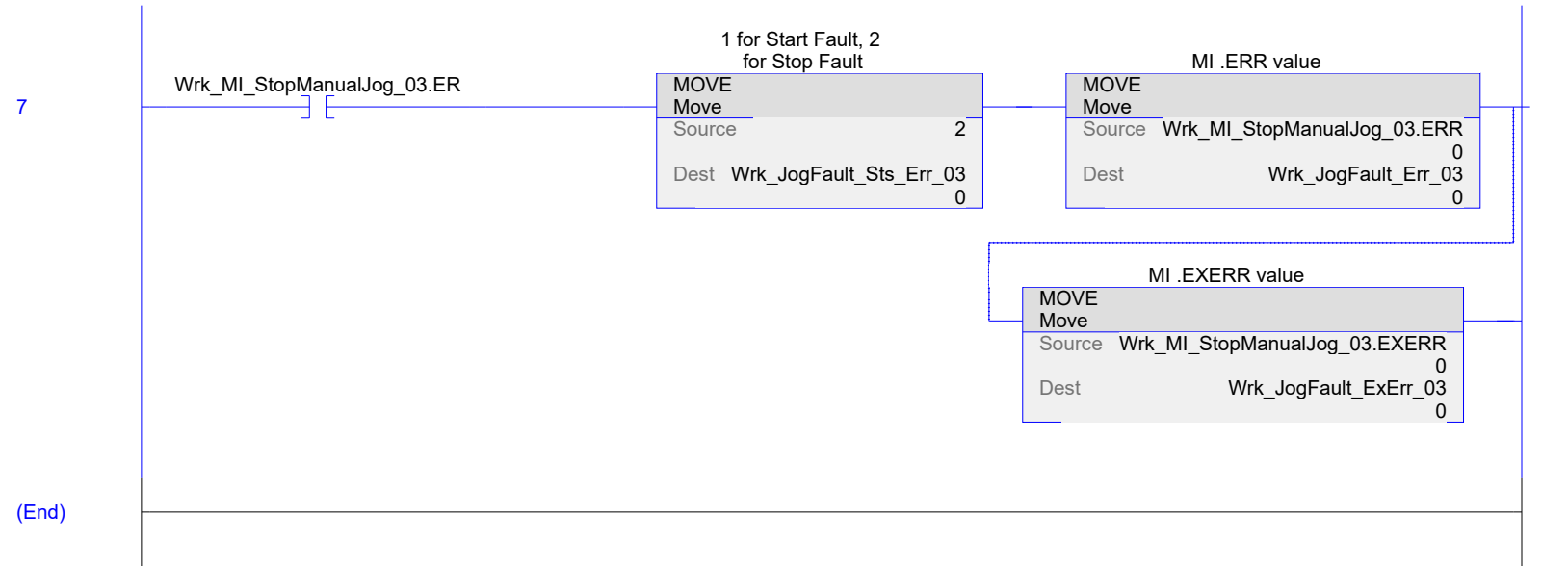


5

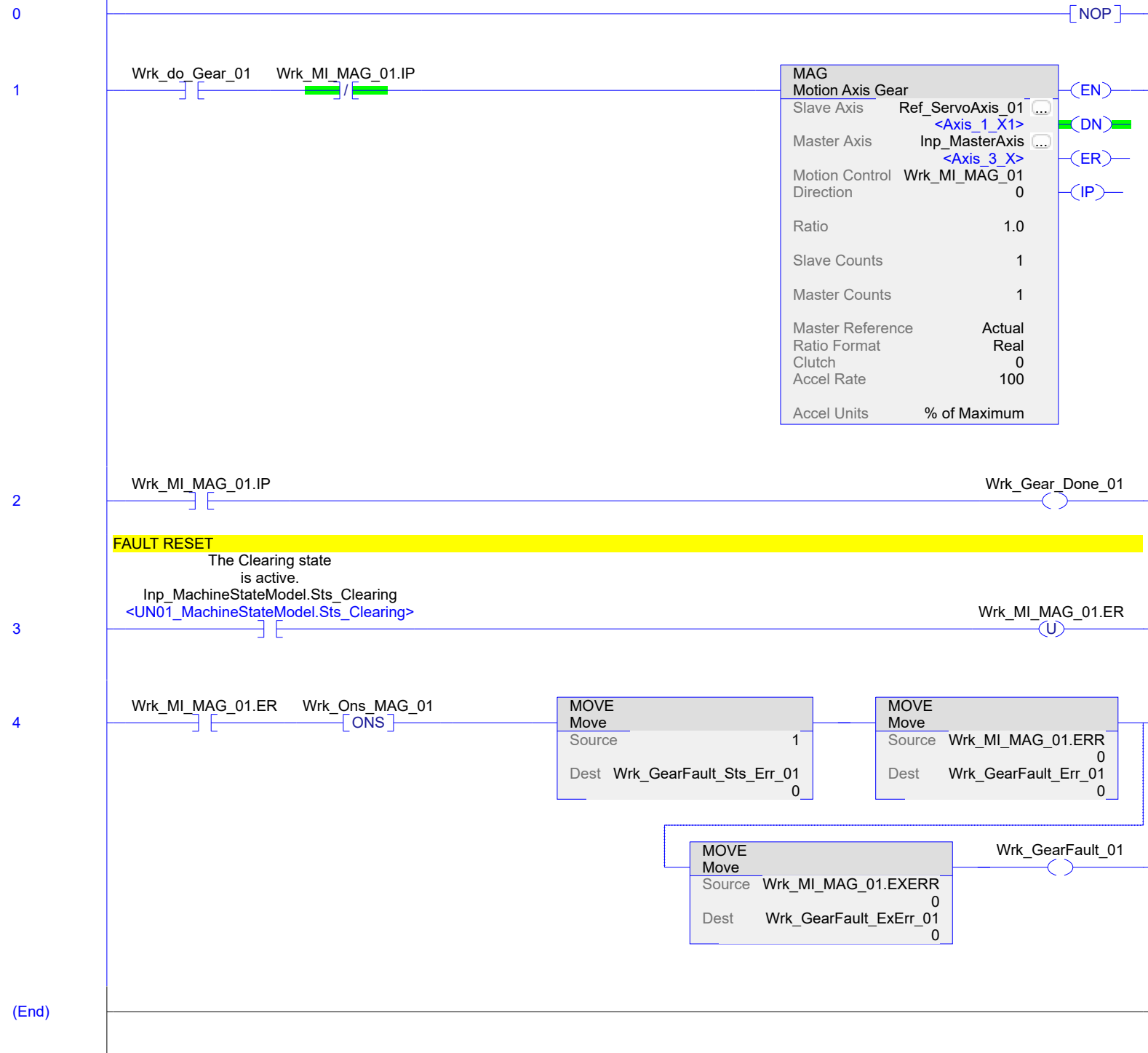


6



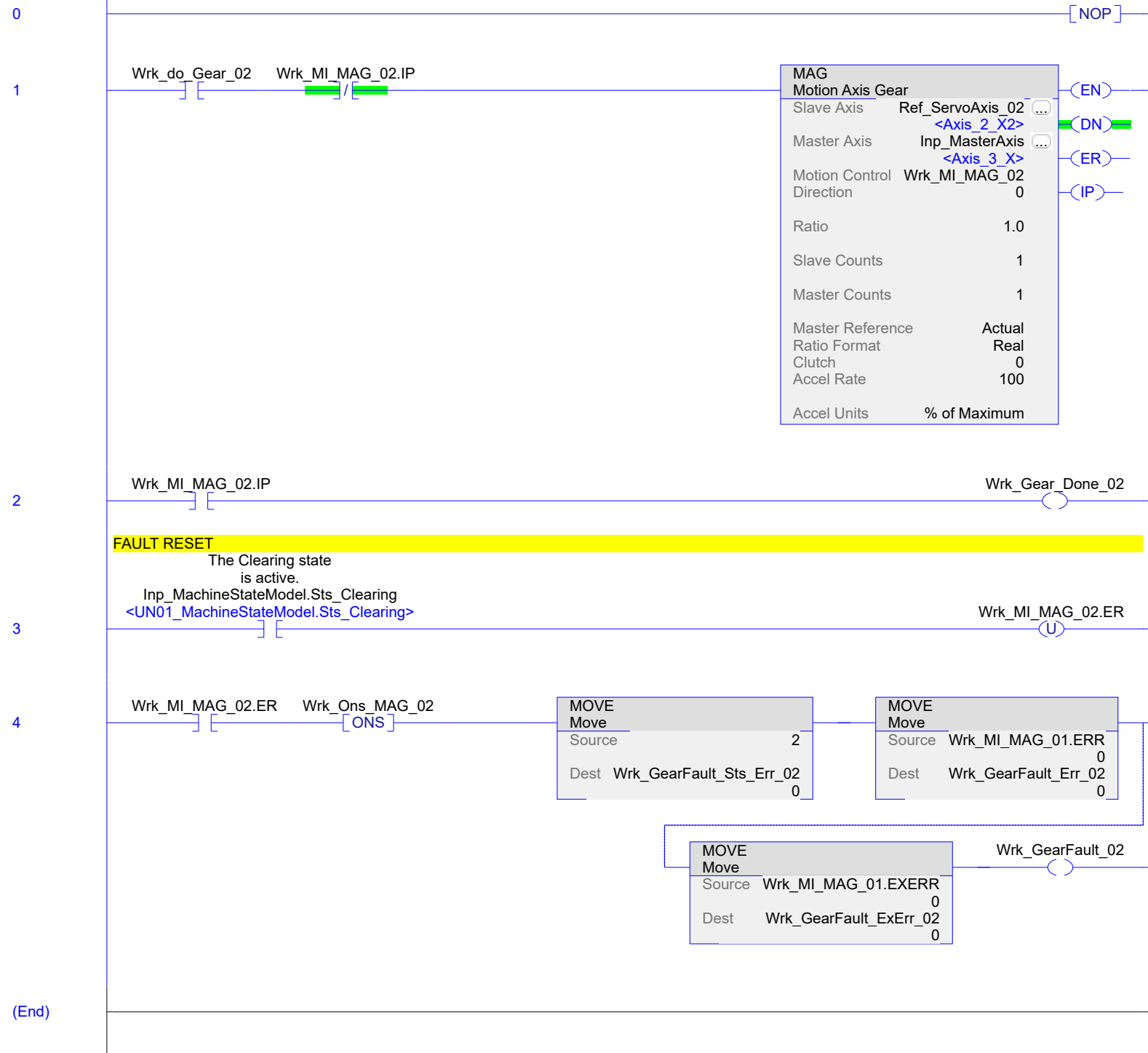


////////////////////////////////////  
 COMPANY: Rockwell Automation  
 FUNCTION: Gearing  
 AUTHOR: Rockwell Automation  
 DATE CREATED: March 2011  
 Version Comments:  
 //////////////////////////////////////



(End)

////////////////////////////////////  
 COMPANY: Rockwell Automation  
 FUNCTION: Gearing  
 AUTHOR: Rockwell Automation  
 DATE CREATED: March 2011  
 Version Comments:  
 //////////////////////////////////////



(End)

```

  //////////////////////////////////////
  COMPANY:      Rockwell Automation
  FUNCTION:     Virtual Follower Axis - Equipment Module
  AUTHOR:      Rockwell Automation / Kelvin Erickson
  DATE CREATED: July 2017

  Version Comments: Started with EM_Follower01 program in Power Programming example, PPBasicV4_2.ACD

  No gearing CM
  //////////////////////////////////////
  
```

0 [NOP]

INITIALIZE

Initialize Data

Performs initialization of any local parameters of this Equipment Module and contained Control Modules that require it

S:FS

JSR  
 Jump To Subroutine  
 Routine Name SR20\_Initialize

Set EM number to 1

EM Number

MOVE
Move
Source 1
Dest Cfg_EM_Number 1

THIS EQUIPMENT MODULE IS SELECTED AND ACTIVE

This Tag is used to enable states for each Equipment Module  
 EM\_Selected.[Cfg\_EM\_Number]

Set axis numbers for jogging

HMI jog axis number for axis 1 - X1

HMI jog axis number for axis 2 - X2

HMI jog axis number for axis 3 - X

MOVE
Move
Source 1
Dest Cfg_JogAxis_01 1

MOVE
Move
Source 2
Dest Cfg_JogAxis_02 2

MOVE
Move
Source 3
Dest Cfg_JogAxis_03 3

5 JSR  
 Jump To Subroutine  
 Routine Name CM00\_Procedure

SERVO AXIS X1 AND IT'S LOGICAL FUNCTIONS

This Control Module performs the state control for the slave axis; including Enable, Disable, Reset, Absolute Home, Stop, and Abort

JSR  
Jump To Subroutine  
Routine Name CM02\_01\_ServoAxisObject\_X1

Control Module Manual Jog Control

This Control Module jogs the servo axis when the Unit is in Manual mode. This provides independent control of the servo axis.

JSR  
Jump To Subroutine  
Routine Name CM03\_01\_ServoAxisJog\_X1

This Control Module defines the Gear follower profile, and initiates the synchronization of this slave to the master

JSR  
Jump To Subroutine  
Routine Name CM04\_01\_ServoAxisGear\_X1

SERVO AXIS X2 AND IT'S LOGICAL FUNCTIONS

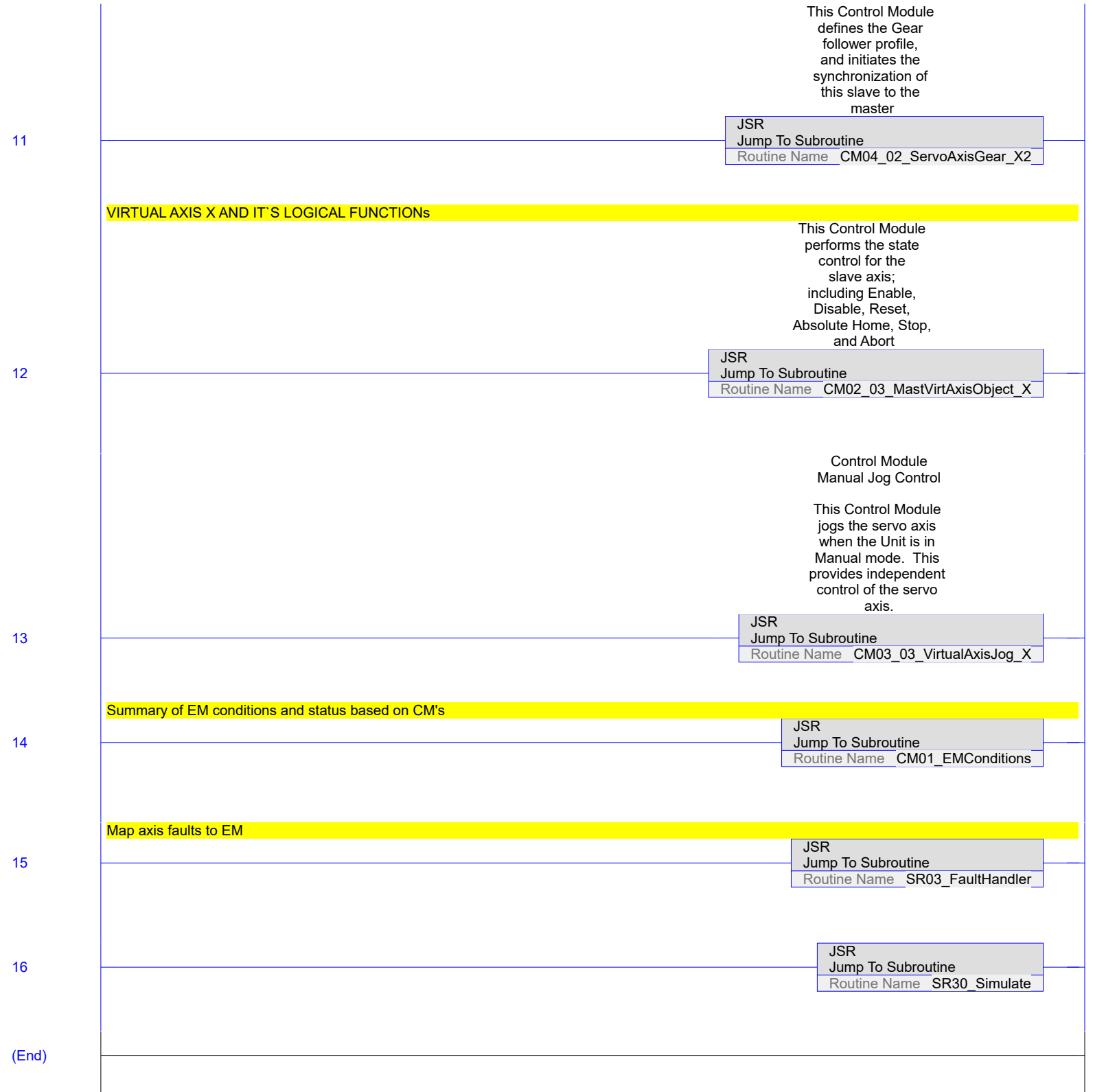
This Control Module performs the state control for the slave axis; including Enable, Disable, Reset, Absolute Home, Stop, and Abort

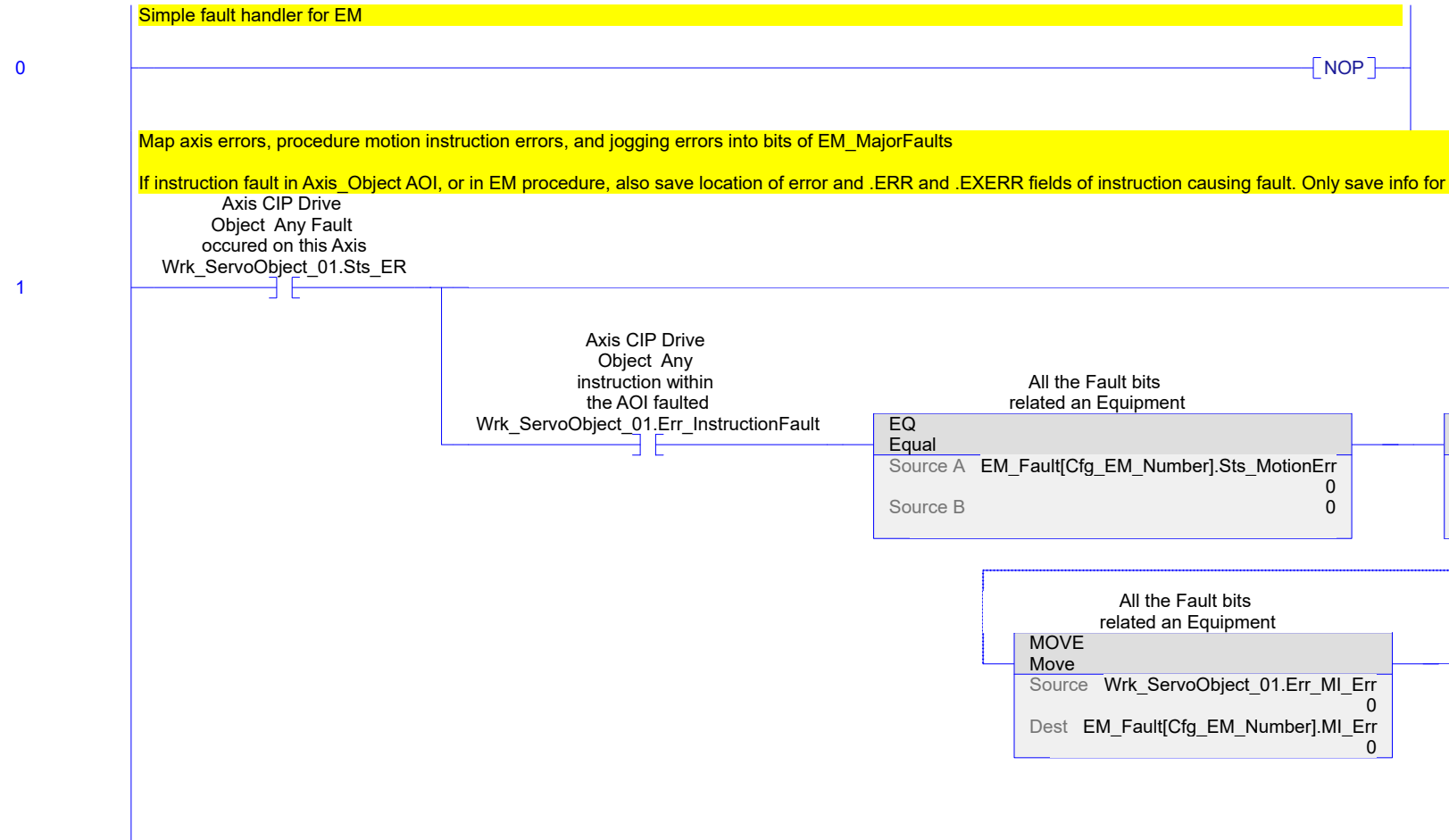
JSR  
Jump To Subroutine  
Routine Name CM02\_02\_ServoAxisObject\_X2

Control Module Manual Jog Control

This Control Module jogs the servo axis when the Unit is in Manual mode. This provides independent control of the servo axis.

JSR  
Jump To Subroutine  
Routine Name CM03\_02\_ServoAxisJog\_X2





st fault after resetting.

All the Fault bits  
related an Equipment  
EM\_Fault[Cfg\_EM\_Number].EM\_MajorFaults.0



All the Fault bits  
related an Equipment

MOVE  
Move  
Source Wrk\_ServoObject\_01.Sts\_Err  
0  
Dest EM\_Fault[Cfg\_EM\_Number].Sts\_MotionErr  
0

All the Fault bits  
related an Equipment

MOVE  
Move  
Source Wrk\_ServoObject\_01.Err\_MI\_ExErr  
0  
Dest EM\_Fault[Cfg\_EM\_Number].MI\_Exerr  
0

Axis CIP Drive  
Object Any Fault  
occured on this Axis  
Wrk\_ServoObject\_02.Sts\_ER

Axis CIP Drive  
Object Any  
instruction within  
the AOI faulted  
Wrk\_ServoObject\_02.Err\_InstructionFault

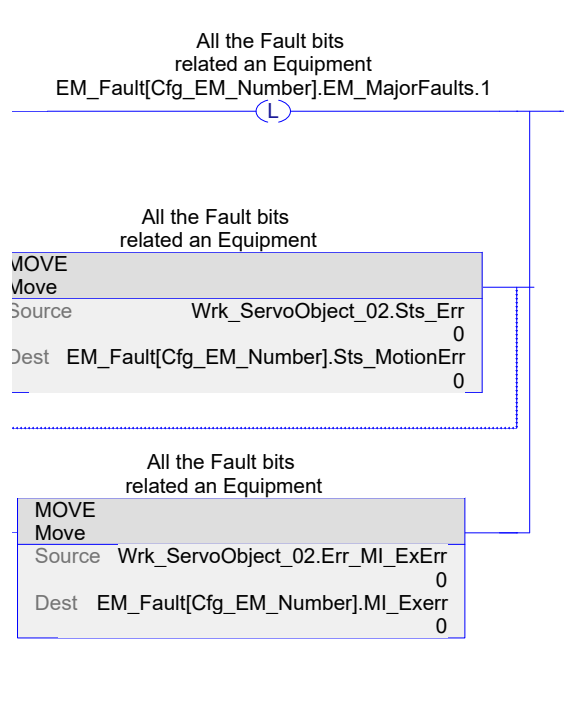
All the Fault bits  
related an Equipment

EQ  
Equal  
Source A EM\_Fault[Cfg\_EM\_Number].Sts\_MotionErr  
0  
Source B 0

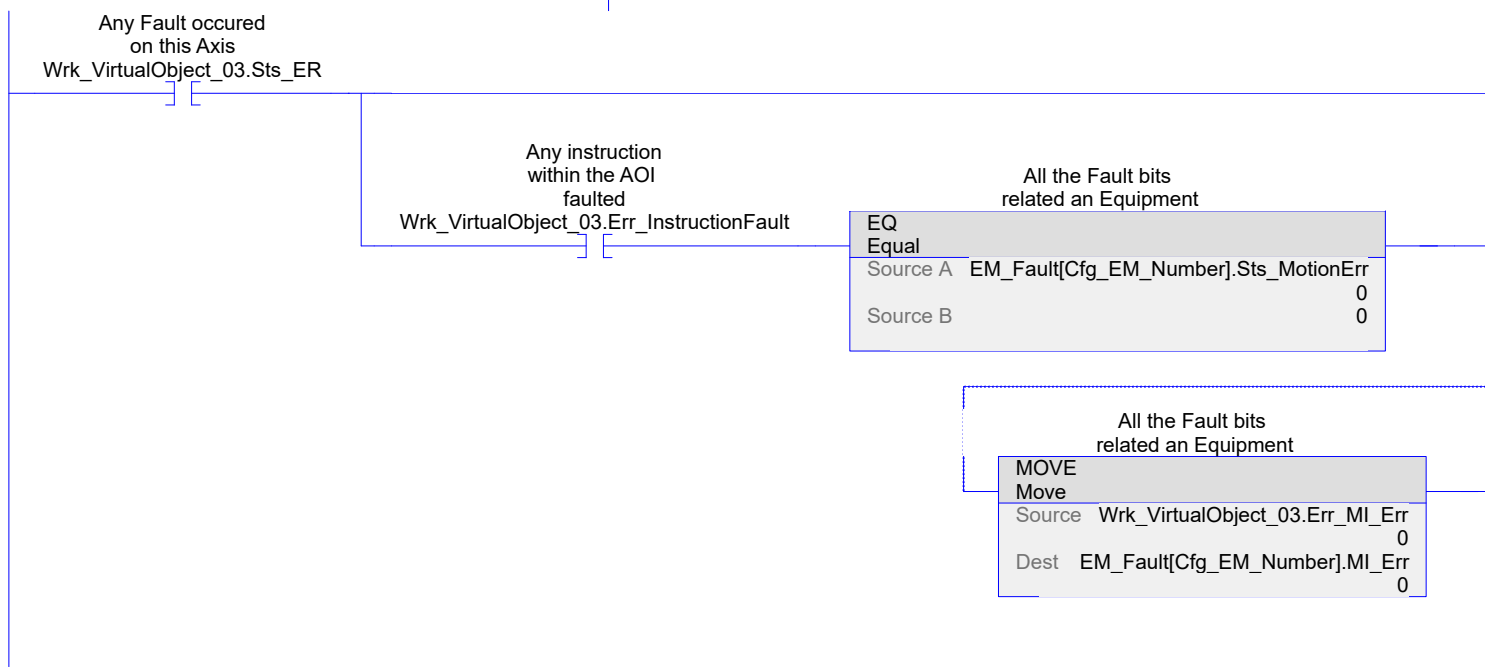
All the Fault bits  
related an Equipment

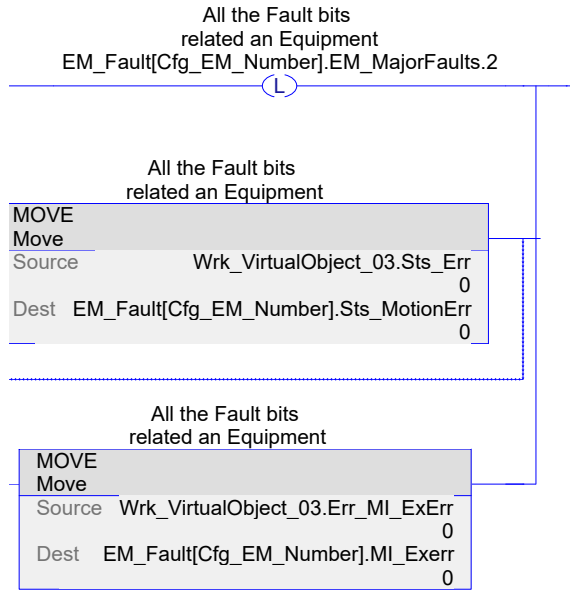
MOVE  
Move  
Source Wrk\_ServoObject\_02.Err\_MI\_Err  
0  
Dest EM\_Fault[Cfg\_EM\_Number].MI\_Err  
0

2



3



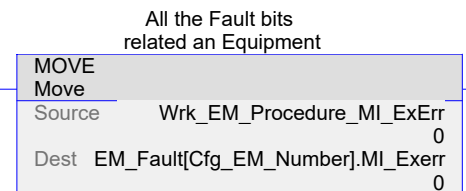
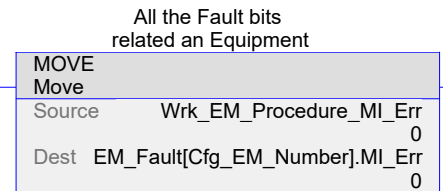
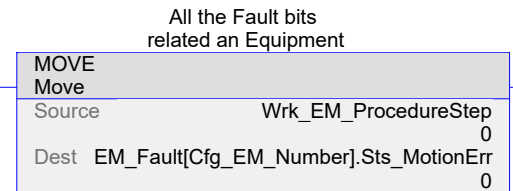
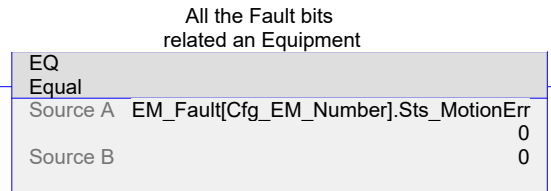


4

EM Sequence move  
 instr error  
 Wrk\_EM\_ProcedureFault

All the Fault bits related an Equipment  
 EM\_Fault[Cfg\_EM\_Number].EM\_MajorFaults.10

(L)



5

Jog instr error for  
axis 1  
Wrk\_JogFault\_01

All the Fault bits  
related an Equipment  
EM\_Fault[Cfg\_EM\_Number].EM\_MajorFaults.11



All the Fault bits  
related an Equipment

<b>EQ</b> Equal	
Source A	EM_Fault[Cfg_EM_Number].Sts_MotionErr 0
Source B	0

All the Fault bits  
related an Equipment

<b>MOVE</b> Move	
Source	Wrk_JogFault_Sts_Err_01 0
Dest	EM_Fault[Cfg_EM_Number].Sts_MotionErr 0

All the Fault bits  
related an Equipment

<b>MOVE</b> Move	
Source	Wrk_JogFault_Err_01 0
Dest	EM_Fault[Cfg_EM_Number].MI_Err 0

All the Fault bits  
related an Equipment

<b>MOVE</b> Move	
Source	Wrk_JogFault_ExErr_01 0
Dest	EM_Fault[Cfg_EM_Number].MI_Exerr 0

6

Jog instr error for  
axis 2  
Wrk\_JogFault\_02

All the Fault bits  
related an Equipment  
EM\_Fault[Cfg\_EM\_Number].EM\_MajorFaults.5



All the Fault bits  
related an Equipment

<b>EQ</b> Equal	
Source A	EM_Fault[Cfg_EM_Number].Sts_MotionErr 0
Source B	0

All the Fault bits  
related an Equipment

<b>MOVE</b> Move	
Source	Wrk_JogFault_Sts_Err_02 0
Dest	EM_Fault[Cfg_EM_Number].Sts_MotionErr 0

All the Fault bits  
related an Equipment

<b>MOVE</b> Move	
Source	Wrk_JogFault_Err_02 0
Dest	EM_Fault[Cfg_EM_Number].MI_Err 0

All the Fault bits  
related an Equipment

<b>MOVE</b> Move	
Source	Wrk_JogFault_ExErr_02 0
Dest	EM_Fault[Cfg_EM_Number].MI_Exerr 0

7

Jog instr error for  
axis 3 - X  
Wrk\_JogFault\_03

All the Fault bits  
related an Equipment  
EM\_Fault[Cfg\_EM\_Number].EM\_MajorFaults.5



All the Fault bits  
related an Equipment

<b>EQ</b> Equal	
Source A	EM_Fault[Cfg_EM_Number].Sts_MotionErr 0
Source B	0

All the Fault bits  
related an Equipment

<b>MOVE</b> Move	
Source	Wrk_JogFault_Sts_Err_03 0
Dest	EM_Fault[Cfg_EM_Number].Sts_MotionErr 0

All the Fault bits  
related an Equipment

<b>MOVE</b> Move	
Source	Wrk_JogFault_Err_03 0
Dest	EM_Fault[Cfg_EM_Number].MI_Err 0

All the Fault bits  
related an Equipment

<b>MOVE</b> Move	
Source	Wrk_JogFault_ExErr_03 0
Dest	EM_Fault[Cfg_EM_Number].MI_Exerr 0

Gearing errors

Wrk\_GearFault\_01

All the Fault bits  
related an Equipment  
EM\_Fault[Cfg\_EM\_Number].EM\_MajorFaults.6

All the Fault bits  
related an Equipment

EQ Equal	
Source A	EM_Fault[Cfg_EM_Number].Sts_MotionErr 0
Source B	0

All the Fault bits  
related an Equipment

MOVE Move	
Source	Wrk_GearFault_Sts_Err_01 0
Dest	EM_Fault[Cfg_EM_Number].Sts_MotionErr 0

All the Fault bits  
related an Equipment

MOVE Move	
Source	Wrk_GearFault_Err_01 0
Dest	EM_Fault[Cfg_EM_Number].MI_Err 0

All the Fault bits  
related an Equipment

MOVE Move	
Source	Wrk_GearFault_ExErr_01 0
Dest	EM_Fault[Cfg_EM_Number].MI_Exerr 0

9

Wrk\_GearFault\_02

All the Fault bits related an Equipment  
 EM\_Fault[Cfg\_EM\_Number].EM\_MajorFaults.6

All the Fault bits related an Equipment

EQ	Equal
Source A	EM_Fault[Cfg_EM_Number].Sts_MotionErr
	0
Source B	0

All the Fault bits related an Equipment

MOVE	Move
Source	Wrk_GearFault_Sts_Err_02
	0
Dest	EM_Fault[Cfg_EM_Number].Sts_MotionErr
	0

All the Fault bits related an Equipment

MOVE	Move
Source	Wrk_GearFault_Err_02
	0
Dest	EM_Fault[Cfg_EM_Number].MI_Err
	0

All the Fault bits related an Equipment

MOVE	Move
Source	Wrk_GearFault_ExErr_02
	0
Dest	EM_Fault[Cfg_EM_Number].MI_Exerr
	0

\*\*\*\*\* Moved from CM04\_ServoAxisGear  
 Watchdog for resetting - Create an error if timeout occurs

10

The Resetting state is active.  
 Inp\_MachineStateModel.Sts\_Resetting  
 <UN01\_MachineStateModel.Sts\_Resetting> EM\_Resetting\_Done.[Cfg\_EM\_Number]

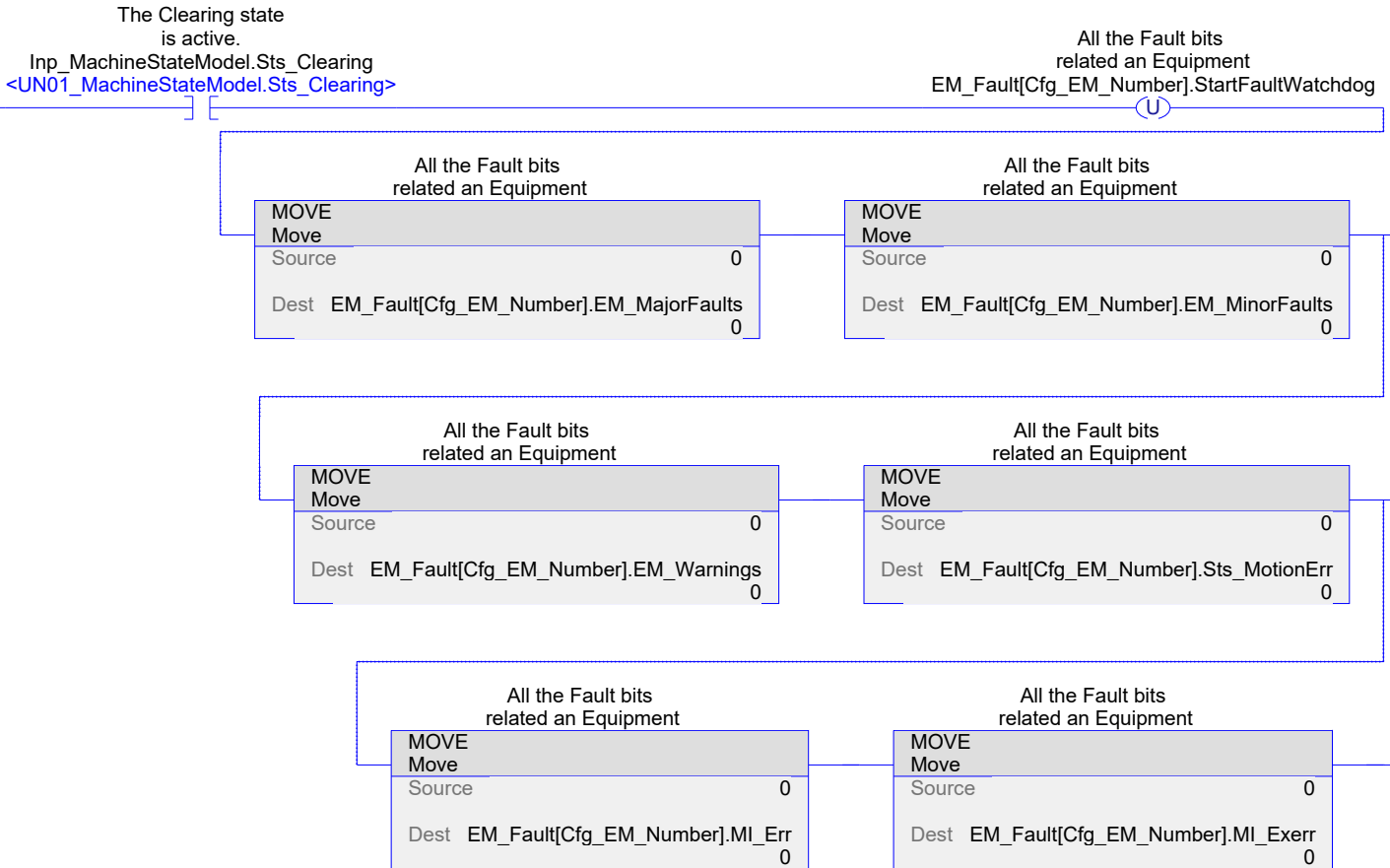
All the Fault bits related an Equipment

TON	Timer On Delay
Timer	EM_Fault[Cfg_EM_Number].WatchdogPrepareExecution
Preset	60000
Accum	0

(EN)  
(DN)

\*\*\*\*\* Moved from CM04\_ServoAxisGear  
 \*\*\*\*\* Added clear of Sts\_Err  
 Clearing resets watchdog faults and other faults and warnings and clears instruction fault error details

11



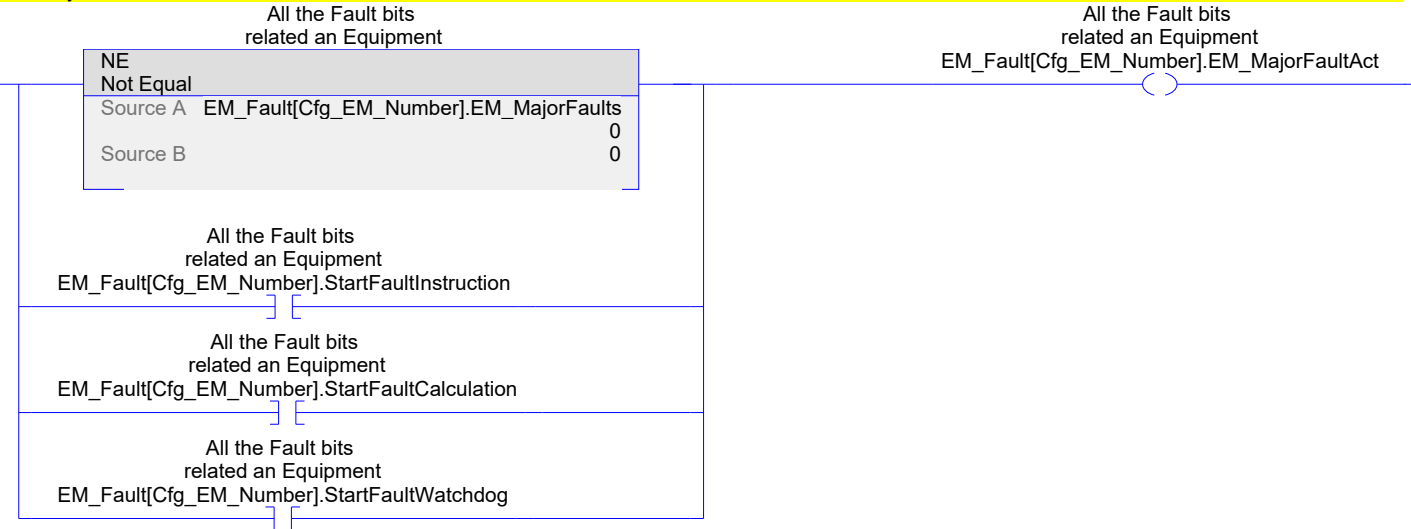
\*\*\*\*\* Moved from CM04\_ServoAxisGear  
 Watchdog fault bit

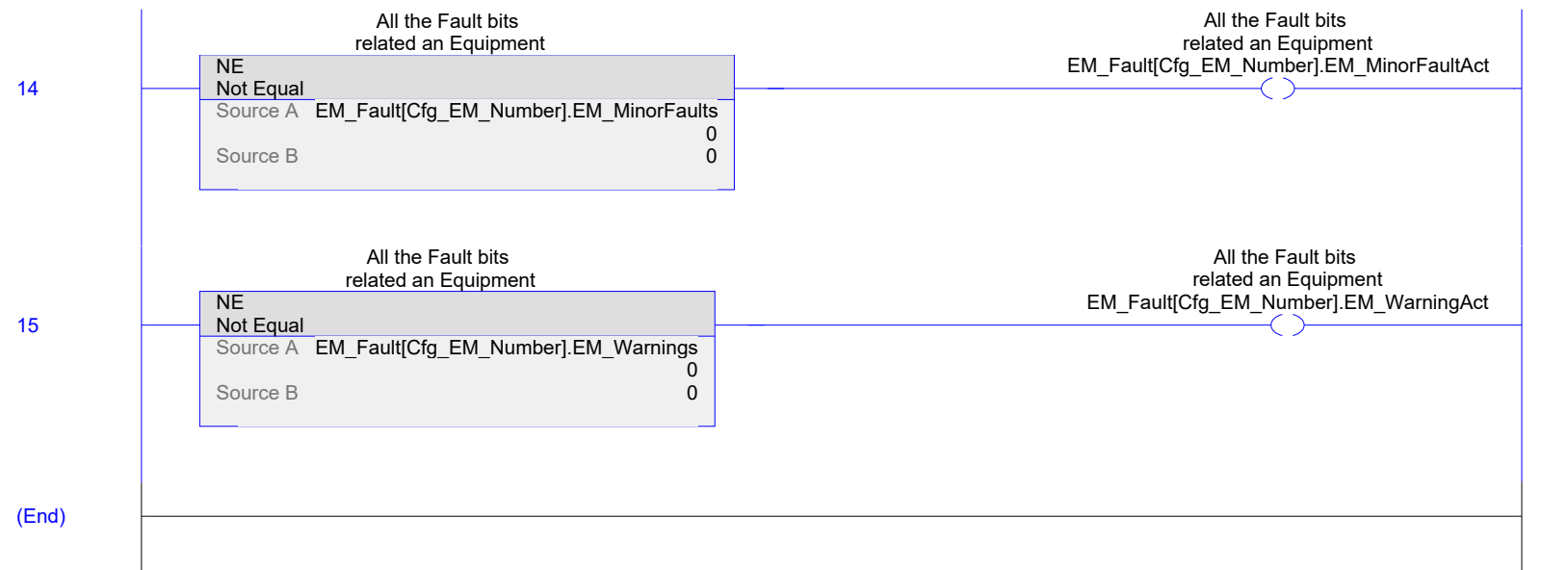
12



Summary of EM faults

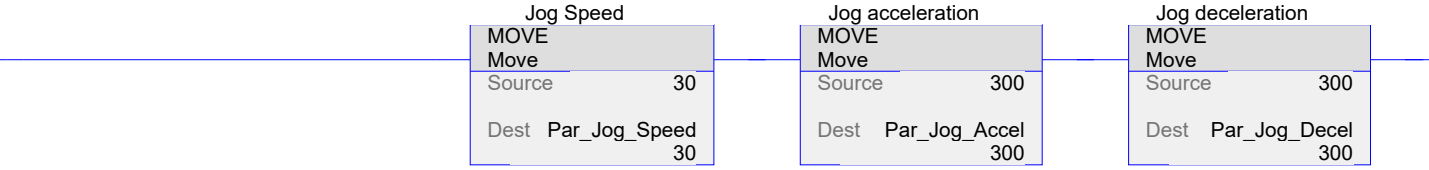
13



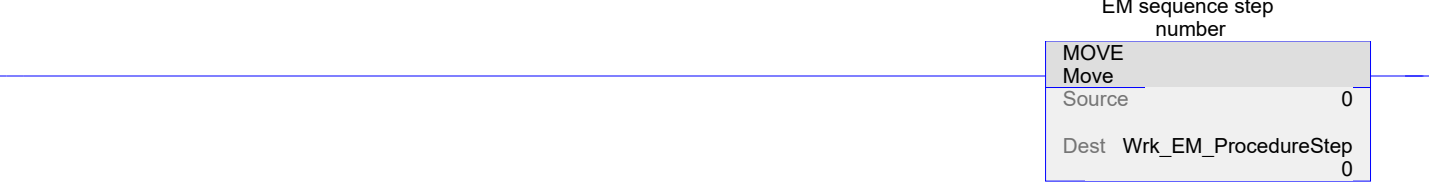


////////////////////////////////////  
 COMPANY: Rockwell Automation  
 FUNCTION: Initialize Equipment Module Data  
 AUTHOR: Rockwell Automation  
 DATE CREATED: March 2011  
 Version Comments:  
 //////////////////////////////////////

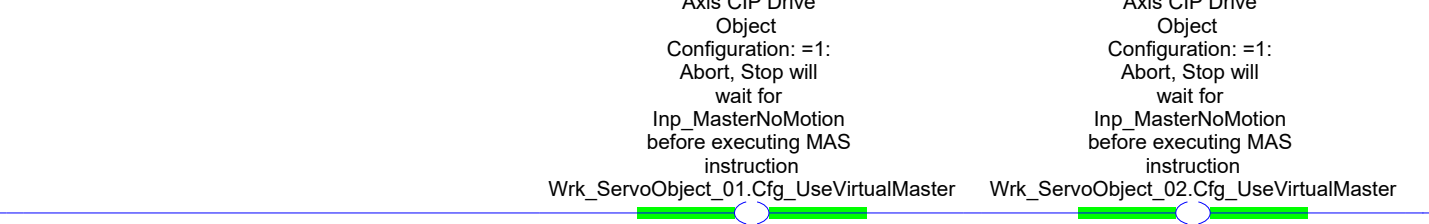
0 [NOP]



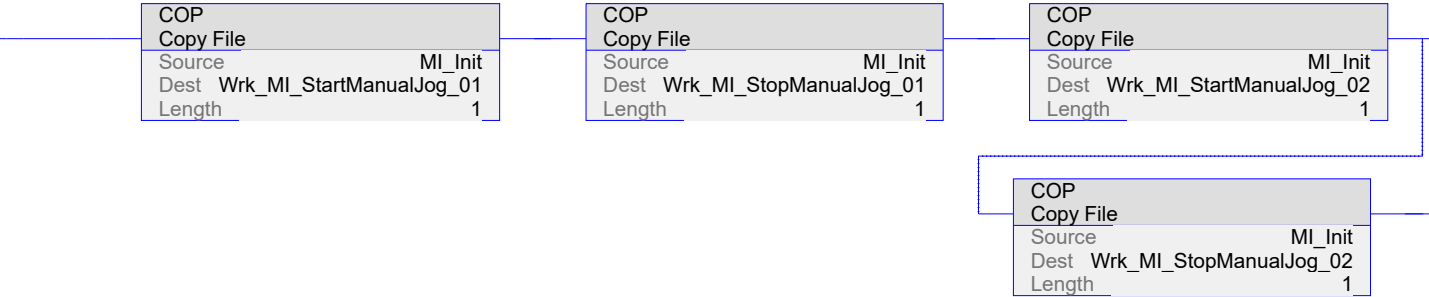
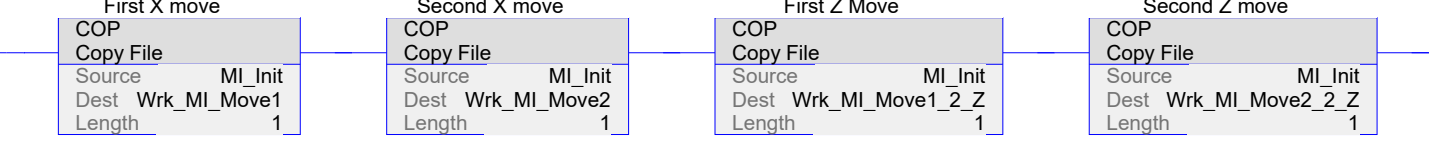
Clear EM procedure step



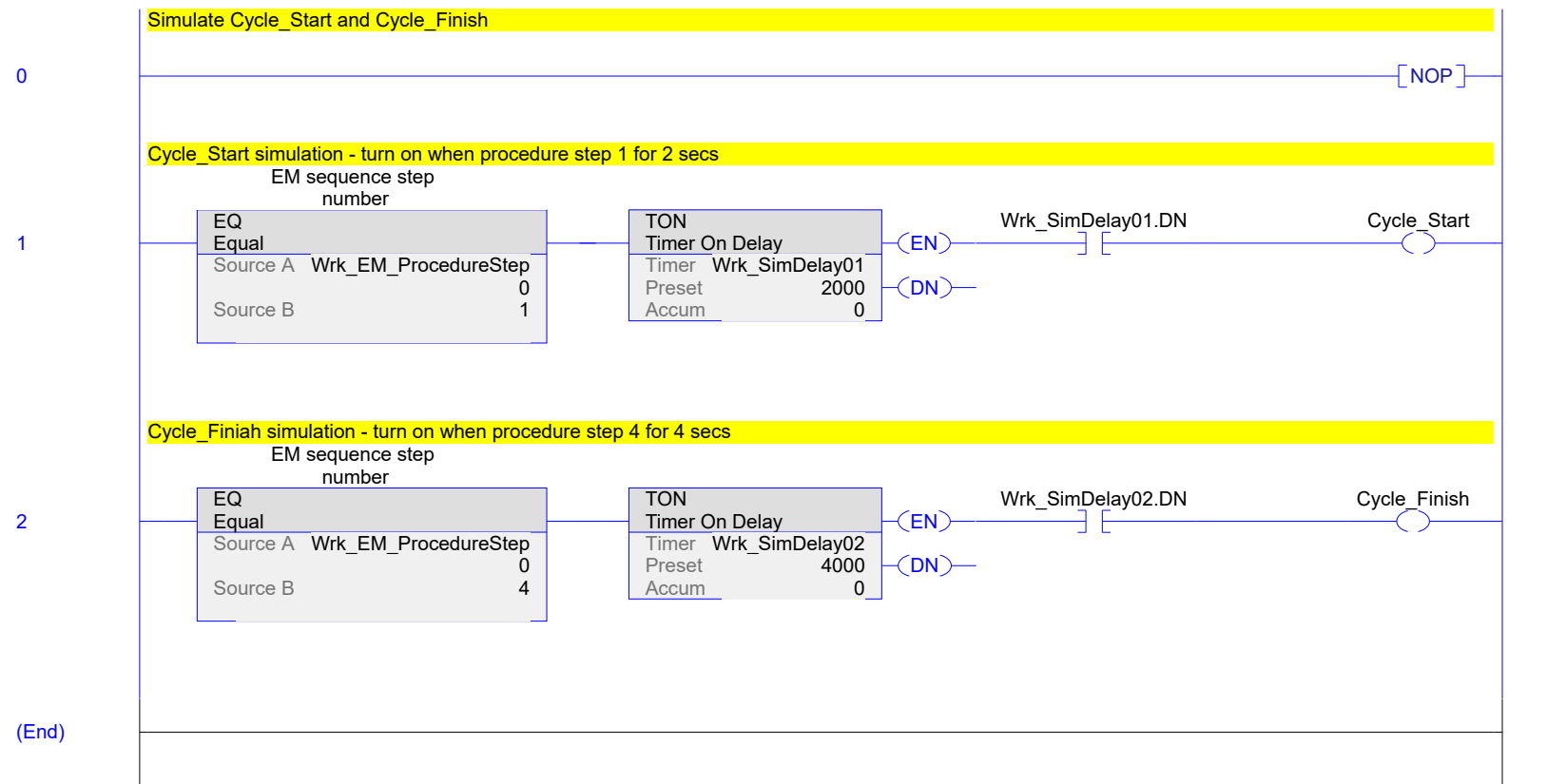
Both axes do not use a virtual master



Initialize motion instruction tags



(End)



## Signature Listing

### PackMLv3\_StateModel

Revision: v2.3

2.3 - Help File Updates

2.2 - ReOrder Sts Tags to reflect numerical TR88 state value

2.1 - Enable status added to reflect instruction scan

2.0 - AOI name update to reflect PML Model version

1.0 - Improved execution scantime

09/04/2009 - ETP - Edited Rung 14 to Enable

a) Held State IF Holding or UnHolding is Enabled

b) Suspended State IF Suspending or UnSuspending is Enabled

c) Complete State IF Completing is Enabled

Signature: 13B69801, 2025-11-22T23:04:43.760Z

Axis\_ObjectAV v2.2  
 Rockwell Automation

Available Languages

Relay Ladder

Axis_ObjectAV		
Axis_ObjectAV	? ...	(Sts_ER)
Ref_Axis_AV	?	(Sts_EnableDone)
Inp_MotionGroup	?	(Sts_DisableDone)
Cmd_Enable	?	(Sts_FaultResetDone)
	??	(Sts_HomeDone)
Cmd_Disable	?	(Sts_AbortDone)
	??	(Sts_StopDone)
Cmd_FaultReset	?	(Sts_AxisOk)
	??	(Sts_NoMotion)
Cmd_Home	?	(Sts_Homed)
	??	
Cmd_Abort	?	
	??	
Cmd_Stop	?	
	??	

Function Block

Axis_ObjectAV		
Ref_Axis_AV	?	
Inp_MotionGroup	?	
Cmd_Enable	Sts_ER	
Cmd_Disable	Sts_EnableDone	
Cmd_FaultReset	Sts_DisableDone	
Cmd_Home	Sts_FaultResetDone	
Cmd_Abort	Sts_HomeDone	
Cmd_Stop	Sts_AbortDone	
	Sts_StopDone	
	Sts_AxisOk	
	Sts_NoMotion	
	Sts_Homed	

Structured Text

Axis\_ObjectAV(Ref\_Axis\_AV, Inp\_MotionGroup, Cmd\_Enable, Cmd\_Disable, Cmd\_FaultReset, Cmd\_Home, Cmd\_Abort, Cmd\_Stop);

Parameters

Required	Name	Data Type	Usage	Description
X	Axis_ObjectAV	Axis_ObjectAV	InOut	
	EnableIn	BOOL	Input	
	EnableOut	BOOL	Output	
X	Ref_Axis_AV	AXIS_VIRTUAL	InOut	Axis that will be controlled and or viewed for status information
X	Inp_MotionGroup	MOTION_GROUP	InOut	Motion Group that will be viewed for status
	Cfg_HMIFPDisplay	DINT	Input	
	Cfg_UseVirtualMaster	BOOL	Input	Configuration: =1: Abort, Stop will wait for Inp_MasterNoMotion before executing MAS instruction
	Cfg_HomeEnabled	BOOL	Input	Configuration: =1: CMD_Home will execute MAH instruction = 0 no home instruction executed

	Cfg_StopEnabled	BOOL	Input	Configuration: =1: CMD_Stop will execute MAS instruction = 0 no stop instruction executed
	Cfg_AbortEnabled	BOOL	Input	Configuration: =1: CMD_Abort will execute MAS instruction = 0 no stop instruction executed
	Cfg_ZeroSpeedTolerance	REAL	Input	Zero Speed Tolerance Window in units/sec for Sts_NoMotion
	Cfg_AbortRamp	REAL	Input	Ramp for MAS instruction in aborting
	Cfg_StopRamp	REAL	Input	Ramp for MAS instruction in stopping
	Inp_MasterNoMotion	BOOL	Input	If Cfg_UseVirtualMaster=1: Abort, Stop will wait for Inp_MasterNoMotion before executing MAS instruction
X	Cmd_Enable	BOOL	Input	Enables the Axis
X	Cmd_Disable	BOOL	Input	Disables the Axis
X	Cmd_FaultReset	BOOL	Input	Fault Reset
X	Cmd_Home	BOOL	Input	Home the Axis, if Cfg_HomeEnabled = 1
X	Cmd_Abort	BOOL	Input	Stops the axis with AbortRamp Waits for Inp_MasterNoMotion if CfgUseVirtualMaster=1
X	Cmd_Stop	BOOL	Input	Stops the axis with StopRamp Waits for Inp_MasterNoMotion if CfgUseVirtualMaster=1
	Sts_ER	BOOL	Output	Any Fault occurred on this Axis
	Sts_EnableDone	BOOL	Output	Condition: Enable Done
	Sts_DisableDone	BOOL	Output	Condition: Disable Done
	Sts_FaultResetDone	BOOL	Output	Condition: Fault Reset Done
	Sts_HomeDone	BOOL	Output	Condition: Home Done
	Sts_AbortDone	BOOL	Output	Condition: Aborting Done
	Sts_StopDone	BOOL	Output	Condition: Stopping Done
	Sts_AxisOk	BOOL	Output	Status Display: Axis ready to enable
	Sts_NoMotion	BOOL	Output	AverageVelocity within ZeroSpeedTolerance and no MotionStatus set
	Sts_Homed	BOOL	Output	The Axis has been homed
	Err_General	BOOL	Output	Any General Fault
	Err_InstructionFault	BOOL	Output	Any instruction within the AOI faulted
	Err_MSOFault	BOOL	Output	MSO instruction Fault
	Err_MAHFault	BOOL	Output	MAH instruction Fault
	Err_MI_Err	DINT	Output	Motion instruction .ERR field if fault
	Err_MI_ExErr	DINT	Output	Motion instruction .EXERR field if fault
	Sts_Err	DINT	Output	

**Extended Description**

Instruction Overview:

The Axis Virtual Object Add-On Instruction performs Enable, Disable, Fault Reset, Home, Stop, Abort, Diagnostics, and Status functions of a physical axis.

Instruction Execution:

This AOI is intended to be scanned unconditionally

Supplemental Descriptions:

These configuration tags need to be configured for the AOI to work correctly:

- Cfg\_UseVirtualMaster
- Cfg\_StopEnabled
- Cfg\_HomeEnabled
- Cfg\_AbortEnabled

Prescan:

The Prescan routine executes after the primary Logic routine executes in Prescan mode. It will initialize tag values to a known or predefined state prior to execution of the AOI.

When an add-on instruction executes in Prescan mode, any required parameters have their data passed.

- Values are passed to input parameters from their arguments in the instruction call.
  - Values are passed from output parameters to their arguments defined in the instruction call.
- These values are passed even when the rung condition is false.

#### -Cmd\_Enable and Sts\_EnableDone-

When the command Cmd\_Enable is set, it is checked to see if the axis is ready to execute the MSO instruction (feedback on). When Cmd\_Enable is successfully executed, the Sts\_EnableDone bit will be set.

#### -Cmd\_Disable and Sts\_DisableDone-

When the command Cmd\_Disable is set, it is checked to see if the axis is ready to execute the MSF instruction (feedback off). When Cmd\_Disable is successfully executed, the Sts\_DisableDone bit will be set.

#### -Cmd\_FaultReset and Sts\_FaultResetDone-

When the command Cmd\_FaultReset is set, all Err-bits of the AOI are unlatched and the axis will be reset with a MASR instruction (Axis Shutdown Reset). When Cmd\_FaultReset is successfully executed, the Sts\_FaultResetDone bit will be set.

#### -Cmd\_Home, Sts\_Homed and Sts\_HomedDone-

When the command Cmd\_Home is set, a home sequence is initiated if the axis is configured to do a home. To configure the axis to home, the Cfg\_HomeEnabled bit must be set.

#### -Cfg\_HomeEnabled-

0 - Home instruction is not executed

1 - CMD\_Home will execute MAH instruction

When Cmd\_Home is successfully executed, the Sts\_Homed and Sts\_HomeDone bits will be set.

#### -Cmd\_Abort/Sts\_AbortDone and Cmd\_Stop/Sts\_StopDone-

The two commands Cmd\_Abort and Cmd\_Stop initiate a stop of the axis.

If configured to do so, the command Cmd\_Abort or Cmd\_Stop will set a deceleration rate used by the MAS instruction (axis stop).

#### Cfg\_AbortEnabled

0 - The axis does not execute the command

1 - The axis executes the command

#### Cfg\_StopEnabled

0 - The axis does not execute the command

1 - The axis executes the command

#### -Cfg\_UseVirtualMaster-

The axis can wait for the virtual master to be completely stopped before the MAS instruction is executed. If Cfg\_UseVirtualMaster is set, abort will wait for Inp\_MasterNoMotion before execution of the instruction. If not, it will be executed immediately.

#### -Cfg\_UseVirtualMaster-

0 - Abort, Stop will execute the MAS instruction immediately

1 - Abort, Stop will wait for Inp\_MasterNoMotion before executing MAS instruction

#### -Sts\_NoMotion-

When Sts\_NoMotion of the axis is detected and either a Cmd\_Abort or Cmd\_Stop command is set, either the Sts\_AbortDone or Sts\_StopDone status bit, as appropriate, will be set. 'No motion' is when none of the motion planner inputs (for example, gears, jogs, or CAMs) are active and the axis speed is less than the level configured in Cfg\_ZeroSpeedTolerance.

The motion planner inputs are masked with the MotionStatus (Motion planner input) set this way:

65407 [dec] = 1111 1111 0111 1111 [bin]

Bit	Description
00	AccelStatus
01	DecelStatus
02	MoveStatus
03	JogStatus
04	GearingStatus
05	HomingStatus
06	StoppingStatus
07	AxisHomedStatus
08	PositionCamStatus

09 TimeCamStatus  
10 PositionCamPendingStatus  
11 TimeCamPendingStatus  
12 GearingLockStatus  
13 PositionCamLockStatus  
14 MasterOffsetMoveStatus  
15 CoordinatedMotionStatus

---

#### General Information - Parameter Prefixing:

Inp\_  
-----

Input:

Generally used to designate a connection to a real I/O input point or an upstream block.

Set\_  
-----

Setpoint:

Used as a setpoint coming into the instruction. May come from the operator via the HMI, or from the controller program itself.

Cmd\_  
-----

Command:

Generally used to as a command input either from the operator via the HMI or from the program.

Cfg\_  
-----

Configuration:

Generally used to designate a configuration value.

Typically, but not always, something that is only changed irregularly.

Par\_  
-----

Parameter:

Equipment parameter or input parameter from Batching systems.

Generally used to designate a value that receives changes on a regular basis.

Wrk\_  
-----

Working Register:

In many cases the control routine will require some internal working storage locations.

This is targeted at the control routine that lies inside a normal UDT.

In the case of AOI's, these registers can simply become "Local Tags".

Out\_  
-----

Output:

Generally used to designate a connection to a real I/O output point or a downstream block.

Val\_  
-----

Value:

Designates a value calculated inside the instruction, which may or may not be the primary output of the instruction.

Rpt\_  
-----

Report:

Designates a value calculated inside the instruction that is typically used for batch reporting.

Sts\_

-----

Status:

Status of the instruction. Also contains two required members.

Ex.

Sts\_Alarm - An alarm exists. (Boolean)

Sts\_ER - The instruction itself has an error. (Boolean)

Alm\_

-----

Alarm:

Alarm indicators to display which actual alarm is occurring. All of these are Booleans.

Rdy\_

-----

Ready:

Command ready bits. Booleans determined inside the control routines to reflect whether the routine will allow state change commands.

Used with the HMI faceplates to enable or disable command buttons.

---

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## Execution

<u>Condition</u>	<u>Description</u>
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EnableIn is true	
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Prescan	
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## Revision v2.2 Notes

2.2 - v20 Update

2.1 - Help File Updaets

2.0 - AOI name update

1.0 - Initial Release

Name	Default	Data Type	Scope
<b>Cfg_AbortEnabled</b>	1	BOOL	Axis_ObjectAV
Configuration: =1: CMD_Abort will execute MAS instruction = 0 no stop instruction executed			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_AbortEnabled - Axis_ObjectAV/Logic - 10(XIC), 11(XIC)</i>			
<b>Cfg_AbortRamp</b>	100.0	REAL	Axis_ObjectAV
Ramp for MAS instruction in aborting			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_AbortRamp - Axis_ObjectAV/Logic - 10(MOVE)</i>			
<b>Cfg_HMIFPDisplay</b>	0	DINT	Axis_ObjectAV
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_HMIFPDisplay - Axis_ObjectAV/Logic - *14(MOVE)</i>			
<b>Cfg_HomeEnabled</b>	1	BOOL	Axis_ObjectAV
Configuration: =1: CMD_Home will execute MAH instruction = 0 no home instruction executed			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_HomeEnabled - Axis_ObjectAV/Logic - 6(XIC), 9(XIC)</i>			
<b>Cfg_StopEnabled</b>	1	BOOL	Axis_ObjectAV
Configuration: =1: CMD_Stop will execute MAS instruction = 0 no stop instruction executed			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_StopEnabled - Axis_ObjectAV/Logic - 10(XIC), 11(XIC)</i>			
<b>Cfg_StopRamp</b>	20.0	REAL	Axis_ObjectAV
Ramp for MAS instruction in stopping			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_StopRamp - Axis_ObjectAV/Logic - 10(MOVE)</i>			
<b>Cfg_UseVirtualMaster</b>	1	BOOL	Axis_ObjectAV
Configuration: =1: Abort, Stop will wait for Inp_MasterNoMotion before executing MAS instruction			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_UseVirtualMaster - Axis_ObjectAV/Logic - 10(XIO)</i>			

<b>Cfg_ZeroSpeedTolerance</b>	0.0	REAL	Axis_ObjectAV
Zero Speed Tolerance Window in units/sec for Sts_NoMotion			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_ZeroSpeedTolerance - Axis_ObjectAV/Logic - 1(LE)</i>			
<b>Cmd_Abort</b>	0	BOOL	Axis_ObjectAV
Stops the axis with AbortRamp Waits for Inp_MasterNoMotion if CfgUseVirtualMaster=1			
Usage:	Input Parameter		
Required:	Yes		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cmd_Abort - Axis_ObjectAV/Logic - 10(XIC), 11(XIC)</i>			
<b>Cmd_Disable</b>	0	BOOL	Axis_ObjectAV
Disables the Axis			
Usage:	Input Parameter		
Required:	Yes		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cmd_Disable - Axis_ObjectAV/Logic - 3(XIC)</i>			
<b>Cmd_Enable</b>	0	BOOL	Axis_ObjectAV
Enables the Axis			
Usage:	Input Parameter		
Required:	Yes		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cmd_Enable - Axis_ObjectAV/Logic - 2(XIC)</i>			
<b>Cmd_FaultReset</b>	0	BOOL	Axis_ObjectAV
Fault Reset			
Usage:	Input Parameter		
Required:	Yes		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cmd_FaultReset - Axis_ObjectAV/Logic - 4(XIC), 5(XIO)</i>			
<b>Cmd_Home</b>	0	BOOL	Axis_ObjectAV
Home the Axis, if Cfg_HomeEnabled = 1			
Usage:	Input Parameter		
Required:	Yes		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cmd_Home - Axis_ObjectAV/Logic - 6(XIC), 9(XIC)</i>			
<b>Cmd_Stop</b>	0	BOOL	Axis_ObjectAV
Stops the axis with StopRamp Waits for Inp_MasterNoMotion if CfgUseVirtualMaster=1			
Usage:	Input Parameter		
Required:	Yes		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cmd_Stop - Axis_ObjectAV/Logic - 10(XIC), 11(XIC)</i>			

<b>Err_InstructionFault</b>	0	BOOL	Axis_ObjectAV
Any instruction within the AOI faulted			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_InstructionFault - Axis_ObjectAV/Logic - *12(OTE), 13(XIC)</i>			
<b>Err_MI_Err</b>	0	DINT	Axis_ObjectAV
Motion instruction .ERR field if fault			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_MI_Err - Axis_ObjectAV/Logic - *10(MOVE), *4(MOVE), *4(MOVE), *4(MOVE), *7(MOVE)</i>			
<b>Err_MI_ExErr</b>	0	DINT	Axis_ObjectAV
Motion instruction .EXERR field if fault			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_MI_ExErr - Axis_ObjectAV/Logic - *10(MOVE), *4(MOVE), *4(MOVE), *4(MOVE), *7(MOVE)</i>			
<b>Inp_MasterNoMotion</b>	0	BOOL	Axis_ObjectAV
If Cfg_UseVirtualMaster=1: Abort, Stop will wait for Inp_MasterNoMotion before executing MAS instruction			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Inp_MasterNoMotion - Axis_ObjectAV/Logic - 10(XIC)</i>			
<b>Inp_MotionGroup</b>		MOTION_GROUP	Axis_ObjectAV
Motion Group that will be viewed for status			
Usage:	InOut Parameter		
Required:	Yes		
Visible:	Yes		
OPC UA Access:	None		
<b>Inp_MotionGroup.GroupStatus</b>	??	DINT	
Motion Group that will be viewed for status			
<b>Inp_MotionGroup.GroupStatus.1</b>	??	BOOL	
Motion Group that will be viewed for status			
<b>Inp_MotionGroup.InhibStatus</b>	??	BOOL	
Motion Group that will be viewed for status			
<b>Inp_MotionGroup.GroupSynced</b>	??	BOOL	
Motion Group that will be viewed for status			
<i>Inp_MotionGroup.GroupSynced - Axis_ObjectAV/Logic - 15(XIC)</i>			
<b>Inp_MotionGroup.AxisInhibitStatus</b>	??	BOOL	
Motion Group that will be viewed for status			
<b>Inp_MotionGroup.AxisTestModeStatus</b>	??	BOOL	
Motion Group that will be viewed for status			
<b>Inp_MotionGroup.GroupFault</b>	??	DINT	
Motion Group that will be viewed for status			
<b>Inp_MotionGroup.GroupOverlapFault</b>	??	BOOL	
Motion Group that will be viewed for status			
<b>Inp_MotionGroup.CSTLossFault</b>	??	BOOL	

<b>Inp_MotionGroup (Continued)</b>		
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.GroupTaskLoadingFault</b>	??	BOOL
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.ClockSyncFault</b>	??	BOOL
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.GroupAlarm</b>	??	DINT
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.ClockSyncAlarm</b>	??	BOOL
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.AxisFault</b>	??	DINT
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.PhysicalAxisFault</b>	??	BOOL
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.ModuleFault</b>	??	BOOL
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.ConfigFault</b>	??	BOOL
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.TaskMaxScanTime</b>	??	DINT
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.TaskLastScanTime</b>	??	DINT
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.TaskLastIOTime</b>	??	DINT
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.TaskMaxIOTime</b>	??	DINT
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.TaskAverageScanTime</b>	??	DINT
Motion Group that will be viewed for status		
<b>Inp_MotionGroup.TaskAverageIOTime</b>	??	DINT
Motion Group that will be viewed for status		
<b>Ref_Axis_AV</b>	AXIS_VIRTUAL	Axis_ObjectAV
Axis that will be controlled and or viewed for status information		
Usage:	InOut Parameter	
Required:	Yes	
Visible:	Yes	
OPC UA Access:	None	
<i>Ref_Axis_AV - Axis_ObjectAV/Logic - 10(MAS), 4(MAFR), 4(MASR), 7(MAH)</i>		
<b>Ref_Axis_AV.AxisFault</b>	??	DINT
Axis that will be controlled and or viewed for status information		
<i>Ref_Axis_AV.AxisFault - Axis_ObjectAV/Logic - 13(NE)</i>		
<b>Ref_Axis_AV.AxisFault.1</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.AxisFault.2</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.PhysicalAxisFault</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.ModuleFault</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<i>Ref_Axis_AV.ModuleFault - Axis_ObjectAV/Logic - 15(XIO)</i>		
<b>Ref_Axis_AV.ConfigFault</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<i>Ref_Axis_AV.ConfigFault - Axis_ObjectAV/Logic - 13(XIC)</i>		
<b>Ref_Axis_AV.GroupFault</b>	??	BOOL

<b>Ref_Axis_AV (Continued)</b>		
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.AxisStatus</b>	??	DINT
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.AxisStatus.2</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.ServoActionStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<i>Ref_Axis_AV.ServoActionStatus - Axis_ObjectAV/Logic - 2(XIC)</i>		
<b>Ref_Axis_AV.DriveEnableStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.ShutdownStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<i>Ref_Axis_AV.ShutdownStatus - Axis_ObjectAV/Logic - 15(XIO)</i>		
<b>Ref_Axis_AV.ConfigUpdateInProgress</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.InhibitStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.DirectControlStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.AxisUpdateStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.MotionStatus</b>	??	DINT
Axis that will be controlled and or viewed for status information		
<i>Ref_Axis_AV.MotionStatus - Axis_ObjectAV/Logic - 1(MEQ)</i>		
<b>Ref_Axis_AV.AccelStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.DecelStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.MoveStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.JogStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.GearingStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.HomingStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.StoppingStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.AxisHomedStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.PositionCamStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.TimeCamStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.PositionCamPendingStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.TimeCamPendingStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.GearingLockStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.PositionCamLockStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.TimeCamLockStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.MasterOffsetMoveStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.CoordinatedMotionStatus</b>		

<b>Ref_Axis_AV (Continued)</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.TransformStateStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.ControlledByTransformStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.MoveLockStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.JogLockStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.MasterOffsetMoveLockStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.MaximumSpeedExceeded</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.AxisEvent</b>	??	DINT
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.WatchEventArmedStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.WatchEventStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.RegEvent1ArmedStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.RegEvent1Status</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.RegEvent2ArmedStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.RegEvent2Status</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.HomeEventArmedStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.HomeEventStatus</b>	??	BOOL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.OutputCamStatus</b>	??	DINT
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.OutputCamPendingStatus</b>	??	DINT
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.OutputCamLockStatus</b>	??	DINT
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.OutputCamTransitionStatus</b>	??	DINT
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.ActualPosition</b>	??	REAL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.StrobeActualPosition</b>	??	REAL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.StartActualPosition</b>	??	REAL
Axis that will be controlled and or viewed for status information		
<b>Ref_Axis_AV.AverageVelocity</b>	??	REAL
Axis that will be controlled and or viewed for status information		
<i>Ref_Axis_AV.AverageVelocity - Axis_ObjectAV/Logic - I(ABS)</i>		
<b>Ref_Axis_AV.ActualVelocity</b>	??	REAL
Axis that will be controlled and or viewed for status information		

**Ref\_Axis\_AV (Continued)**

<b>Ref_Axis_AV.ActualAcceleration</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.WatchPosition</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.Registration1Position</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.Registration2Position</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.Registration1Time</b>	??	DINT	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.Registration2Time</b>	??	DINT	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.InterpolationTime</b>	??	DINT	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.InterpolatedActualPosition</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.InterpolatedCommandPosition</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.MasterOffset</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.StrobeMasterOffset</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.StartMasterOffset</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.CommandPosition</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.StrobeCommandPosition</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.StartCommandPosition</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.CommandVelocity</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Ref_Axis_AV.CommandAcceleration</b>	??	REAL	
Axis that will be controlled and or viewed for status information			
<b>Sts_AbortDone</b>	0	BOOL	Axis_ObjectAV
Condition: Aborting Done			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_AbortDone - Axis_ObjectAV/Logic - *11(O TE)</i>			
<b>Sts_AxisOk</b>	0	BOOL	Axis_ObjectAV
Status Display: Axis ready to enable			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_AxisOk - Axis_ObjectAV/Logic - *15(O TE)</i>			
<b>Sts_DisableDone</b>	0	BOOL	Axis_ObjectAV
Condition: Disable Done			
Usage:	Output Parameter		
Required:	No		

<b>Sts_DisableDone (Continued)</b>			
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_DisableDone - Axis_ObjectAV/Logic - *3(OTE)</i>			
<b>Sts_EnableDone</b>	0	BOOL	Axis_ObjectAV
Condition: Enable Done			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_EnableDone - Axis_ObjectAV/Logic - *2(OTE)</i>			
<b>Sts_ER</b>	0	BOOL	Axis_ObjectAV
Any Fault occured on this Axis			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_ER - Axis_ObjectAV/Logic - *13(OTE), 14(XIC), 15(XIO), 5(XIO)</i>			
<i>Sts_ER - Axis_ObjectAV/Prescan - *0(OTU)</i>			
<b>Sts_Err</b>	0	DINT	Axis_ObjectAV
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_Err - Axis_ObjectAV/Logic - *10(MOVE), *4(MOVE), *4(MOVE), *4(MOVE), *7(MOVE), 12(NE)</i>			
<b>Sts_FaultResetDone</b>	0	BOOL	Axis_ObjectAV
Condition: Fault Reset Done			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_FaultResetDone - Axis_ObjectAV/Logic - *5(OTL), *5(OTU)</i>			
<b>Sts_Homed</b>	0	BOOL	Axis_ObjectAV
The Axis has been homed			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_Homed - Axis_ObjectAV/Logic - *6(OTU), *8(OTL), 9(XIC)</i>			
<i>Sts_Homed - Axis_ObjectAV/Prescan - *0(OTU)</i>			
<b>Sts_HomeDone</b>	0	BOOL	Axis_ObjectAV
Condition: Home Done			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_HomeDone - Axis_ObjectAV/Logic - *9(OTE)</i>			
<b>Sts_NoMotion</b>	0	BOOL	Axis_ObjectAV
AverageVelocity within ZeroSpeedTolerance and no MotionStatus set			

**Sts\_NoMotion (Continued)**

Usage: Output Parameter  
Required: No  
Visible: Yes  
External Access: Read Only  
OPC UA Access: None  
*Sts\_NoMotion - Axis\_ObjectAV/Logic - \*I(OTE), I1(XIC)*

**Sts\_StopDone** 0 BOOL Axis\_ObjectAV

Condition: Stopping Done  
Usage: Output Parameter  
Required: No  
Visible: Yes  
External Access: Read Only  
OPC UA Access: None  
*Sts\_StopDone - Axis\_ObjectAV/Logic - \*I1(OTE)*

Name	Default	Data Type	Scope
<b>AverageVelocity</b>	0.0	REAL	Axis_ObjectAV
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>AverageVelocity - Axis_ObjectAV/Logic - *1(ABS), 1(LE)</i>			
<b>DecelRate</b>	0.0	REAL	Axis_ObjectAV
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>DecelRate - Axis_ObjectAV/Logic - *10(MOVE), *10(MOVE), 10(MAS)</i>			
<b>FaultReset_delay</b>		TIMER	Axis_ObjectAV
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>FaultReset_delay - Axis_ObjectAV/Logic - *5(TON)</i>			
<b>FaultReset_delay.DN</b>	0	BOOL	
<i>FaultReset_delay.DN - Axis_ObjectAV/Logic - 5(XIC)</i>			
<b>HomeSequence</b>	0	DINT	Axis_ObjectAV
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>HomeSequence - Axis_ObjectAV/Logic - *6(MOVE), *7(MOVE), *8(MOVE), 7(EQ), 8(EQ)</i>			
<i>HomeSequence - Axis_ObjectAV/Prescan - *0(MOVE)</i>			
<b>HomeStart</b>	0	BOOL	Axis_ObjectAV
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>HomeStart - Axis_ObjectAV/Logic - *6(ONS)</i>			
<b>Sts_ER_ONS</b>	0	BOOL	Axis_ObjectAV
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Sts_ER_ONS - Axis_ObjectAV/Logic - *14(ONS)</i>			
<b>Wrk_MI_FaultReset</b>		MOTION_INSTRUCTION	Axis_ObjectAV
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
<i>Wrk_MI_FaultReset - Axis_ObjectAV/Logic - *4(MAFR)</i>			
<b>Wrk_MI_FaultReset.ER</b>	0	BOOL	
<i>Wrk_MI_FaultReset.ER - Axis_ObjectAV/Logic - 4(XIC)</i>			
<b>Wrk_MI_FaultReset.ERR</b>	0	INT	
<i>Wrk_MI_FaultReset.ERR - Axis_ObjectAV/Logic - 4(MOVE)</i>			
<b>Wrk_MI_FaultReset.EXERR</b>	0	SINT	
<i>Wrk_MI_FaultReset.EXERR - Axis_ObjectAV/Logic - 4(MOVE)</i>			
<b>Wrk_MI_Home</b>		MOTION_INSTRUCTION	Axis_ObjectAV
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Wrk_MI_Home - Axis_ObjectAV/Logic - *7(MAH)</i>			
<b>Wrk_MI_Home.ER</b>	0	BOOL	
<i>Wrk_MI_Home.ER - Axis_ObjectAV/Logic - 7(XIC)</i>			
<b>Wrk_MI_Home.PC</b>	0	BOOL	
<i>Wrk_MI_Home.PC - Axis_ObjectAV/Logic - 8(XIC)</i>			
<b>Wrk_MI_Home.ERR</b>	0	INT	
<i>Wrk_MI_Home.ERR - Axis_ObjectAV/Logic - 7(MOVE)</i>			

**Wrk\_MI\_Home (Continued)**

**Wrk\_MI\_Home.EXERR** 0 SINT  
*Wrk\_MI\_Home.EXERR - Axis\_ObjectAV/Logic - 7(MOVE)*

**Wrk\_MI\_ShutdownReset** MOTION\_INSTRUCTION Axis\_ObjectAV

Usage: Local Tag  
 External Access: Read/Write  
 OPC UA Access: None

*Wrk\_MI\_ShutdownReset - Axis\_ObjectAV/Logic - \*4(MASR)*

**Wrk\_MI\_ShutdownReset.DN** 0 BOOL  
*Wrk\_MI\_ShutdownReset.DN - Axis\_ObjectAV/Logic - 5(XIC)*

**Wrk\_MI\_ShutdownReset.ER** 0 BOOL  
*Wrk\_MI\_ShutdownReset.ER - Axis\_ObjectAV/Logic - 4(XIC), 5(XIC)*

**Wrk\_MI\_ShutdownReset.ERR** 0 INT  
*Wrk\_MI\_ShutdownReset.ERR - Axis\_ObjectAV/Logic - 4(MOVE)*

**Wrk\_MI\_ShutdownReset.EXERR** 0 SINT  
*Wrk\_MI\_ShutdownReset.EXERR - Axis\_ObjectAV/Logic - 4(MOVE)*

**Wrk\_MI\_Stop** MOTION\_INSTRUCTION Axis\_ObjectAV

Usage: Local Tag  
 External Access: Read/Write  
 OPC UA Access: None

*Wrk\_MI\_Stop - Axis\_ObjectAV/Logic - \*10(MAS)*

**Wrk\_MI\_Stop.ER** 0 BOOL  
*Wrk\_MI\_Stop.ER - Axis\_ObjectAV/Logic - 10(XIC)*

**Wrk\_MI\_Stop.ERR** 0 INT  
*Wrk\_MI\_Stop.ERR - Axis\_ObjectAV/Logic - 10(MOVE)*

**Wrk\_MI\_Stop.EXERR** 0 SINT  
*Wrk\_MI\_Stop.EXERR - Axis\_ObjectAV/Logic - 10(MOVE)*

**Wrk\_ONS\_Init** 0 BOOL Axis\_ObjectAV

Usage: Local Tag  
 External Access: None  
 OPC UA Access: None

*Wrk\_ONS\_Init - Axis\_ObjectAV/Logic - \*4(ONS)*

```

*****
COMPANY:      Rockwell Automation
FUNCTION:     Virtual Axis Object
AUTHOR:      Rockwell Automation
DATE CREATED: March 4 2009

Version Comments:

*****
    
```

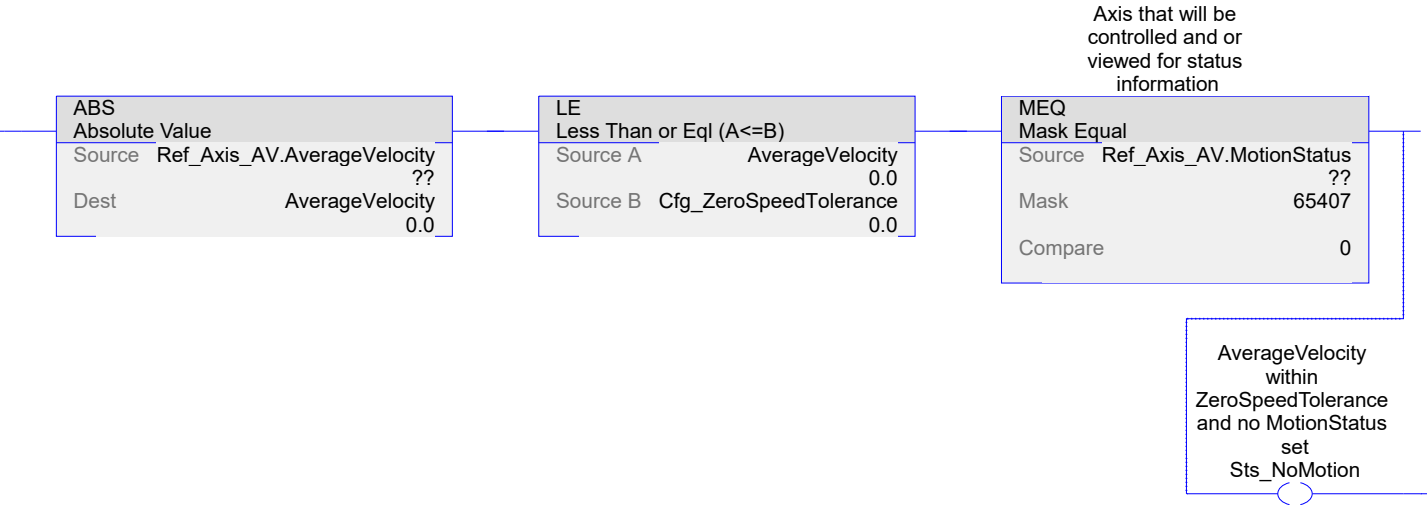
0 [NOP]

THIS RUNG IS USED TO VERIFY THAT ALL MOTION PLANER INPUTs (GEARs, JOGs, CAMs etc.) ARE NOT ACTIVE AND AXIS SPEED IS LESS THAN SOME SET LEVEL

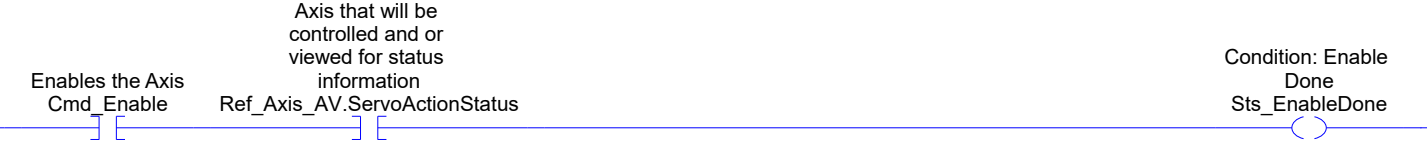
No motion state

Description : MotionStatus  
 Bit 00 AccelStatus  
 Bit 01 DecelStatus  
 Bit 02 MoveStatus  
 Bit 03 JogStatus  
 Bit 04 GearingStatus  
 Bit 05 HomingStatus  
 Bit 06 StoppingStatus  
 Bit 07 AxisHomedStatus  
 Bit 08 PositionCamStatus  
 Bit 09 TimeCamStatus  
 Bit 10 PositionCamPendingStatus  
 Bit 11 TimeCamPendingStatus  
 Bit 12 GearingLockStatus  
 Bit 13 PositionCamLockStatus  
 Bit 14 MasterOffsetMoveStatus  
 Bit 15 CoordinatedMotionStatus

65407 = 1111 1111 0111 1111

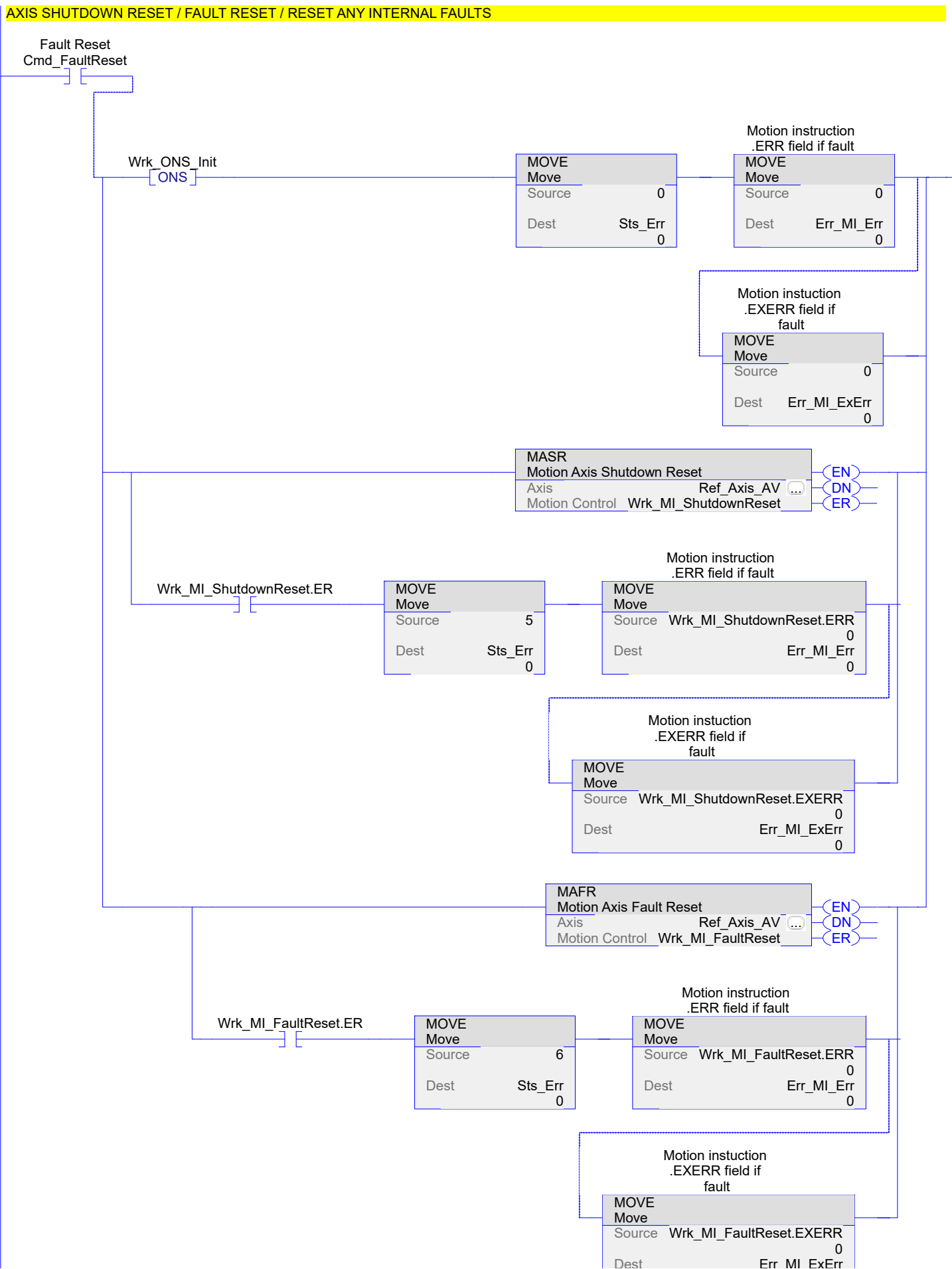


**ENABLE AXIS (CLOSE SERVOLOOP)**



**DISABLE AXIS (OPEN SERVOLOOP)**

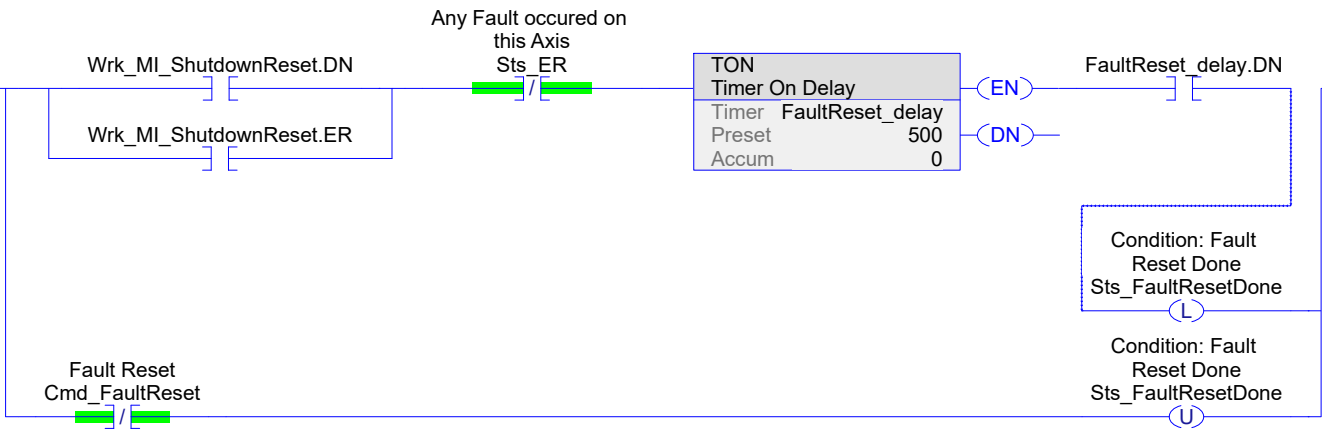




0

**FAULT RESET DONE / HANDSHAKE**

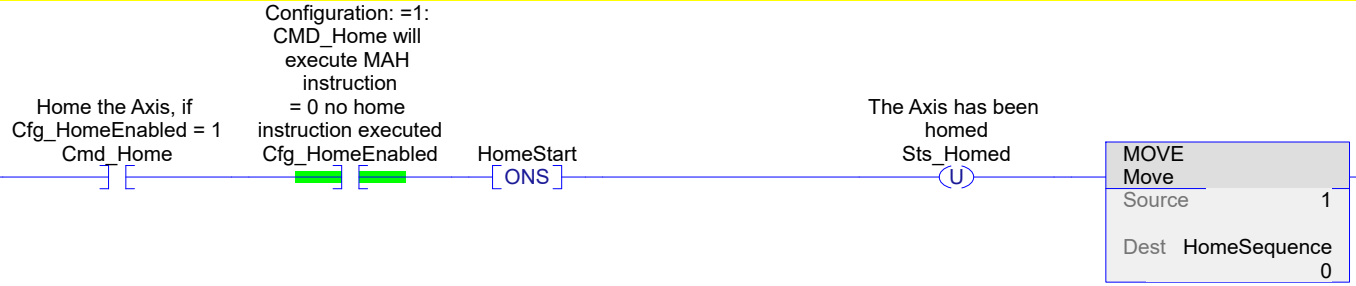
5



**- SECTION AXIS HOMING**

HOME COMMAND, TO INITIATE THE HOME SEQUENCE

6



7

**HOME SEQUENCE EXECUTION (CONFIGURATION VIA AXIS PROPERTIES WIZARDS)**

EQ	Equal
Source A	HomeSequence 0
Source B	1

MAH	Motion Axis Ho
Axis	Motion Control

Wrk\_MI\_Home.ER

MOVE	Move
Source	7
Dest	Sts_Err 0

Motion instruction  
 .ERR field if fault

MOVE	Move
Source	Wrk_MI_Home.ERR 0
Dest	Err_MI_Err 0

MOVE	Move
Source	
Dest	

Ref_Axis_AV	...
Wrk_MI_Home	

- (EN)
- (DN)
- (ER)
- (IP)
- (PC)

MOVE	Move
Source	2
Dest	HomeSequence 0

Motion instruction  
 .EXERR field if  
 fault

Wrk_MI_Home.EXERR	0
Err_MI_ExErr	0

8

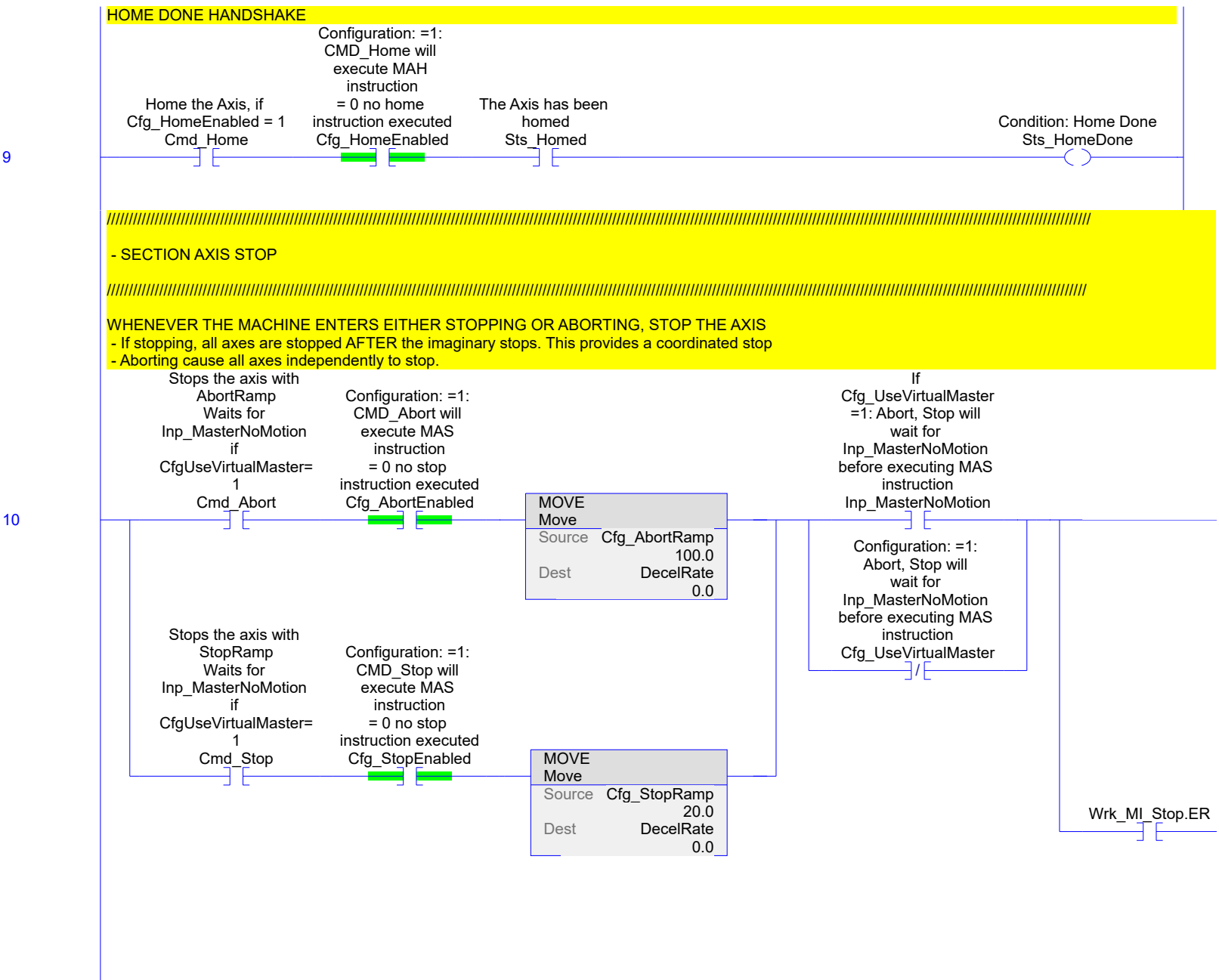
**AXIS IS HOMED**

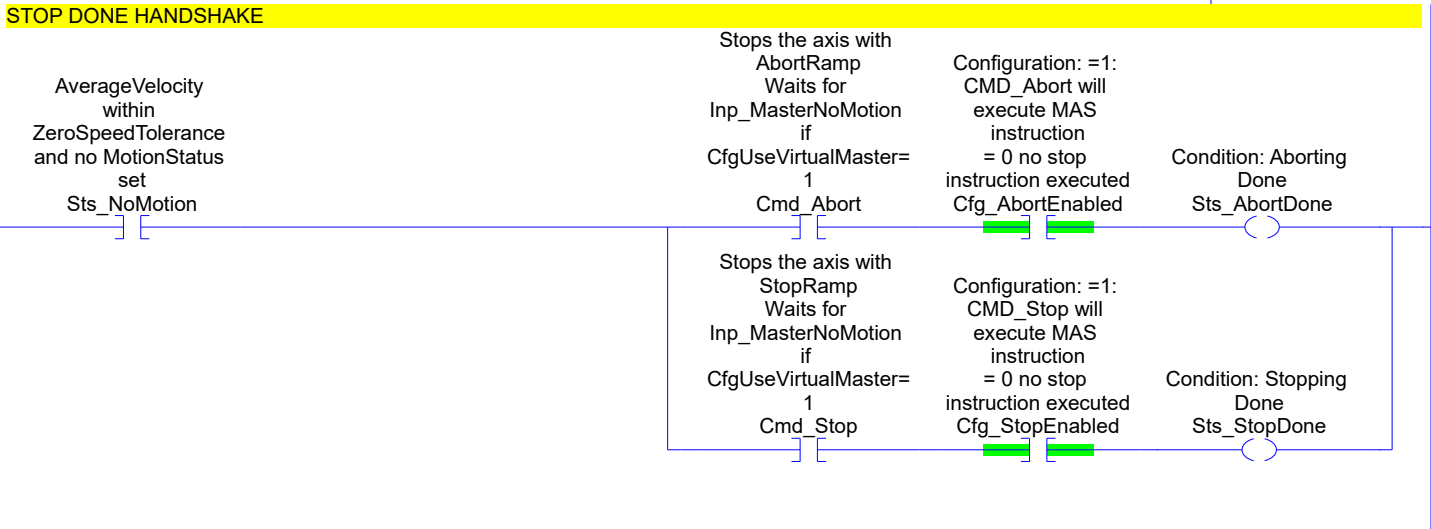
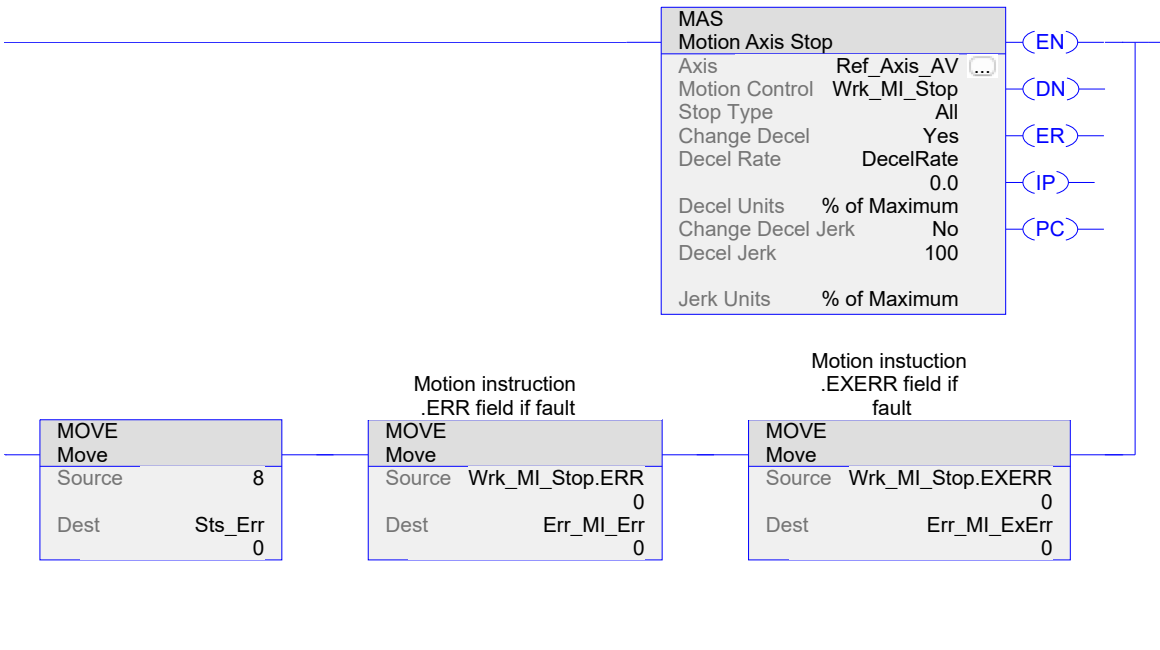
EQ	Equal
Source A	HomeSequence 0
Source B	2

Wrk\_MI\_Home.PC

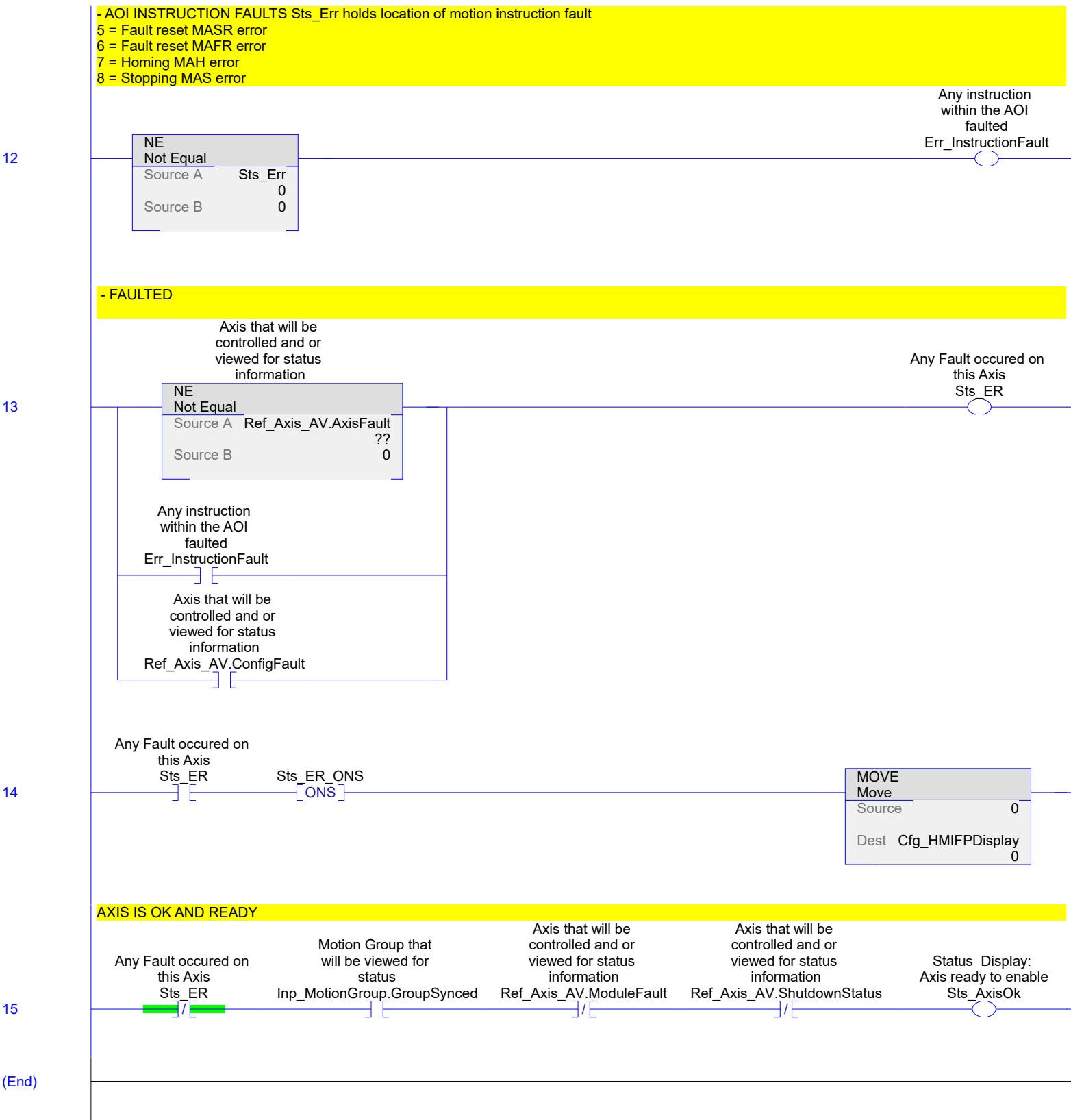
MOVE	Move
Source	3
Dest	HomeSequence 0

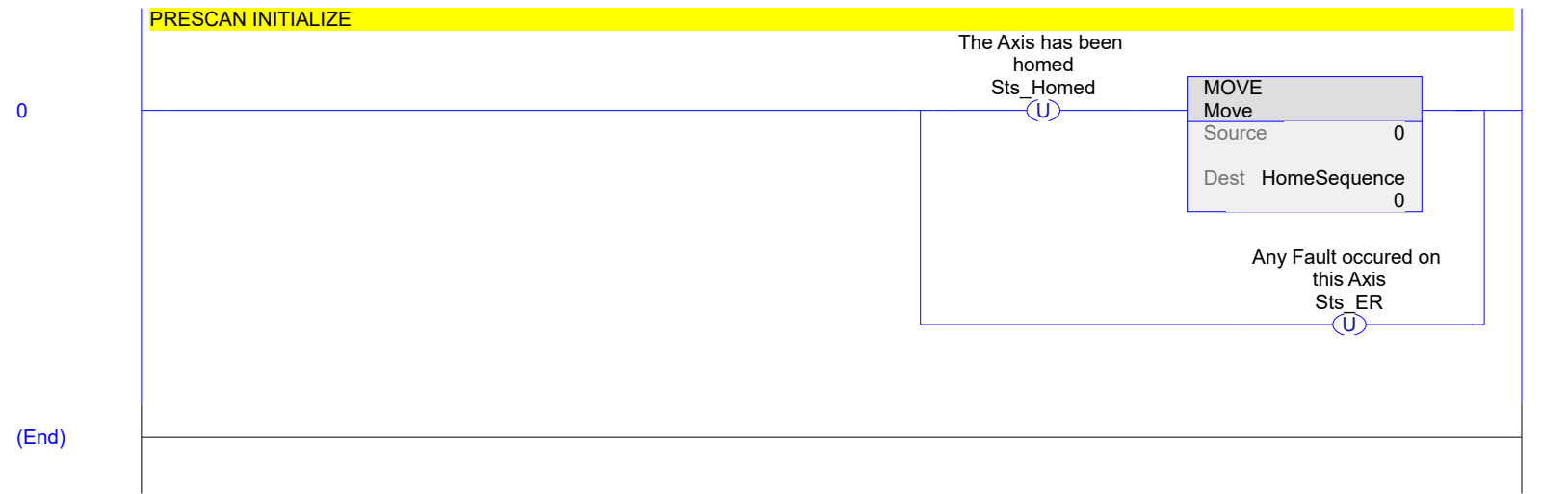
The Axis has been  
 homed  
 Sts\_Homed (L)





11





**Axis\_ObjectCD v1.13**

Rockwell Automation

Axis CIP Drive Object

**Available Languages**

**Relay Ladder**

Axis_ObjectCD	
Axis CIP Drive Object	
Axis_ObjectCD	? (...)-(Sts_ER)
Ref_Axis_CD	?-(Sts_EnableDone)
Inp_MotionGroup	?-(Sts_DisableDone)
Cmd_Enable	?-(Sts_FaultResetDone)
	??-(Sts_HomeDone)
Cmd_Disable	?-(Sts_AbortDone)
	??-(Sts_StopDone)
Cmd_FaultReset	?-(Sts_CIP_StartInhibitActive)
	??-(Sts_AxisOk)
Cmd_Home	?-(Sts_NoMotion)
	??-(Sts_Homed)
Cmd_Abort	?
	??
Cmd_Stop	?
	??

**Function Block**

Axis_ObjectCD	
Axis CIP Drive Object	
Ref_Axis_CD	?
Inp_MotionGroup	?
Cmd_Enable	Sts_ER
Cmd_Disable	Sts_EnableDone
Cmd_FaultReset	Sts_DisableDone
Cmd_Home	Sts_FaultResetDone
Cmd_Abort	Sts_HomeDone
Cmd_Stop	Sts_AbortDone
	Sts_StopDone
	Sts_CIP_StartInhibitActive
	Sts_AxisOk
	Sts_NoMotion
	Sts_Homed

**Structured Text**

Axis\_ObjectCD(Ref\_Axis\_CD, Inp\_MotionGroup, Cmd\_Enable, Cmd\_Disable, Cmd\_FaultReset, Cmd\_Home, Cmd\_Abort, Cmd\_Stop);

**Parameters**

Required	Name	Data Type	Usage	Description
X	Axis_ObjectCD	Axis_ObjectCD	InOut	Axis CIP Drive Object
	EnableIn	BOOL	Input	
	EnableOut	BOOL	Output	
	Cfg_UseVirtualMaster	BOOL	Input	Configuration: =1: Abort, Stop will wait for Inp_MasterNoMotion before executing MAS instruction

	Cfg_HomeEnabled	BOOL	Input	Configuration: =1: CMD_Home will execute MAH instruction = 0 no home instruction executed
	Cfg_StopEnabled	BOOL	Input	Configuration: =1: CMD_Stop will execute MAS instruction = 0 no stop instruction executed
	Cfg_AbortEnabled	BOOL	Input	Configuration: =1: CMD_Abort will execute MAS instruction = 0 no stop instruction executed
	Cfg_ZeroSpeedTolerance	REAL	Input	Zero Speed Tolerance Window in units/sec for Sts_NoMotion
	Cfg_AbortRamp	REAL	Input	Ramp for MAS instruction in aborting
	Cfg_StopRamp	REAL	Input	Ramp for MAS instruction in stopping
	Inp_MasterNoMotion	BOOL	Input	If Cfg_UseVirtualMaster=1: Abort, Stop will wait for Inp_MasterNoMotion before executing MAS instruction
X	Ref_Axis_CD	AXIS_CIP_DRIVE	InOut	Servo Axis, Data type Axis CIP Drive
X	Inp_MotionGroup	MOTION_GROUP	InOut	Motion Group
X	Cmd_Enable	BOOL	Input	Enables the Axis
X	Cmd_Disable	BOOL	Input	Disables the Axis
X	Cmd_FaultReset	BOOL	Input	Fault Reset
X	Cmd_Home	BOOL	Input	Home the Axis, if Cfg_HomeEnabled = 1
X	Cmd_Abort	BOOL	Input	Stops the axis with AbortRamp Waits for Inp_MasterNoMotion if CfgUseVirtualMaster=1
X	Cmd_Stop	BOOL	Input	Stops the axis with StopRamp Waits for Inp_MasterNoMotion if CfgUseVirtualMaster=1
	Sts_ER	BOOL	Output	Any Fault occured on this Axis
	Sts_EnableDone	BOOL	Output	Condition: Enable Done
	Sts_DisableDone	BOOL	Output	Condition: Disable Done
	Sts_FaultResetDone	BOOL	Output	Condition: Fault Reset Done
	Sts_HomeDone	BOOL	Output	Condition: Home Done
	Sts_AbortDone	BOOL	Output	Condition: Aborting Done
	Sts_StopDone	BOOL	Output	Condition: Stopping Done
	Sts_CIP_StartInhibitActive	BOOL	Output	
	Sts_AxisOk	BOOL	Output	Status Display: Axis ready to enable
	Sts_AbsoluteReferenceStatus	BOOL	Output	Absolute Feedback device shows Reference Ok
	Sts_NoMotion	BOOL	Output	AverageVelocity within ZeroSpeedTolerance and no MotionStatus set
	Sts_Homed	BOOL	Output	The Axis has been homed
	Err_PosOvertravel	BOOL	Output	Any positive Overtravel Fault
	Err_NegOvertravel	BOOL	Output	Any neagtive Overtravel Fault
	Err_FeedbackFault	BOOL	Output	Any Feedback Fault including Aux Feedback
	Err_DeviceCommunication	BOOL	Output	Any General Fault
	Err_PowerFault	BOOL	Output	Any Overload/Voltage Fault
	Err_TemperatureFault	BOOL	Output	Any Temperature Fault
	Err_PositionError	BOOL	Output	Position Error window exceeded
	Err_GuardFault	BOOL	Output	Any Guard Fault (Safety Fault)
	Err_InstructionFault	BOOL	Output	Any instruction within the AOI faulted
	Out_AxisCipState	DINT	Output	CipState
	Cfg_HMIFPDisplay	DINT	Input	HMI Display tag used with HMI Global Object
	Sts_Err	DINT	Output	
	Err_MI_Err	DINT	Output	Motion instruction .ERR field if fault
	Err_MI_ExErr	DINT	Output	Motion instuction .EXERR field if fault

**Extended Description**

Instruction Overview:

The Axis Cip Drive Object Add-On Instruction performs Enable, Disable, Fault Reset, Home, Stop, Abort, Diagnostics, and Status functions of a physical axis.

The AOI consists of Parameters and Local Tags, and a routine for Logic and Prescan.

Instruction Execution:

This instruction is intended to be executed unconditionally.

Supplemental Descriptions:

-----

These configuration tags need to be configured for the AOI to work correctly:

- Cfg\_UseVirtualMaster
- Cfg\_StopEnabled
- Cfg\_HomeEnabled
- Cfg\_AbortEnabled

#### Prescan

The Prescan routine executes after the primary Logic routine executes in Prescan mode. It will initialize tag values to a known or predefined state prior to execution of the AOI.

When an add-on instruction executes in Prescan mode, any required parameters have their data passed.

Values are passed to input parameters from their arguments in the instruction call.

Values are passed from output parameters to their arguments defined in the instruction call.

These values are passed even when the rung condition is false.

#### Cmd\_Enable and Sts\_EnableDone

When the command Cmd\_Enable is set, it is checked to see if the axis is ready to execute the MSO instruction (feedback on). When Cmd\_Enable is successfully executed, the Sts\_EnableDone bit will be set.

#### Cmd\_Disable and Sts\_DisableDone

When the command Cmd\_Disable is set, it is checked to see if the axis is ready to execute the MSF instruction (feedback off). When Cmd\_Disable is successfully executed, the Sts\_DisableDone bit will be set.

#### Cmd\_FaultReset and Sts\_FaultResetDone

When the command Cmd\_FaultReset is set, all Err-bits of the AOI are unlatched and the axis will be reset with a MASR instruction (Axis Shutdown Reset). When Cmd\_FaultReset is successfully executed, the Sts\_FaultResetDone bit will be set.

#### Cmd\_Home, Sts\_Homed and Sts\_HomedDone

When the command Cmd\_Home is set, a home sequence is initiated if the axis is configured to do a home. To configure the axis to home, the Cfg\_HomeEnabled bit must be set.

Cfg_HomeEnabled	Behavior
0	Home instruction is not executed
1	CMD_Home will execute MAH instruction

When Cmd\_Home is successfully executed, the Sts\_Homed and Sts\_HomeDone bits will be set.

#### Cmd\_Abort/Sts\_AbortDone and Cmd\_Stop/Sts\_StopDone

The two commands Cmd\_Abort and Cmd\_Stop initiate a stop of the axis.

If configured to do so, the command Cmd\_Abort or Cmd\_Stop will set a deceleration rate used by the MAS instruction (axis stop).

Cfg_AbortEnabled	Cfg_StopEnabled	Behavior
0	0	The axis does not execute the command
1	1	The axis executes the command

The axis can wait for the virtual master to be completely stopped before the MAS instruction is executed. If Cfg\_UseVirtualMaster is set, abort will wait for Inp\_MasterNoMotion before execution of the instruction. If not, it will be executed immediately.

#### Cfg\_UseVirtualMaster Behavior

0	Abort, Stop will execute the MAS instruction immediately
1	Abort, Stop will wait for Inp_MasterNoMotion before executing MAS instruction

When Sts\_NoMotion of the axis is detected and either a Cmd\_Abort or Cmd\_Stop command is set, either the Sts\_AbortDone or Sts\_StopDone status bit, as appropriate, will be set.

#### Sts\_NoMotion

???No motion??? is when none of the motion planner inputs (for example, gears, jogs, or CAMs) are active and the axis speed is less than the level configured in Cfg\_ZeroSpeedTolerance.

The motion planner inputs are masked with the MotionStatus (Motion planner input) set this way:

65407 [dec] = 1111 1111 0111 1111 [bin]

Bit	Description
00	AccelStatus
01	DecelStatus
02	MoveStatus
03	JogStatus
04	GearingStatus
05	HomingStatus
06	StoppingStatus
07	AxisHomedStatus
08	PositionCamStatus
09	TimeCamStatus
10	PositionCamPendingStatus
11	TimeCamPendingStatus
12	GearingLockStatus
13	PositionCamLockStatus
14	MasterOffsetMoveStatus
15	CoordinatedMotionStatus

#### Sts\_Err - Error Codes

- 1 - MSO Instruction Execution Error
- 2 - MSO Instruction Execution Watchdog Timeout
- 3 - MSF Instruction Execution Error
- 4 - MSF Instruction Execution Watchdog Timeout
- 5 - MASR Instruction Execution Error
- 6 - MAFR Instruction Execution Error
- 7 - MAH Instruction Execution Error
- 8 - MAS Instruction Execution Error

---

#### General Information - Parameter Prefixing:

##### Inp\_

-----

##### Input:

Generally used to designate a connection to a real I/O input point or an upstream block.

##### Set\_

-----

##### Setpoint:

Used as a setpoint coming into the instruction. May come from the operator via the HMI, or from the controller program itself.

##### Cmd\_

-----

##### Command:

Generally used to as a command input either from the operator via the HMI or from the program.

##### Cfg\_

-----

##### Configuration:

Generally used to designate a configuration value.

Typically, but not always, something that is only changed irregularly.

##### Par\_

-----

##### Parameter:

Equipment parameter or input parameter from Batching systems.

Generally used to designate a value that receives changes on a regular basis.

##### Wrk\_

-----

##### Working Register:

In many cases the control routine will require some internal working storage locations. This is targeted at the control routine that lies inside a normal UDT. In the case of AOI's, these registers can simply become "Local Tags".

Out\_

-----

Output:  
Generally used to designate a connection to a real I/O output point or a downstream block.

Val\_

-----

Value:  
Designates a value calculated inside the instruction, which may or may not be the primary output of the instruction.

Rpt\_

-----

Report:  
Designates a value calculated inside the instruction that is typically used for batch reporting.

Sts\_

-----

Status:  
Status of the instruction. Also contains two required members.  
Ex.  
Sts\_Alarm - An alarm exists. (Boolean)  
Sts\_ER - The instruction itself has an error. (Boolean)

Alm\_

-----

Alarm:  
Alarm indicators to display which actual alarm is occurring. All of these are Booleans.

Rdy\_

-----

Ready:  
Command ready bits. Booleans determined inside the control routines to reflect whether the routine will allow state change commands. Used with the HMI faceplates to enable or disable command buttons.

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**Execution**

**Condition      Description**

EnableIn is true

Prescan

### Revision v1.13 Notes

- 1.12 - Correct repeated output and AFI warnings
- 1.11 - Fix rung 2 to use DriveEnableStatus. Fix rung 4 to zero Sts\_Err only on positive transition
- 1.10 - Fix homing to work with Kinetix 350
- 1.9 - Fix Device Comm Error anom.
- 1.8 - PosErr reset, add inhibit conditions to ER
- 1.7 - Add watchdog for fault reset
- 1.6 - Change Error annunciation for instruction faults
- 1.5 - Add notification for Inhibit Conditions
- 1.4 - v20 Update

Name	Default	Data Type	Scope
<b>Cfg_AbortEnabled</b>	1	BOOL	Axis_ObjectCD
Configuration: =1: CMD_Abort will execute MAS instruction = 0 no stop instruction executed			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_AbortEnabled - Axis_ObjectCD/Logic - 10(XIC), 11(XIC)</i>			
<b>Cfg_AbortRamp</b>	100.0	REAL	Axis_ObjectCD
Ramp for MAS instruction in aborting			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_AbortRamp - Axis_ObjectCD/Logic - 10(MOVE)</i>			
<b>Cfg_HMIFPDisplay</b>	0	DINT	Axis_ObjectCD
HMI Display tag used with HMI Global Object			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_HMIFPDisplay - Axis_ObjectCD/Logic - *20(MOVE)</i>			
<b>Cfg_HomeEnabled</b>	1	BOOL	Axis_ObjectCD
Configuration: =1: CMD_Home will execute MAH instruction = 0 no home instruction executed			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_HomeEnabled - Axis_ObjectCD/Logic - 6(XIC), 9(XIC)</i>			
<b>Cfg_StopEnabled</b>	1	BOOL	Axis_ObjectCD
Configuration: =1: CMD_Stop will execute MAS instruction = 0 no stop instruction executed			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_StopEnabled - Axis_ObjectCD/Logic - 10(XIC), 11(XIC)</i>			
<b>Cfg_StopRamp</b>	20.0	REAL	Axis_ObjectCD
Ramp for MAS instruction in stopping			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_StopRamp - Axis_ObjectCD/Logic - 10(MOVE)</i>			
<b>Cfg_UseVirtualMaster</b>	1	BOOL	Axis_ObjectCD
Configuration: =1: Abort, Stop will wait for Inp_MasterNoMotion before executing MAS instruction			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_UseVirtualMaster - Axis_ObjectCD/Logic - 10(XIO)</i>			

<b>Cfg_ZeroSpeedTolerance</b>	0.1	REAL	Axis_ObjectCD
Zero Speed Tolerance Window in units/sec for Sts_NoMotion			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_ZeroSpeedTolerance - Axis_ObjectCD/Logic - 13(LE)</i>			
<b>Cmd_Abort</b>	0	BOOL	Axis_ObjectCD
Stops the axis with AbortRamp Waits for Inp_MasterNoMotion if CfgUseVirtualMaster=1			
Usage:	Input Parameter		
Required:	Yes		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cmd_Abort - Axis_ObjectCD/Logic - 10(XIC), 11(XIC)</i>			
<b>Cmd_Disable</b>	0	BOOL	Axis_ObjectCD
Disables the Axis			
Usage:	Input Parameter		
Required:	Yes		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cmd_Disable - Axis_ObjectCD/Logic - 2(XIO), 3(XIC)</i>			
<b>Cmd_Enable</b>	0	BOOL	Axis_ObjectCD
Enables the Axis			
Usage:	Input Parameter		
Required:	Yes		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cmd_Enable - Axis_ObjectCD/Logic - 2(XIC)</i>			
<b>Cmd_FaultReset</b>	0	BOOL	Axis_ObjectCD
Fault Reset			
Usage:	Input Parameter		
Required:	Yes		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cmd_FaultReset - Axis_ObjectCD/Logic - 4(XIC), 5(XIC), 5(XIO)</i>			
<b>Cmd_Home</b>	0	BOOL	Axis_ObjectCD
Home the Axis, if Cfg_HomeEnabled = 1			
Usage:	Input Parameter		
Required:	Yes		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cmd_Home - Axis_ObjectCD/Logic - 6(XIC), 9(XIC)</i>			
<b>Cmd_Stop</b>	0	BOOL	Axis_ObjectCD
Stops the axis with StopRamp Waits for Inp_MasterNoMotion if CfgUseVirtualMaster=1			
Usage:	Input Parameter		
Required:	Yes		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cmd_Stop - Axis_ObjectCD/Logic - 10(XIC), 11(XIC)</i>			

<b>Err_DeviceCommunication</b>	0	BOOL	Axis_ObjectCD
Any General Fault			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_DeviceCommunication - Axis_ObjectCD/Logic - *18(OTL), *18(OTL), *4(OTU)</i>			
<i>Err_DeviceCommunication - Axis_ObjectCD/Prescan - *4(OTU)</i>			
<b>Err_FeedbackFault</b>	0	BOOL	Axis_ObjectCD
Any Feedback Fault including Aux Feedback			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_FeedbackFault - Axis_ObjectCD/Logic - *18(OTL), *4(OTU)</i>			
<i>Err_FeedbackFault - Axis_ObjectCD/Prescan - *4(OTU)</i>			
<b>Err_GuardFault</b>	0	BOOL	Axis_ObjectCD
Any Guard Fault (Safety Fault)			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_GuardFault - Axis_ObjectCD/Logic - *18(OTL), *18(OTL), *4(OTU)</i>			
<i>Err_GuardFault - Axis_ObjectCD/Prescan - *4(OTU)</i>			
<b>Err_InstructionFault</b>	0	BOOL	Axis_ObjectCD
Any instruction within the AOI faulted			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_InstructionFault - Axis_ObjectCD/Logic - *17(OTL), *17(OTU), *4(OTU)</i>			
<i>Err_InstructionFault - Axis_ObjectCD/Prescan - *4(OTU)</i>			
<b>Err_MI_Err</b>	0	DINT	Axis_ObjectCD
Motion instruction .ERR field if fault			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_MI_Err - Axis_ObjectCD/Logic - *10(MOVE), *2(MOVE), *3(MOVE), *4(MOVE), *4(MOVE), *4(MOVE), *7(MOVE)</i>			
<i>Err_MI_Err - Axis_ObjectCD/Prescan - *3(MOVE)</i>			
<b>Err_MI_ExErr</b>	0	DINT	Axis_ObjectCD
Motion instruction .EXERR field if fault			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_MI_ExErr - Axis_ObjectCD/Logic - *10(MOVE), *2(MOVE), *3(MOVE), *4(MOVE), *4(MOVE), *4(MOVE), *7(MOVE)</i>			
<i>Err_MI_ExErr - Axis_ObjectCD/Prescan - *3(MOVE)</i>			
<b>Err_NegOvertravel</b>	0	BOOL	Axis_ObjectCD
Any neagtive Overtravel Fault			
Usage:	Output Parameter		

<b>Err_NegOvertravel (Continued)</b>			
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_NegOvertravel - Axis_ObjectCD/Logic - *18(OTL), *4(OTU)</i>			
<i>Err_NegOvertravel - Axis_ObjectCD/Prescan - *4(OTU)</i>			
<b>Err_PositionError</b>	0	BOOL	Axis_ObjectCD
Position Error window exceeded			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_PositionError - Axis_ObjectCD/Logic - *18(OTL)</i>			
<b>Err_PosOvertravel</b>	0	BOOL	Axis_ObjectCD
Any positive Overtravel Fault			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_PosOvertravel - Axis_ObjectCD/Logic - *18(OTL), *4(OTU)</i>			
<i>Err_PosOvertravel - Axis_ObjectCD/Prescan - *4(OTU)</i>			
<b>Err_PowerFault</b>	0	BOOL	Axis_ObjectCD
Any Overload/Voltage Fault			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_PowerFault - Axis_ObjectCD/Logic - *18(OTL), *4(OTU)</i>			
<i>Err_PowerFault - Axis_ObjectCD/Prescan - *4(OTU)</i>			
<b>Err_TemperatureFault</b>	0	BOOL	Axis_ObjectCD
Any Temperature Fault			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Err_TemperatureFault - Axis_ObjectCD/Logic - *18(OTL), *4(OTU)</i>			
<i>Err_TemperatureFault - Axis_ObjectCD/Prescan - *4(OTU)</i>			
<b>Inp_MasterNoMotion</b>	0	BOOL	Axis_ObjectCD
If Cfg_UseVirtualMaster=1: Abort, Stop will wait for Inp_MasterNoMotion before executing MAS instruction			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Inp_MasterNoMotion - Axis_ObjectCD/Logic - 10(XIC)</i>			
<b>Inp_MotionGroup</b>		MOTION_GROUP	Axis_ObjectCD
Motion Group			
Usage:	InOut Parameter		
Required:	Yes		
Visible:	Yes		
OPC UA Access:	None		
<b>Inp_MotionGroup.GroupStatus</b>	??	DINT	

<b>Inp_MotionGroup (Continued)</b>			
Motion Group			
<b>Inp_MotionGroup.GroupStatus.1</b>	??	BOOL	
Motion Group			
<b>Inp_MotionGroup.InhibStatus</b>	??	BOOL	
Motion Group			
<b>Inp_MotionGroup.GroupSynced</b>	??	BOOL	
Motion Group			
<i>Inp_MotionGroup.GroupSynced - Axis_ObjectCD/Logic - 19(XIC)</i>			
<b>Inp_MotionGroup.AxisInhibitStatus</b>	??	BOOL	
Motion Group			
<b>Inp_MotionGroup.AxisTestModeStatus</b>	??	BOOL	
Motion Group			
<b>Inp_MotionGroup.GroupFault</b>	??	DINT	
Motion Group			
<b>Inp_MotionGroup.GroupOverlapFault</b>	??	BOOL	
Motion Group			
<b>Inp_MotionGroup.CSTLossFault</b>	??	BOOL	
Motion Group			
<b>Inp_MotionGroup.GroupTaskLoadingFault</b>	??	BOOL	
Motion Group			
<b>Inp_MotionGroup.ClockSyncFault</b>	??	BOOL	
Motion Group			
<b>Inp_MotionGroup.GroupAlarm</b>	??	DINT	
Motion Group			
<b>Inp_MotionGroup.ClockSyncAlarm</b>	??	BOOL	
Motion Group			
<b>Inp_MotionGroup.AxisFault</b>	??	DINT	
Motion Group			
<b>Inp_MotionGroup.PhysicalAxisFault</b>	??	BOOL	
Motion Group			
<b>Inp_MotionGroup.ModuleFault</b>	??	BOOL	
Motion Group			
<b>Inp_MotionGroup.ConfigFault</b>	??	BOOL	
Motion Group			
<b>Inp_MotionGroup.TaskMaxScanTime</b>	??	DINT	
Motion Group			
<b>Inp_MotionGroup.TaskLastScanTime</b>	??	DINT	
Motion Group			
<b>Inp_MotionGroup.TaskLastIOTime</b>	??	DINT	
Motion Group			
<b>Inp_MotionGroup.TaskMaxIOTime</b>	??	DINT	
Motion Group			
<b>Inp_MotionGroup.TaskAverageScanTime</b>	??	DINT	
Motion Group			
<b>Inp_MotionGroup.TaskAverageIOTime</b>	??	DINT	
Motion Group			
<b>Out_AxisCipState</b>	0	DINT	Axis_ObjectCD
CipState			
Usage:	Output Parameter		

**Out\_AxisCipState (Continued)**

Required: No  
 Visible: No  
 External Access: Read Only  
 OPC UA Access: None  
*Out\_AxisCipState - Axis\_ObjectCD/Logic - \*1(MOVE), 16(EQ)*

**Ref\_Axis\_CD**

AXIS\_CIP\_DRIVE

Axis\_ObjectCD

Servo Axis, Data type Axis CIP Drive

Usage: InOut Parameter

Required: Yes

Visible: Yes

OPC UA Access: None

*Ref\_Axis\_CD - Axis\_ObjectCD/Logic - 10(MAS), 2(MSO), 3(MSF), 4(MAFR), 4(MASR), 7(MAH)***Ref\_Axis\_CD.AxisFault** ??

DINT

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.AxisFault.1** ??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.AxisFault.5** ??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.AxisFault.6** ??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.AxisFault.7** ??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.PhysicalAxisFault** ??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.ModuleFault** ??

BOOL

Servo Axis, Data type Axis CIP Drive

*Ref\_Axis\_CD.ModuleFault - Axis\_ObjectCD/Logic - 19(XIO)***Ref\_Axis\_CD.ConfigFault** ??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.GroupFault** ??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.MotionFault** ??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.GuardFault** ??

BOOL

Servo Axis, Data type Axis CIP Drive

*Ref\_Axis\_CD.GuardFault - Axis\_ObjectCD/Logic - 18(XIC)***Ref\_Axis\_CD.InitializationFault** ??

BOOL

Servo Axis, Data type Axis CIP Drive

*Ref\_Axis\_CD.InitializationFault - Axis\_ObjectCD/Logic - 19(XIO)***Ref\_Axis\_CD.APRFault** ??

BOOL

Servo Axis, Data type Axis CIP Drive

*Ref\_Axis\_CD.APRFault - Axis\_ObjectCD/Logic - 14(XIO)***Ref\_Axis\_CD.SafetyFault** ??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.AxisStatus** ??

DINT

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.AxisStatus.1** ??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.AxisStatus.2** ??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.ServoActionStatus** ??

BOOL

Servo Axis, Data type Axis CIP Drive

*Ref\_Axis\_CD.ServoActionStatus - Axis\_ObjectCD/Logic - 2(XIC), 2(XIO), 2(XIO), 3(XIO)***Ref\_Axis\_CD.DriveEnableStatus** ??

BOOL

Servo Axis, Data type Axis CIP Drive

*Ref\_Axis\_CD.DriveEnableStatus - Axis\_ObjectCD/Logic - 2(XIC), 2(XIO), 2(XIO), 3(XIC)***Ref\_Axis\_CD.ShutdownStatus** ??

BOOL

Servo Axis, Data type Axis CIP Drive

*Ref\_Axis\_CD.ShutdownStatus - Axis\_ObjectCD/Logic - 19(XIO)***Ref\_Axis\_CD.ConfigUpdateInProgress**

??

BOOL

**Ref\_Axis\_CD (Continued)**

Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.InhibitStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DirectControlStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AxisUpdateStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotionStatus</b> ??	DINT
Servo Axis, Data type Axis CIP Drive	
<i>Ref_Axis_CD.MotionStatus - Axis_ObjectCD/Logic - 13(MEQ)</i>	
<b>Ref_Axis_CD.AccelStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DecelStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MoveStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.JogStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GearingStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.HomingStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.StoppingStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AxisHomedStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionCamStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TimeCamStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionCamPendingStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TimeCamPendingStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GearingLockStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionCamLockStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TimeCamLockStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MasterOffsetMoveStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CoordinatedMotionStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TransformStateStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ControlledByTransformStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DirectVelocityControlStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DirectTorqueControlStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	

<b>Ref_Axis_CD (Continued)</b>		
<b>Ref_Axis_CD.MoveLockStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.JogLockStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MasterOffsetMoveLockStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MaximumSpeedExceeded</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MotionAlarmStatus</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SoftTravelLimitPositiveAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SoftTravelLimitNegativeAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MotionFaultStatus</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MotionFaultStatus.1</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MotionFaultStatus.2</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SoftTravelLimitPositiveFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.SoftTravelLimitPositiveFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.SoftTravelLimitNegativeFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.SoftTravelLimitNegativeFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.AxisEvent</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.WatchEventArmedStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.WatchEventStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.RegEvent1ArmedStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.RegEvent1Status</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.RegEvent2ArmedStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.RegEvent2Status</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.HomeEventArmedStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.HomeEventStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.OutputCamStatus</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.OutputCamPendingStatus</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.OutputCamLockStatus</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		

<b>Ref_Axis_CD (Continued)</b>	
<b>Ref_Axis_CD.OutputCamTransitionStatus</b>	
??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ActualPosition</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.StrobeActualPosition</b>	
??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.StartActualPosition</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AverageVelocity</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<i>Ref_Axis_CD.AverageVelocity - Axis_ObjectCD/Logic - 13(ABS)</i>	
<b>Ref_Axis_CD.ActualVelocity</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ActualAcceleration</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.WatchPosition</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration1Position</b>	
??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration1PositiveEdgePosition</b>	
??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration1NegativeEdgePosition</b>	
??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration2Position</b>	
??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration2PositiveEdgePosition</b>	
??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration2NegativeEdgePosition</b>	
??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration1Time</b>	DINT
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration1PositiveEdgeTime</b>	
??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration1NegativeEdgeTime</b>	
??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration2Time</b>	DINT
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration2PositiveEdgeTime</b>	
??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration2NegativeEdgeTime</b>	
??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.InterpolationTime</b>	DINT
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.InterpolatedActualPosition</b>	
??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.InterpolatedCommandPosition</b>	
??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MasterOffset</b>	REAL
??	

**Ref\_Axis\_CD (Continued)**

Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.StrobeMasterOffset</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.StartMasterOffset</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CommandPosition</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.StrobeCommandPosition</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.StartCommandPosition</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DirectCommandVelocity</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CommandVelocity</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CommandAcceleration</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CommandTorque</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ModuleFaults</b> ??	DINT
Servo Axis, Data type Axis CIP Drive	
<i>Ref_Axis_CD.ModuleFaults - Axis_ObjectCD/Logic - 16(NE), 18(NE)</i>	
<b>Ref_Axis_CD.ControlSyncFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ModuleSyncFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TimerEventFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ModuleHardwareFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ModuleConnFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ConnFormatFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.LocalModeFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CPUWatchdogFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ClockJitterFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CyclicReadFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CyclicWriteFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ClockSkewFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ControlConnFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ClockSyncFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.LogicWatchdogFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DuplicateAddressFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SystemConnectionFault</b> ??	BOOL

**Ref\_Axis\_CD (Continued)**

Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ModuleAlarmStatus</b> ??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ControlSyncAlarm</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ModuleSyncAlarm</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TimerEventAlarm</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CPUOverloadAlarm</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ClockJitterAlarm</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.OutOfRangeAlarm</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ClockSkewAlarm</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ClockSyncAlarm</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.NodeAddressAlarm</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AttributeErrorCode</b> ??	INT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AttributeErrorID</b> ??	INT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionFineCommand</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionReference</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionFeedback1</b> ??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionFeedback2</b> ??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionError</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionIntegratorOutput</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionLoopOutput</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityFineCommand</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityFeedforwardCommand</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityReference</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityFeedback</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityFeedback1</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityFeedback2</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityError</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityIntegratorOutput</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityLoopOutput</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	

<b>Ref_Axis_CD (Continued)</b>	
<b>Ref_Axis_CD.VelocityLimitSource</b> ?? Servo Axis, Data type Axis CIP Drive	DINT
<b>Ref_Axis_CD.AccelerationFineCommand</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.AccelerationFeedforwardCommand</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.AccelerationReference</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.AccelerationFeedback</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.LoadObserverAccelerationEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.LoadObserverTorqueEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueReference</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueReferenceFiltered</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueReferenceLimited</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueNotchFilterFrequencyEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueNotchFilterMagnitudeEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueNotchFilterWidthEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueNotchFilter2FrequencyEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueNotchFilter2MagnitudeEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueNotchFilter2WidthEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueNotchFilter3FrequencyEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueNotchFilter3MagnitudeEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueNotchFilter3WidthEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueNotchFilter4FrequencyEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL
<b>Ref_Axis_CD.TorqueNotchFilter4MagnitudeEstimate</b> ?? Servo Axis, Data type Axis CIP Drive	REAL

**Ref\_Axis\_CD (Continued)**

Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TorqueNotchFilter4WidthEstimate</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TorqueLowPassFilterBandwidthEstimate</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AdaptiveTuningGainScalingFactor</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CurrentCommand</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CurrentReference</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CurrentError</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FluxCurrentReference</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FluxCurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FluxCurrentError</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.OperativeCurrentLimit</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CurrentLimitSource</b>	DINT
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorElectricalAngle</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SlipCompensation</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.OutputFrequency</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.OutputCurrent</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.OutputVoltage</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.OutputPower</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ConverterOutputCurrent</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ConverterOutputPower</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DCBusVoltage</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DCBusInputCurrent</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorCapacity</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.InverterCapacity</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ConverterCapacity</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusRegulatorCapacity</b>	REAL
??	

**Ref\_Axis\_CD (Continued)**

Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DigitalInputs</b> ??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AnalogInput1</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AnalogInput2</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineFrequency</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineCurrent</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineVoltage</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusVoltageReference</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusVoltageFeedback</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusVoltageError</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusObserverVoltageRateEstimate</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusObserverCurrentEstimate</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ActiveCurrentReference</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ActiveCurrentReferenceFiltered</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ActiveCurrentReferenceCompensated</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ReactiveCurrentReference</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ReactiveCurrentReferenceCompensated</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ActiveCurrentReferenceLimited</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ReactiveCurrentReferenceLimited</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ActiveCurrentFeedback</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ActiveCurrentError</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ReactiveCurrentFeedback</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ReactiveCurrentError</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ConverterOperativeCurrentLimit</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ConverterCurrentLimitSource</b> ??	DINT

**Ref\_Axis\_CD (Continued)**

Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineElectricalAngle</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackSectionCoil1CurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackSectionCoil2CurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackSectionCoil3CurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackSectionCoil4CurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackSectionCoil5CurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackSectionCoil6CurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackSectionCoil7CurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackSectionCoil8CurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackSectionCoil9CurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackSectionCoil10CurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackSectionCoil11CurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackSectionCoil12CurrentFeedback</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AccelerometerFeedbackDeviceX</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AccelerometerFeedbackDeviceY</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AccelerometerFeedbackDeviceZ</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AccelerometerFeedbackDeviceXRMS</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AccelerometerFeedbackDeviceYRMS</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AccelerometerFeedbackDeviceZRMS</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionTrim</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityTrim</b>	REAL
??	
Servo Axis, Data type Axis CIP Drive	

<b>Ref_Axis_CD (Continued)</b>	
<b>Ref_Axis_CD.AccelerationTrim</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TorqueTrim</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityFeedforwardGain</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AccelerationFeedforwardGain</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionLoopBandwidth</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionIntegratorBandwidth</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityLoopBandwidth</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityIntegratorBandwidth</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.LoadObserverBandwidth</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.LoadObserverIntegratorBandwidth</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TorqueLimitPositive</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TorqueLimitNegative</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityLowPassFilterBandwidth</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TorqueLowPassFilterBandwidth</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SystemInertia</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CurrentDisturbance</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DigitalOutputs</b> ??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AnalogOutput1</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AnalogOutput2</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusVoltageSetPoint</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ActiveCurrentTrim</b> ??	REAL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardStatus</b> ??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardStatus.2</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardOKStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardConfigLockedStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	

<b>Ref_Axis_CD (Continued)</b>	
<b>Ref_Axis_CD.GuardGateDriveOutputStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<i>Ref_Axis_CD.GuardGateDriveOutputStatus - Axis_ObjectCD/Logic - 18(XIO)</i>	
<b>Ref_Axis_CD.GuardStopInputStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardStopRequestStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardStopInProgressStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardStopDecelStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardStopStandstillStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardStopOutputStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardLimitedSpeedInputStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardLimitedSpeedRequestStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardLimitedSpeedMonitorInProgressStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardLimitedSpeedOutputStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardMaxSpeedMonitorInProgressStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardMaxAccelMonitorInProgressStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardDirectionMonitorInProgressStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardDoorControlLockStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardDoorControlOutputStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardDoorMonitorInputStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardDoorMonitorInProgressStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardLockMonitorInputStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardEnablingSwitchInputStatus</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.GuardEnablingSwitchInProgressStatus</b>	

<b>Ref_Axis_CD (Continued)</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardResetInputStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardResetRequiredStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardStopInputCycleRequiredStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardFaults</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardInternalFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardConfigurationFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardGateDriveFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardResetFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardFeedback1Fault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardFeedback2Fault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardFeedbackSpeedCompareFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardFeedbackPositionCompareFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardStopInputFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardStopOutputFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardStopDecelFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardStopStandstillFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardStopMotionFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardLimitedSpeedInputFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardLimitedSpeedOutputFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardLimitedSpeedMonitorFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardMaxSpeedMonitorFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		

Ref_Axis_CD (Continued)		
<b>Ref_Axis_CD.GuardMaxAccelMonitorFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardDirectionMonitorFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardDoorMonitorInputFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardDoorMonitorFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardDoorControlOutputFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardLockMonitorInputFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardLockMonitorFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardEnablingSwitchMonitorInputFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardEnablingSwitchMonitorFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardFeedback1VoltageMonitorFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.GuardFeedback2VoltageMonitorFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.CIPAxisState</b>	??	INT
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.CIPAxisState - Axis_ObjectCD/Logic - 1(MOVE), 16(EQ), 16(LIMIT), 18(LIMIT), 2(EQ)</i>		
<b>Ref_Axis_CD.CIPAxisStatus</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.LocalControlStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.AlarmStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.DCBusUpStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.PowerStructureEnabledStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MotorFluxUpStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.TrackingCommandStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.PositionLockStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.VelocityLockStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.VelocityStandstillStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.VelocityThresholdStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		

<b>Ref_Axis_CD (Continued)</b>	
<b>Ref_Axis_CD.VelocityLimitStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AccelerationLimitStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DecelerationLimitStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TorqueThresholdStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TorqueLimitStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CurrentLimitStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ThermalLimitStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackIntegrityStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CIPShutdownStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.InProcessStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DCBusUnload</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACPowerLossStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositionControlModeStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VelocityControlModeStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TorqueControlModeStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CIPAxisStatus2</b> ??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotoringStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.RegeneratingStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.RideThruStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineSyncStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusVoltageLockStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ReactivePowerOnlyModeStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.VoltageControlModeStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PowerLossStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineVoltageSagStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLinePhaseLossStatus</b>	

<b>Ref_Axis_CD (Continued)</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineFrequencyChangeStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineSyncLossStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SinglePhaseStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusVoltageLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusVoltageRateLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ActiveCurrentRateLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ReactiveCurrentRateLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ReactivePowerLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ReactivePowerRateLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ActiveCurrentLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ReactiveCurrentLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MotoringPowerLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.RegenerativePowerLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterThermalLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.CIPAxisStatusRA</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.TorqueNotchFilterFrequencyDetectedStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.TorqueNotchFilterTuneUnsuccessfulStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.TorqueNotchFilterMultipleFreqStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.TorqueNotchFilterFreqBelowLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.TorqueNotchFilterFreqAboveLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.AdaptiveTuneGainStabilizationStatus</b>	??	BOOL

<b>Ref_Axis_CD (Continued)</b>	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TestModeStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CIPAxisStatus2RA</b> ??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CIPAxisIOStatus</b> ??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.EnableInputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.HomeInputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration1InputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Registration2InputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PositiveOvertravelInputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.NegativeOvertravelInputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.Feedback1ThermostatStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ResistiveBrakeOutputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MechanicalBrakeOutputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorThermostatInputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CIPAxisIOStatusRA</b> ??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.RegenerativePowerInputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusCapacitorInputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ShuntThermalSwitchInputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ContactorenableOutputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PreChargeInputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineContactorenableInputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.RegenerativePowerOutputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusConditionerModuleInputStatus</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ConverterInputStatus</b>	

<b>Ref_Axis_CD (Continued)</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterOutputStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.CIPAxisFaults</b>	??	LINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MotorOvercurrentFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MotorCommutationFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.MotorCommutationFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.MotorOverspeedFLFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MotorOverspeedULFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MotorOvertemperatureFLFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.MotorOvertemperatureFLFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.MotorOvertemperatureULFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MotorThermalOverloadFLFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.MotorThermalOverloadFLFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.MotorThermalOverloadULFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MotorPhaseLossFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.InverterOvercurrentFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.InverterOvercurrentFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.InverterOvertemperatureFLFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.InverterOvertemperatureFLFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.InverterOvertemperatureULFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.InverterThermalOverloadFLFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.InverterThermalOverloadFLFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.InverterThermalOverloadULFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterOvercurrentFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterGroundCurrentFLFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterGroundCurrentULFault</b>		

<b>Ref_Axis_CD (Continued)</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterOvertemperatureFLFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.ConverterOvertemperatureFLFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.ConverterOvertemperatureULFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterThermalOverloadFLFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.ConverterThermalOverloadFLFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.ConverterThermalOverloadULFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterACPowerLossFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterACSinglePhaseLossFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.ConverterACSinglePhaseLossFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.ConverterACPhaseShortFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterPreChargeFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusRegulatorOvertemperatureFLFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.BusRegulatorOvertemperatureFLFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.BusRegulatorOvertemperatureULFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusRegulatorThermalOverloadFLFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.BusRegulatorThermalOverloadFLFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.BusRegulatorThermalOverloadULFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusRegulatorFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusModuleFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusUndervoltageFLFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.BusUndervoltageFLFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.BusUndervoltageULFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusOvervoltageFLFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.BusOvervoltageFLFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.BusOvervoltageULFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusPowerLossFault</b>	??	BOOL

**Ref\_Axis\_CD (Continued)**

Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusPowerBlownFuseFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusPowerLeakageFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusPowerSharingFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackSignalNoiseFLFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackSignalNoiseULFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackSignalLossFLFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackSignalLossULFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackDataLossFLFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackDataLossULFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackDeviceFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<i>Ref_Axis_CD.FeedbackDeviceFault - Axis_ObjectCD/Logic - 18(XIC)</i>	
<b>Ref_Axis_CD.SensorFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BrakeSlipFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.HardwareOvertravelPositiveFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<i>Ref_Axis_CD.HardwareOvertravelPositiveFault - Axis_ObjectCD/Logic - 18(XIC)</i>	
<b>Ref_Axis_CD.HardwareOvertravelNegativeFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<i>Ref_Axis_CD.HardwareOvertravelNegativeFault - Axis_ObjectCD/Logic - 18(XIC)</i>	
<b>Ref_Axis_CD.ExcessivePositionErrorFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<i>Ref_Axis_CD.ExcessivePositionErrorFault - Axis_ObjectCD/Logic - 18(XIC)</i>	
<b>Ref_Axis_CD.ExcessiveVelocityErrorFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.OvertorqueLimitFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.UndertorqueLimitFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ExcessiveBusVoltageErrorFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AmbientTemperatureRiseFault</b>	
??	BOOL

**Ref\_Axis\_CD (Continued)**

Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.IllegalControlModeFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.EnableInputDeactivatedFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ControllerInitiatedFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ExternalInputFault</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CIPAxisFaults2</b>	??
??	LINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineOvervoltageFLFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineOvervoltageULFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineUndervoltageFLFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineUndervoltageULFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineHighFrequencyFLFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineHighFrequencyULFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineLowFrequencyFLFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineLowFrequencyULFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineVoltageUnbalanceFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineCurrentUnbalanceFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineVoltageSagFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineFrequencyChangeFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineSyncLossFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineSyncFailureFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.InverterGroundCurrentFLFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.InverterGroundCurrentULFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	

**Ref\_Axis\_CD (Continued)****Ref\_Axis\_CD.InverterOutputPhaseShortFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.AuxiliaryPowerSupplyFLFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.AuxiliaryPowerSupplyULFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.BusInputOvercurrentFLFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.BusInputOvercurrentULFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.CIPAxisFaultsRA**

??

LINT

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.CommutationStartupFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.MotorVoltageMismatchFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.FeedbackFilterNoiseFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.FeedbackBatteryLossFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.FeedbackBatteryLowFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.FeedbackIncrementalCountErrorFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.ControlModuleOvertemperatureFLFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.ControlModuleOvertemperatureULFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.ConverterPreChargeOverloadFLFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

*Ref\_Axis\_CD.ConverterPreChargeOverloadFLFault - Axis\_ObjectCD/Logic - 18(XIC)***Ref\_Axis\_CD.ConverterPreChargeOverloadULFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.ExcessiveCurrentFeedbackOffsetFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.RegenerativePowerSupplyFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.PWMFrequencyReducedFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.CurrentLimitReducedFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.TorqueProveFault**

??

BOOL

Servo Axis, Data type Axis CIP Drive

<b>Ref_Axis_CD (Continued)</b>	
<b>Ref_Axis_CD.DecelOverrideFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PreventativeMaintenanceFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorTestFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.HardwareConfigurationFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FirmwareChangeFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ConverterPreChargeInputDeactivatedFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DCCommonBusFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.RuntimeErrorFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BackplaneCommunicationErrorFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SafetyModuleCommunicationErrorFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineContactorFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineResonanceFLFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineResonanceULFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackStopFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.LostMoverAssociationFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.UnassociatedMoverFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralHardwareFLFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralHardwareULFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralOverTemperatureFLFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralOverTemperatureULFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralUnderTemperatureFLFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralUnderTemperatureULFault</b> ??	BOOL
Servo Axis, Data type Axis CIP Drive	

<b>Ref_Axis_CD (Continued)</b>	
<b>Ref_Axis_CD.PeripheralCommunicationFLFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralCommunicationULFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AdapterCommunicationFLFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AdapterCommunicationULFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ExcessiveMotorVoltageFeedbackOffsetFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLinePhaseReversalFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PhaseThermalImbalanceFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DCBusVoltageImbalanceFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PredictiveMaintenanceFault</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ProductSpecificFault</b>	??
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CIPAxisAlarms</b>	??
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorOvercurrentAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorCommutationAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorOverspeedFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorOverspeedULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorOvertemperatureFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorOvertemperatureULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorThermalOverloadFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorThermalOverloadULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorPhaseLossAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.InverterOvercurrentAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.InverterOvertemperatureFLAlarm</b>	

<b>Ref_Axis_CD (Continued)</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.InverterOvertemperatureULAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.InverterThermalOverloadFLAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.InverterThermalOverloadULAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterOvercurrentAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterGroundCurrentFLAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterGroundCurrentULAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterOvertemperatureFLAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterOvertemperatureULAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterThermalOverloadFLAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterThermalOverloadULAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterACPowerLossAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterACSinglePhaseLossAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterACPhaseShortAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterPreChargeAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusRegulatorOvertemperatureFLAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusRegulatorOvertemperatureULAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusRegulatorThermalOverloadFLAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusRegulatorThermalOverloadULAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusRegulatorAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusModuleAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusUndervoltageFLAlarm</b>	??	BOOL

<b>Ref_Axis_CD (Continued)</b>	
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusUndervoltageULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusOvervoltageFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusOvervoltageULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusPowerLossAlarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusPowerBlownFuseAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusPowerLeakageAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusPowerSharingAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackSignalNoiseFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackSignalNoiseULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackSignalLossFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackSignalLossULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackDataLossFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackDataLossULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackDeviceAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SensorAlarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BrakeSlipAlarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.HardwareOvertravelPositiveAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.HardwareOvertravelNegativeAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ExcessivePositionErrorAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ExcessiveVelocityErrorAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.OvertorqueLimitAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.UndertorqueLimitAlarm</b>	

<b>Ref_Axis_CD (Continued)</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ExcessiveBusVoltageErrorAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.AmbientTemperatureRiseAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.IllegalControlModeAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.EnableInputDeactivatedAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ControllerInitiatedAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ExternalInputAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.CIPAxisAlarms2</b>	??	LINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineOvervoltageFLAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineOvervoltageULAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineUndervoltageFLAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineUndervoltageULAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineHighFrequencyFLAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineHighFrequencyULAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineLowFrequencyFLAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineLowFrequencyULAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineVoltageUnbalanceAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineCurrentUnbalanceAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineVoltageSagAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineFrequencyChangeAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineSyncLossAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ACLineSyncFailureAlarm</b>	??	BOOL

**Ref\_Axis\_CD (Continued)**

Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.InverterGroundCurrentFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.InverterGroundCurrentULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.InverterOutputPhaseShortAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AuxiliaryPowerSupplyFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AuxiliaryPowerSupplyULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusInputOvercurrentFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.BusInputOvercurrentULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CIPAxisAlarmsRA</b>	??
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CommutationStartupAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorVoltageMismatchAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackFilterNoiseAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackBatteryLossAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackBatteryLowAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FeedbackIncrementalCountErrorAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ControlModuleOvertemperatureFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ControlModuleOvertemperatureULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ConverterPreChargeOverloadFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ConverterPreChargeOverloadULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ExcessiveCurrentFeedbackOffsetAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.RegenerativePowerSupplyAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PWMFrequencyReducedAlarm</b>	
??	BOOL

**Ref\_Axis\_CD (Continued)**

Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.CurrentLimitReducedAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TorqueProveAlarm</b>	??
Servo Axis, Data type Axis CIP Drive	BOOL
<b>Ref_Axis_CD.DecelOverrideAlarm</b>	??
Servo Axis, Data type Axis CIP Drive	BOOL
<b>Ref_Axis_CD.PreventativeMaintenanceAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.MotorTestAlarm</b>	??
Servo Axis, Data type Axis CIP Drive	BOOL
<b>Ref_Axis_CD.HardwareConfigurationAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.FirmwareChangeAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ConverterPreChargeInputDeactivatedAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DCCommonBusAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.RuntimeErrorAlarm</b>	??
Servo Axis, Data type Axis CIP Drive	BOOL
<b>Ref_Axis_CD.BackplaneCommunicationErrorAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SafetyModuleCommunicationErrorAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineContactorAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineResonanceFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLineResonanceULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.TrackStopAlarm</b>	??
Servo Axis, Data type Axis CIP Drive	BOOL
<b>Ref_Axis_CD.LostMoverAssociationAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.UnassociatedMoverAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralHardwareFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralHardwareULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralOverTemperatureFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralOverTemperatureULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	

<b>Ref_Axis_CD (Continued)</b>	
<b>Ref_Axis_CD.PeripheralUnderTemperatureFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralUnderTemperatureULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralCommunicationFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PeripheralCommunicationULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AdapterCommunicationFLAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AdapterCommunicationULAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ExcessiveMotorVoltageFeedbackOffsetAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ACLinePhaseReversalAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PhaseThermalImbalanceAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.DCBusVoltageImbalanceAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.PredictiveMaintenanceAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.ProductSpecificAlarm</b>	
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.AxisSafetyAlarms</b>	??
??	DINT
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SafetyCoreAlarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SafetyFeedbackAlarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SafeTorqueOffAlarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SS1Alarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SS2Alarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SOSAlarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SBCAlarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SMTAlarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SSMAlarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SLSAlarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	
<b>Ref_Axis_CD.SLAAlarm</b>	??
??	BOOL
Servo Axis, Data type Axis CIP Drive	

<b>Ref_Axis_CD (Continued)</b>		
<b>Ref_Axis_CD.SDIAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SCAAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SLPAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafetyValidatorAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafetyAbortAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.AxisSafetyAlarmsRA</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SFXAlarm</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.CIPInitializationFaults</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BootBlockChecksumFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MainBlockChecksumFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.NonvolatileMemoryChecksumFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.CIPInitializationFaultsRA</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.CIPInitializationFaultsRA.19</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.FeedbackDataCorruptionFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.FeedbackDataRangeFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.FeedbackCommunicationStartupFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.FeedbackAbsoluteOverspeedFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.FeedbackAbsolutePowerOffTravelFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.FeedbackAbsoluteStartupSpeedFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.CommutationOffsetUninitializedFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.InvalidFPGAImageFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.InvalidBoardSupportPackageFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.InvalidSafetyFirmwareFault</b>		

<b>Ref_Axis_CD (Continued)</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.PowerBoardFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.IllegalOptionCardFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.OptionStorageChecksumFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ModuleVoltageMismatchFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.ModuleVoltageMismatchFault - Axis_ObjectCD/Logic - 18(XIC)</i>		
<b>Ref_Axis_CD.UnknownModuleFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.FactoryConfigurationErrorFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.IllegalAddressFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SeriesMismatchFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.OpenSlotFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MoverAxisAssignmentFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.TrackBackplaneCommunicationFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.UnassociatedSectionAxisFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.TrackConfigurationFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.CIPStartInhibits</b>	??	INT
Servo Axis, Data type Axis CIP Drive		
<i>Ref_Axis_CD.CIPStartInhibits - Axis_ObjectCD/Logic - 15(NE)</i>		
<b>Ref_Axis_CD.AxisEnableInputInhibit</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MotorNotConfiguredInhibit</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.FeedbackNotConfiguredInhibit</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.CommutationNotConfigured</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafeTorqueOffActiveInhibit</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ConverterBusUnloadInhibit</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BusInputOvercurrentInhibit</b>	??	BOOL

**Ref\_Axis\_CD (Continued)**

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.InvalidSlipSpeedInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.CIPStartInhibitsRA** ??

INT

Servo Axis, Data type Axis CIP Drive

*Ref\_Axis\_CD.CIPStartInhibitsRA - Axis\_ObjectCD/Logic - 15(NE)***Ref\_Axis\_CD.VoltsHertzCurveDefinitionInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.MotorFeedbackRequiredInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.SpeedLimitConfigurationInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.TorqueProveConfigurationInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.SafeTorqueOffInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.SafetyResetRequiredInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.SafetyNotConfiguredInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.StopCommandActiveInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.FeedbackDeviceResetInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.BrakeMalfunctionInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.ACLineContactorInputInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.TrackSectionNotEnabledInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.TrackMoverMotorMismatchInhibit**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.AxisSafetyState** ??

INT

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.AxisSafetyDataA** ??

DINT

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.AxisSafetyDataB** ??

DINT

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.AxisSafetyStatus** ??

DINT

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.SafetyFaultStatus** ??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.SafetyResetRequestStatus**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD.SafetyResetRequiredStatus**

??

BOOL

Servo Axis, Data type Axis CIP Drive

**Ref\_Axis\_CD (Continued)**

<b>Ref_Axis_CD.SafeTorqueOffActiveStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafeTorqueDisabledStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SBCActiveStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SBCEngagedStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SS1ActiveStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SS2ActiveStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SOSActiveStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SOSStandstillStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SMTActiveStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SMTOvertemperatureStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SSMActiveStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SSMStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SLSActiveStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SLSLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SLAAActiveStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SLALimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SDIAActiveStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SDILimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafePositiveMotionStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafeNegativeMotionStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SCAAActiveStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SCAStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SLPActiveStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SLPLimitStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafetyOutputConnectionClosedStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafetyOutputConnectionIdleStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.AxisSafetyStatusRA</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafeBrakeIntegrityStatus</b>		

<b>Ref_Axis_CD (Continued)</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafeFeedbackHomedStatus</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.AxisSafetyFaults</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafetyCoreFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafetyFeedbackFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafeTorqueOffFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SS1Fault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SS2Fault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SOSFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SBCFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SMTFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SSMFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SLSFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SLAFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SDIFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SCAFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SLPFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafetyValidatorFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SafetyAbortFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.AxisSafetyFaultsRA</b>	??	DINT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.SFXFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.CIPAPRFaults</b>	??	INT
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MemoryWriteErrorAPRFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.MemoryReadErrorAPRFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.FeedbackSerialNumberMismatchAPRFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.BufferAllocationAPRFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.ScalingConfigurationChangedAPRFault</b>	??	BOOL
Servo Axis, Data type Axis CIP Drive		
<b>Ref_Axis_CD.FeedbackModeChangedAPRFault</b>	??	BOOL

<b>Ref_Axis_CD (Continued)</b>			
Servo Axis, Data type Axis CIP Drive			
<b>Ref_Axis_CD.FeedbackIntegrityLossAPRFault</b>	??	BOOL	
Servo Axis, Data type Axis CIP Drive			
<b>Ref_Axis_CD.FeedbackPositionRangeChangedAPRFault</b>	??	BOOL	
Servo Axis, Data type Axis CIP Drive			
<b>Ref_Axis_CD.CIPAPRFaultsRA</b>	??	INT	
Servo Axis, Data type Axis CIP Drive			
<b>Ref_Axis_CD.PersistentMediaAPRFault</b>	??	BOOL	
Servo Axis, Data type Axis CIP Drive			
<b>Ref_Axis_CD.FirmwareErrorAPRFault</b>	??	BOOL	
Servo Axis, Data type Axis CIP Drive			
<b>Ref_Axis_CD.FeedbackBatteryLossAPRFault</b>	??	BOOL	
Servo Axis, Data type Axis CIP Drive			
<b>Ref_Axis_CD.MoverSequencingWithoutReferenceAPRFault</b>	??	BOOL	
Servo Axis, Data type Axis CIP Drive			
<b>Ref_Axis_CD.MoverAssignmentSequenceChangedAPRFault</b>	??	BOOL	
Servo Axis, Data type Axis CIP Drive			
<b>Sts_AbortDone</b>	0	BOOL	Axis_ObjectCD
Condition: Aborting Done			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_AbortDone - Axis_ObjectCD/Logic - *11(OTE)</i>			
<b>Sts_AbsoluteReferenceStatus</b>	0	BOOL	Axis_ObjectCD
Absolute Feedback device shows Reference Ok			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_AbsoluteReferenceStatus - Axis_ObjectCD/Logic - *14(OTE)</i>			
<b>Sts_AxisOk</b>	0	BOOL	Axis_ObjectCD
Status Display: Axis ready to enable			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_AxisOk - Axis_ObjectCD/Logic - *19(OTE)</i>			
<b>Sts_CIP_StartInhibitActive</b>	0	BOOL	Axis_ObjectCD
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_CIP_StartInhibitActive - Axis_ObjectCD/Logic - *15(OTE), 16(XIC)</i>			
<b>Sts_DisableDone</b>	0	BOOL	Axis_ObjectCD
Condition: Disable Done			

**Sts\_DisableDone (Continued)**

Usage: Output Parameter  
 Required: No  
 Visible: Yes  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_DisableDone - Axis\_ObjectCD/Logic - \*3(OTE)*

**Sts\_EnableDone** 0 BOOL Axis\_ObjectCD

Condition: Enable Done  
 Usage: Output Parameter  
 Required: No  
 Visible: Yes  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_EnableDone - Axis\_ObjectCD/Logic - \*2(OTE)*

**Sts\_ER** 0 BOOL Axis\_ObjectCD

Any Fault occurred on this Axis  
 Usage: Output Parameter  
 Required: No  
 Visible: Yes  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_ER - Axis\_ObjectCD/Logic - \*16(OTE), 18(XIC), 19(XIO), 2(XIO), 20(XIC)*

**Sts\_Err** 0 DINT Axis\_ObjectCD

Usage: Output Parameter  
 Required: No  
 Visible: No  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_Err - Axis\_ObjectCD/Logic - \*10(MOVE), \*2(MOVE), \*2(MOVE), \*3(MOVE), \*3(MOVE), \*4(MOVE), \*4(MOVE), \*4(MOVE), \*7(MOVE), 16(NE), 17(EQ), 17(NE)*  
*Sts\_Err - Axis\_ObjectCD/Prescan - \*3(MOVE)*

**Sts\_FaultResetDone** 0 BOOL Axis\_ObjectCD

Condition: Fault Reset Done  
 Usage: Output Parameter  
 Required: No  
 Visible: Yes  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_FaultResetDone - Axis\_ObjectCD/Logic - \*5(OTL), \*5(OTU)*

**Sts\_Homed** 0 BOOL Axis\_ObjectCD

The Axis has been homed  
 Usage: Output Parameter  
 Required: No  
 Visible: Yes  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_Homed - Axis\_ObjectCD/Logic - \*6(OTU), \*8(OTL), 9(XIC)*  
*Sts\_Homed - Axis\_ObjectCD/Prescan - \*2(OTU)*

**Sts\_HomeDone** 0 BOOL Axis\_ObjectCD

Condition: Home Done  
 Usage: Output Parameter  
 Required: No  
 Visible: Yes  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_HomeDone - Axis\_ObjectCD/Logic - \*9(OTE)*

<b>Sts_NoMotion</b>	0	BOOL	Axis_ObjectCD
AverageVelocity within ZeroSpeedTolerance and no MotionStatus set			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_NoMotion - Axis_ObjectCD/Logic - *13(O TE), 11(XIC)</i>			
<b>Sts_StopDone</b>	0	BOOL	Axis_ObjectCD
Condition: Stopping Done			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_StopDone - Axis_ObjectCD/Logic - *11(O TE)</i>			

Name	Default	Data Type	Scope
<b>Wrk_DecelRate</b>	0.0	REAL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
<i>Wrk_DecelRate - Axis_ObjectCD/Logic - *10(MOVE), *10(MOVE), 10(MAS)</i>			
<b>Wrk_ER_ONS</b>	0	BOOL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
<i>Wrk_ER_ONS - Axis_ObjectCD/Logic - *20(ONS)</i>			
<b>Wrk_FaultReset_delay</b>		TIMER	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
<i>Wrk_FaultReset_delay - Axis_ObjectCD/Logic - *5(TON)</i>			
<b>Wrk_FaultReset_delay.DN</b>	0	BOOL	
<i>Wrk_FaultReset_delay.DN - Axis_ObjectCD/Logic - 5(XIC)</i>			
<b>Wrk_HomeSequence</b>	0	DINT	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
<i>Wrk_HomeSequence - Axis_ObjectCD/Logic - *6(MOVE), *7(MOVE), *8(MOVE), 7(EQ), 8(EQ)</i>			
<i>Wrk_HomeSequence - Axis_ObjectCD/Prescan - *2(MOVE)</i>			
<b>Wrk_MI_Disable</b>		MOTION_INSTRUCTION	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
<i>Wrk_MI_Disable - Axis_ObjectCD/Logic - *3(MSF)</i>			
<i>Wrk_MI_Disable - Axis_ObjectCD/Prescan - *1(COP)</i>			
<b>Wrk_MI_Disable.DN</b>	0	BOOL	
<i>Wrk_MI_Disable.DN - Axis_ObjectCD/Logic - 3(XIC)</i>			
<b>Wrk_MI_Disable.ER</b>	0	BOOL	
<i>Wrk_MI_Disable.ER - Axis_ObjectCD/Logic - 3(XIC), 3(XIC)</i>			
<b>Wrk_MI_Disable.ERR</b>	0	INT	
<i>Wrk_MI_Disable.ERR - Axis_ObjectCD/Logic - 3(MOVE)</i>			
<b>Wrk_MI_Disable.EXERR</b>	0	SINT	
<i>Wrk_MI_Disable.EXERR - Axis_ObjectCD/Logic - 3(MOVE)</i>			
<b>Wrk_MI_Enable</b>		MOTION_INSTRUCTION	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
<i>Wrk_MI_Enable - Axis_ObjectCD/Logic - *2(MSO)</i>			
<i>Wrk_MI_Enable - Axis_ObjectCD/Prescan - *1(COP)</i>			
<b>Wrk_MI_Enable.ER</b>	0	BOOL	
<i>Wrk_MI_Enable.ER - Axis_ObjectCD/Logic - 2(XIC)</i>			
<b>Wrk_MI_Enable.ERR</b>	0	INT	
<i>Wrk_MI_Enable.ERR - Axis_ObjectCD/Logic - 2(MOVE)</i>			
<b>Wrk_MI_Enable.EXERR</b>	0	SINT	
<i>Wrk_MI_Enable.EXERR - Axis_ObjectCD/Logic - 2(MOVE)</i>			
<b>Wrk_MI_FaultReset</b>		MOTION_INSTRUCTION	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
<i>Wrk_MI_FaultReset - Axis_ObjectCD/Logic - *4(MAFR)</i>			
<i>Wrk_MI_FaultReset - Axis_ObjectCD/Prescan - *1(COP)</i>			
<b>Wrk_MI_FaultReset.ER</b>	0	BOOL	

<b>Wrk_MI_FaultReset (Continued)</b>		
<i>Wrk_MI_FaultReset.ER - Axis_ObjectCD/Logic - 4(XIC)</i>		
<b>Wrk_MI_FaultReset.ERR</b>	0	INT
<i>Wrk_MI_FaultReset.ERR - Axis_ObjectCD/Logic - 4(MOVE)</i>		
<b>Wrk_MI_FaultReset.EXERR</b>	0	SINT
<i>Wrk_MI_FaultReset.EXERR - Axis_ObjectCD/Logic - 4(MOVE)</i>		
<b>Wrk_MI_Home</b>		MOTION_INSTRUCTION
Axis_ObjectCD		
Usage: Local Tag		
External Access: None		
OPC UA Access: None		
<i>Wrk_MI_Home - Axis_ObjectCD/Logic - *7(MAH)</i>		
<i>Wrk_MI_Home - Axis_ObjectCD/Prescan - *1(COP)</i>		
<b>Wrk_MI_Home.ER</b>	0	BOOL
<i>Wrk_MI_Home.ER - Axis_ObjectCD/Logic - 7(XIC)</i>		
<b>Wrk_MI_Home.PC</b>	0	BOOL
<i>Wrk_MI_Home.PC - Axis_ObjectCD/Logic - 8(XIC)</i>		
<b>Wrk_MI_Home.ERR</b>	0	INT
<i>Wrk_MI_Home.ERR - Axis_ObjectCD/Logic - 7(MOVE)</i>		
<b>Wrk_MI_Home.EXERR</b>	0	SINT
<i>Wrk_MI_Home.EXERR - Axis_ObjectCD/Logic - 7(MOVE)</i>		
<b>Wrk_MI_Init</b>		MOTION_INSTRUCTION
Axis_ObjectCD		
Usage: Local Tag		
External Access: None		
OPC UA Access: None		
<i>Wrk_MI_Init - Axis_ObjectCD/Prescan - 1(COP), 1(COP), 1(COP), 1(COP), 1(COP), 1(COP)</i>		
<b>Wrk_MI_Init.FLAGS</b>	0	DINT
<i>Wrk_MI_Init.FLAGS - Axis_ObjectCD/Prescan - *1(MOVE)</i>		
<b>Wrk_MI_Init.ERR</b>	0	INT
<i>Wrk_MI_Init.ERR - Axis_ObjectCD/Prescan - *1(MOVE)</i>		
<b>Wrk_MI_Init.STATUS</b>	0	SINT
<i>Wrk_MI_Init.STATUS - Axis_ObjectCD/Prescan - *1(MOVE)</i>		
<b>Wrk_MI_Init.STATE</b>	0	SINT
<i>Wrk_MI_Init.STATE - Axis_ObjectCD/Prescan - *1(MOVE)</i>		
<b>Wrk_MI_Init.SEGMENT</b>	0	DINT
<i>Wrk_MI_Init.SEGMENT - Axis_ObjectCD/Prescan - *1(MOVE)</i>		
<b>Wrk_MI_Init.EXERR</b>	0	SINT
<i>Wrk_MI_Init.EXERR - Axis_ObjectCD/Prescan - *1(MOVE)</i>		
<b>Wrk_MI_ShutdownReset</b>		MOTION_INSTRUCTION
Axis_ObjectCD		
Usage: Local Tag		
External Access: None		
OPC UA Access: None		
<i>Wrk_MI_ShutdownReset - Axis_ObjectCD/Logic - *4(MASR)</i>		
<i>Wrk_MI_ShutdownReset - Axis_ObjectCD/Prescan - *1(COP)</i>		
<b>Wrk_MI_ShutdownReset.ER</b>	0	BOOL
<i>Wrk_MI_ShutdownReset.ER - Axis_ObjectCD/Logic - 4(XIC)</i>		
<b>Wrk_MI_ShutdownReset.ERR</b>	0	INT
<i>Wrk_MI_ShutdownReset.ERR - Axis_ObjectCD/Logic - 4(MOVE)</i>		
<b>Wrk_MI_ShutdownReset.EXERR</b>	0	SINT
<i>Wrk_MI_ShutdownReset.EXERR - Axis_ObjectCD/Logic - 4(MOVE)</i>		
<b>Wrk_MI_Stop</b>		MOTION_INSTRUCTION
Axis_ObjectCD		
Usage: Local Tag		
External Access: None		
OPC UA Access: None		
<i>Wrk_MI_Stop - Axis_ObjectCD/Logic - *10(MAS)</i>		
<i>Wrk_MI_Stop - Axis_ObjectCD/Prescan - *1(COP)</i>		
<b>Wrk_MI_Stop.ER</b>	0	BOOL
<i>Wrk_MI_Stop.ER - Axis_ObjectCD/Logic - 10(XIC)</i>		
<b>Wrk_MI_Stop.ERR</b>	0	INT
<i>Wrk_MI_Stop.ERR - Axis_ObjectCD/Logic - 10(MOVE)</i>		

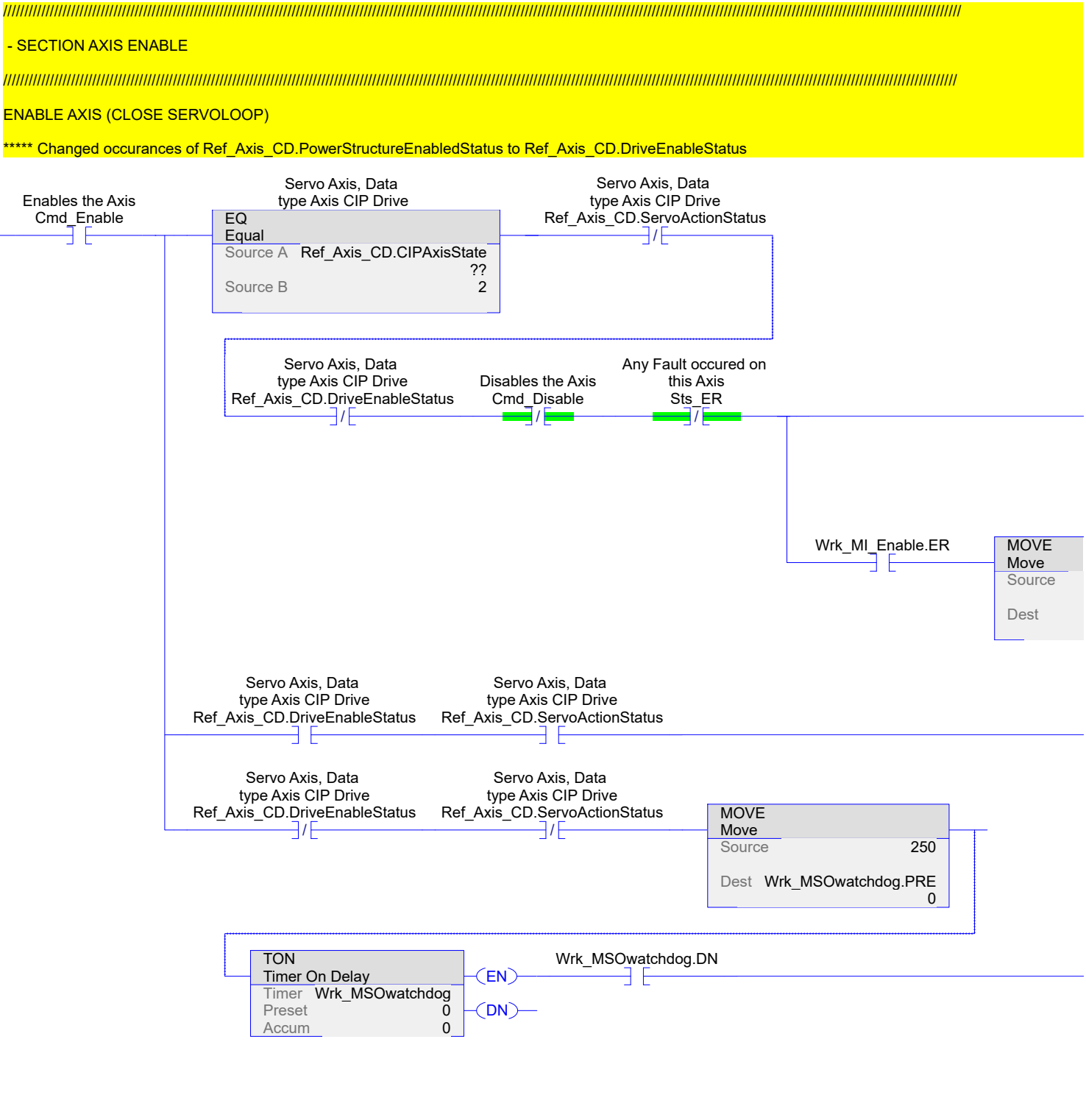
<b>Wrk_MI_Stop (Continued)</b>			
<b>Wrk_MI_Stop.EXERR</b>	0	SINT	
<i>Wrk_MI_Stop.EXERR - Axis_ObjectCD/Logic - 10(MOVE)</i>			
<b>Wrk_MSFWatchdog</b>		TIMER	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
<i>Wrk_MSFWatchdog - Axis_ObjectCD/Logic - *3(TON)</i>			
<b>Wrk_MSFWatchdog.PRE</b>	0	DINT	
<i>Wrk_MSFWatchdog.PRE - Axis_ObjectCD/Logic - *3(MOVE)</i>			
<b>Wrk_MSFWatchdog.DN</b>	0	BOOL	
<i>Wrk_MSFWatchdog.DN - Axis_ObjectCD/Logic - 3(XIC)</i>			
<b>Wrk_MSOwatchdog</b>		TIMER	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
<i>Wrk_MSOwatchdog - Axis_ObjectCD/Logic - *2(TON)</i>			
<b>Wrk_MSOwatchdog.PRE</b>	0	DINT	
<i>Wrk_MSOwatchdog.PRE - Axis_ObjectCD/Logic - *2(MOVE)</i>			
<b>Wrk_MSOwatchdog.DN</b>	0	BOOL	
<i>Wrk_MSOwatchdog.DN - Axis_ObjectCD/Logic - 2(XIC)</i>			
<b>Wrk_ONS_HomeStart</b>	0	BOOL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
<i>Wrk_ONS_HomeStart - Axis_ObjectCD/Logic - *6(ONS)</i>			
<i>Wrk_ONS_HomeStart - Axis_ObjectCD/Prescan - *2(OTU)</i>			
<b>Wrk_ONS_Init</b>	0	BOOL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
<i>Wrk_ONS_Init - Axis_ObjectCD/Logic - *4(ONS)</i>			
<b>Wrk_Velocity</b>	0.0	REAL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Wrk_Velocity - Axis_ObjectCD/Logic - *13(ABS), 13(LE)</i>			

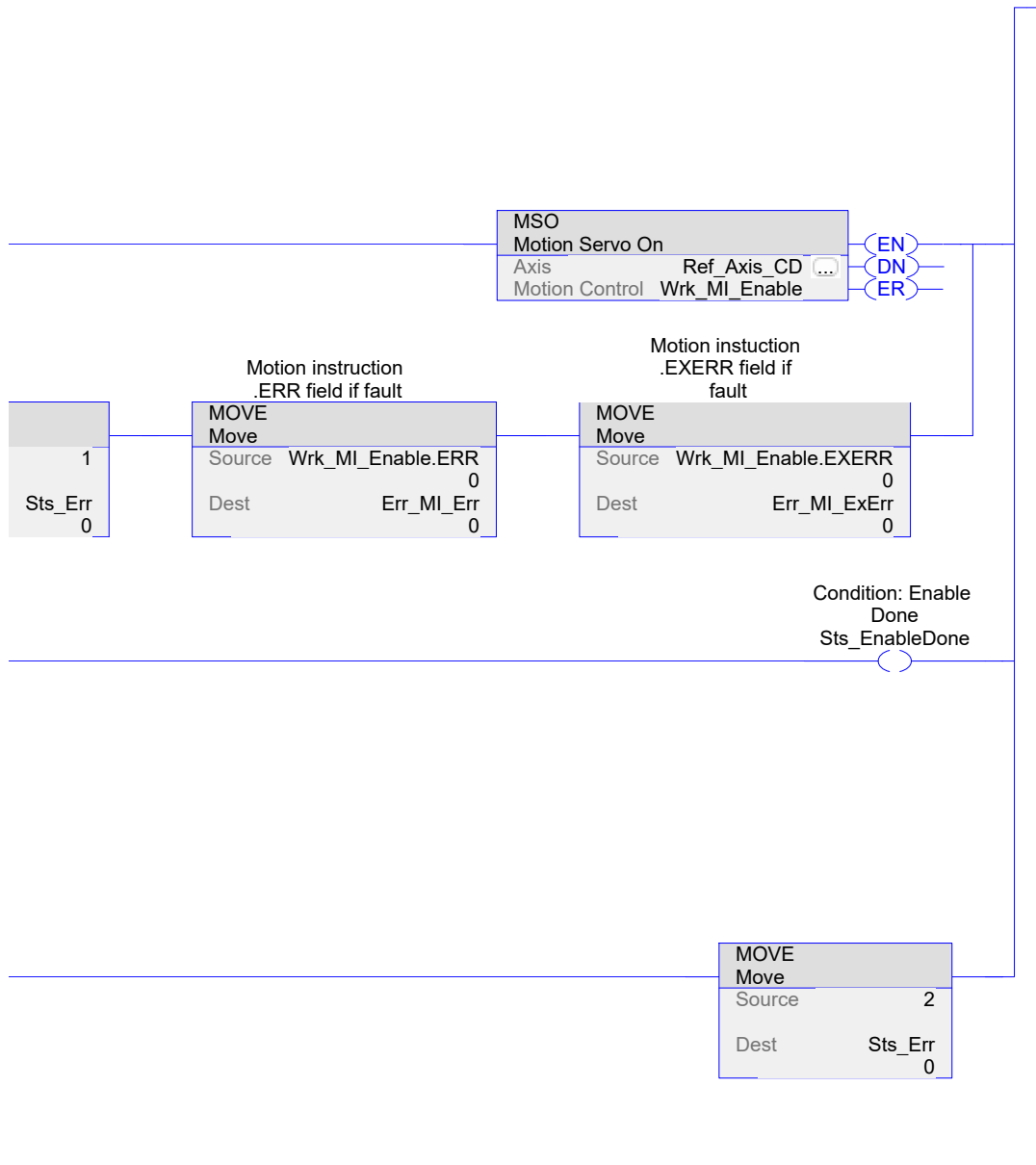
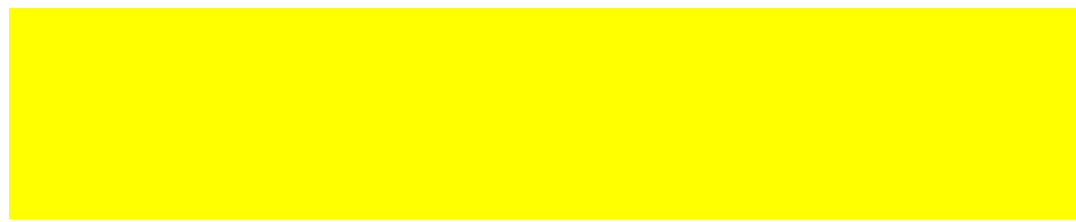
```
////////////////////////////////////  
COMPANY:      Rockwell Automation  
FUNCTION:     AXIS_CIP_DRIVE AOI  
AUTHOR:      Rockwell Automation/Kelvin Erickson Missouri S&T  
DATE UPDATED: July 2020  
  
FUNCTION:  
  
Version Comments: Modified homing sequence to omit check for status of home switch  
////////////////////////////////////
```

[NOP]

```
//////////////////////////////////// CIP AXIS STATE //////////////////////////////////////  
  
- ENUMERATION :  
  
0 = Initializing  
1 = Pre-Charge  
2 = Stopped  
3 = Starting  
4 = Running  
5 = Testing  
6 = Stopping  
7 = Aborting  
8 = Faulted  
9 = Start Inhibited  
10 = Shutdown  
11 = Axis Inhibited  
12 = Not Grouped  
13 = No Module  
14...255 = Reserved
```

CipState	
MOVE	
Move	
Source	Ref_Axis_CD.CIPAxisState ??
Dest	Out_AxisCipState 0



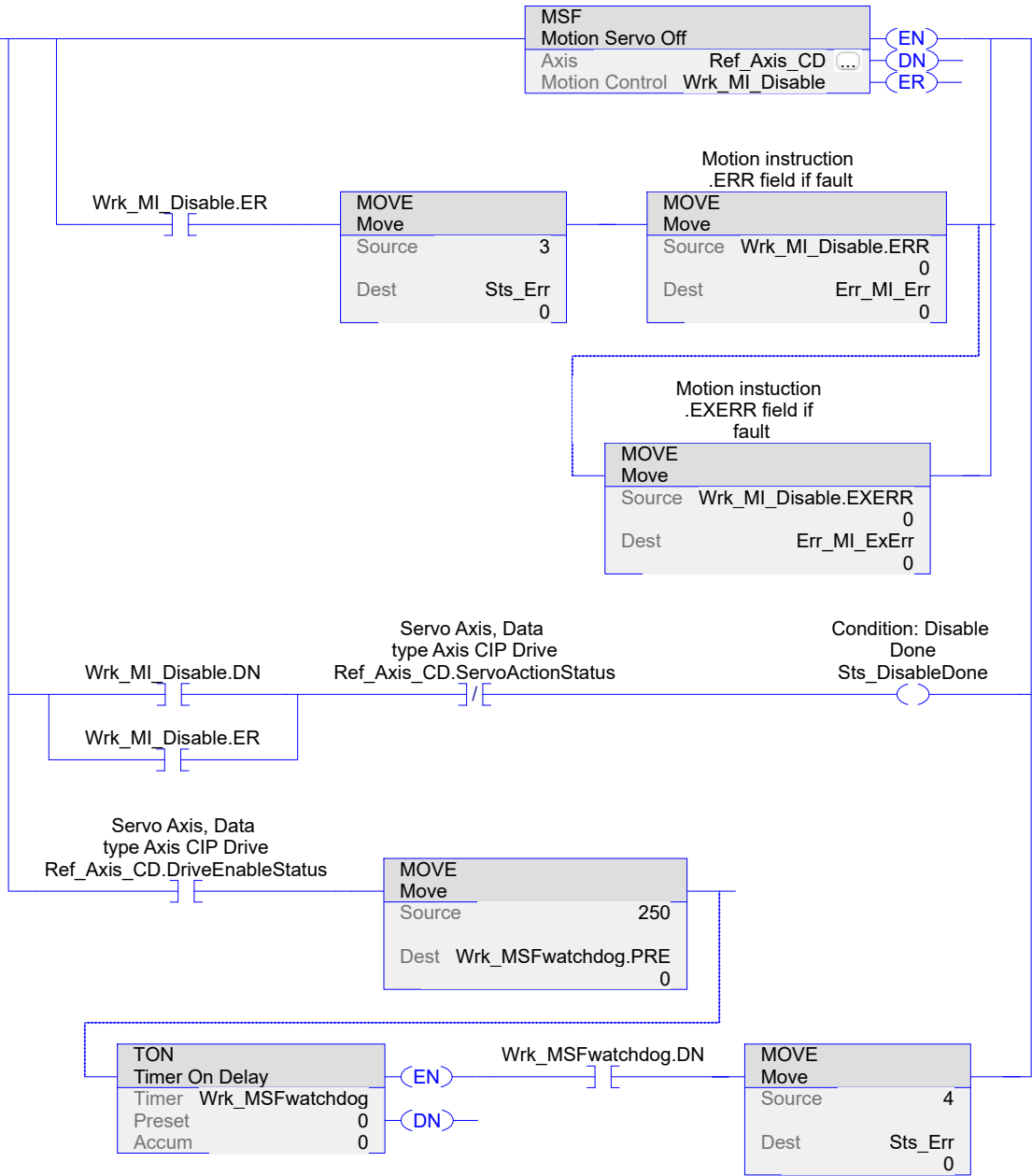


3

SECTION AXIS DISABLE

DISABLE AXIS (OPEN SERVOLOOP)

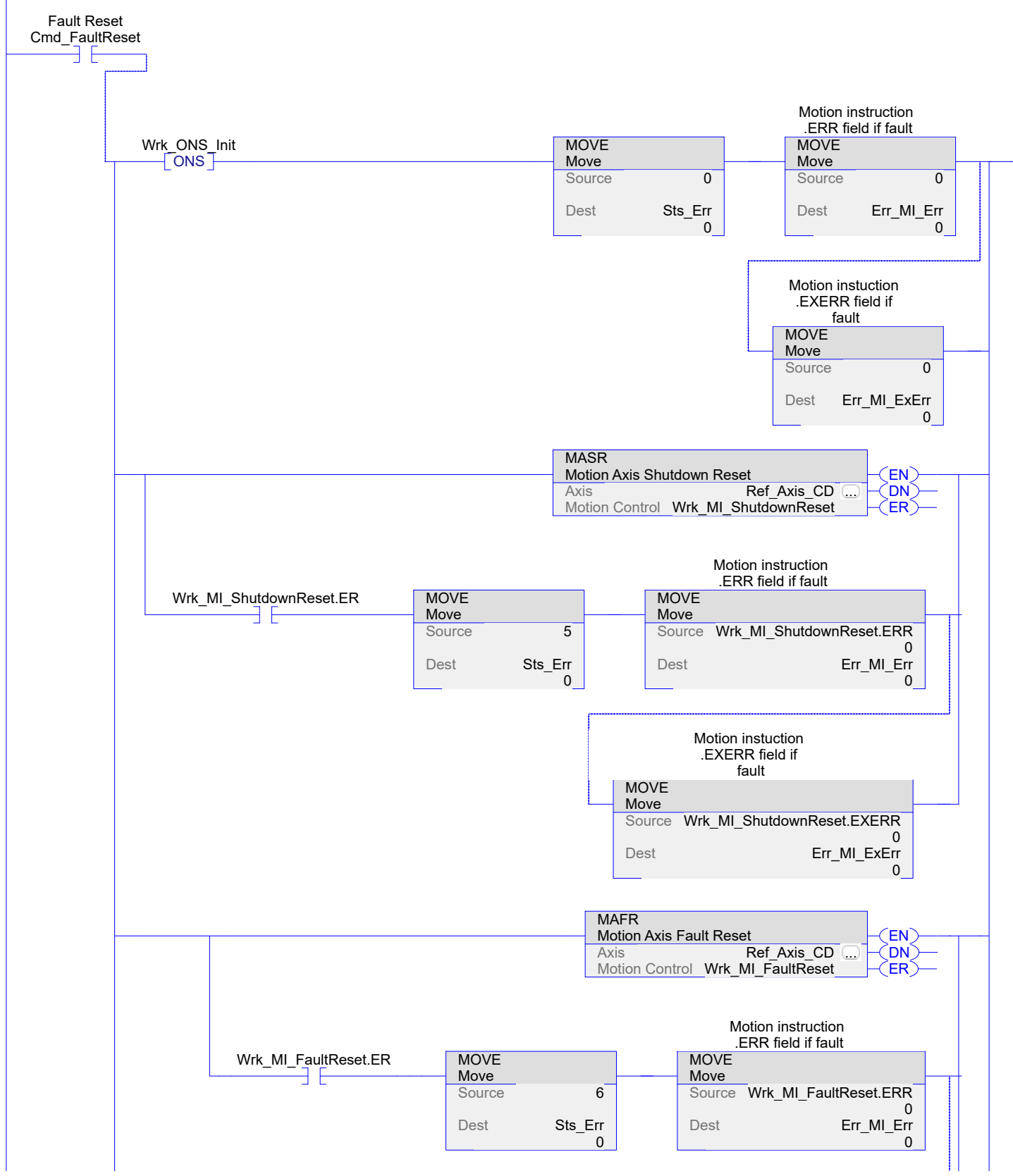
Disables the Axis  
 Cmd\_Disable

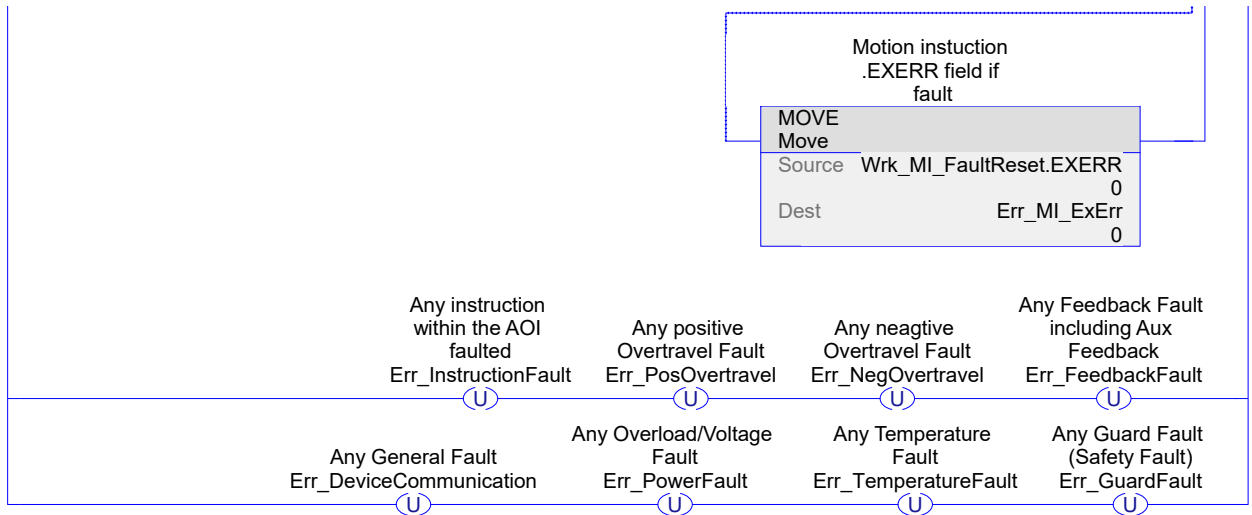


SECTION AXIS FAULT RESET

RESET FAULTs

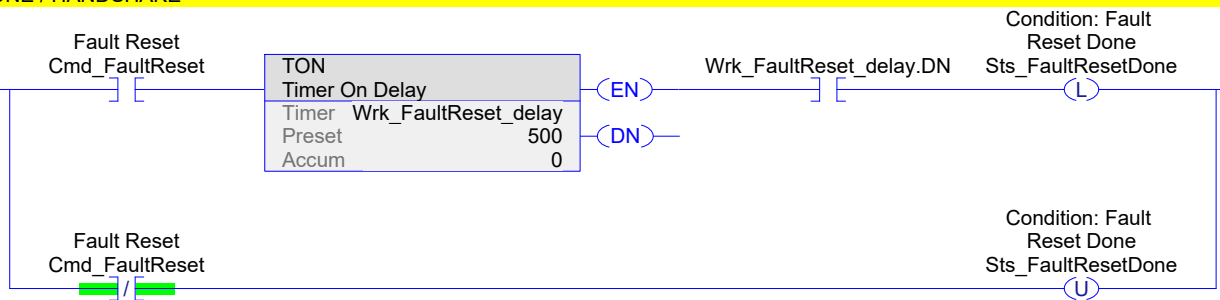
\*\*\*\*\* Corrected to zero Sts\_Err and Sts\_ExtErr only on transition of Cmd\_FaultReset





**FAULT RESET DONE / HANDSHAKE**

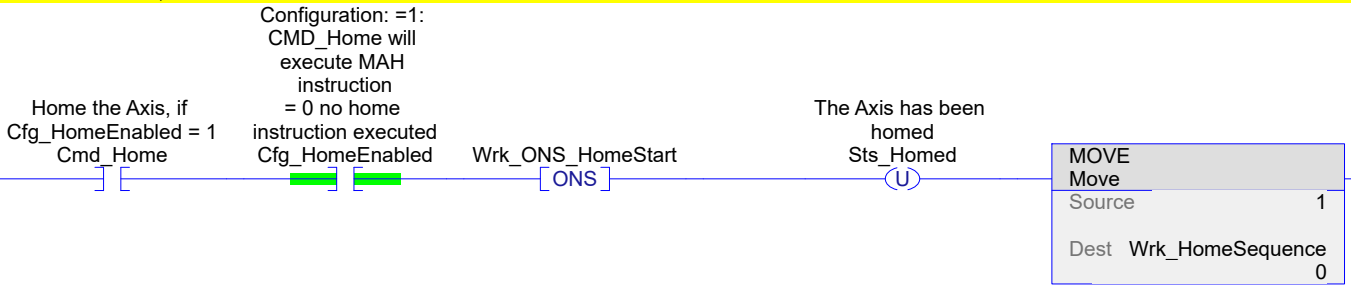
5



-----  
**- SECTION AXIS HOMING**  
 -----

**HOME COMMAND, TO INITIATE THE HOME SEQUENCE**

6



7

**HOME SEQUENCE EXECUTION (CONFIGURATION VIA AXIS PROPERTIES WIZARDS)**

EQ
Equal
Source A Wrk_HomeSequence
0
Source B
1

MAH
Motion Ax
Axis
Motion Co

Wrk\_MI\_Home.ER

MOVE
Move
Source 7
Dest Sts_Err
0

Motion instruction  
 .ERR field if fault

MOVE
Move
Source Wrk_MI_Home.ERR
0
Dest Err_MI_Err
0

Home
Ref_Axis_CD ...
Control Wrk_MI_Home

EN  
 DN  
 ER  
 IP  
 PC

Motion instruction  
 .EXERR field if  
 fault

MOVE
Move
Source Wrk_MI_Home.EXERR
0
Dest Err_MI_ExErr
0

MOVE
Move
Source 2
Dest Wrk_HomeSequence
0

8

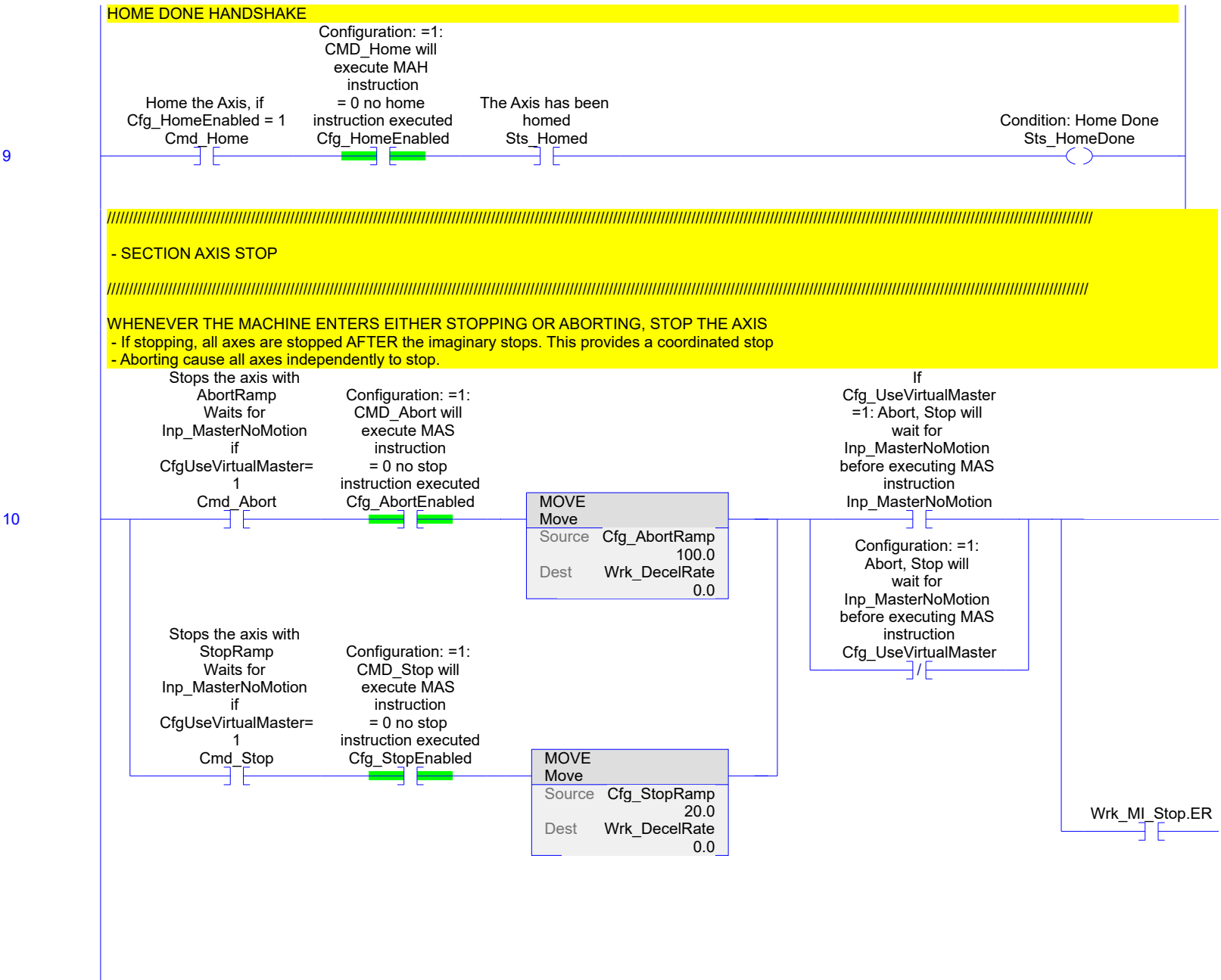
**AXIS IS HOMED**

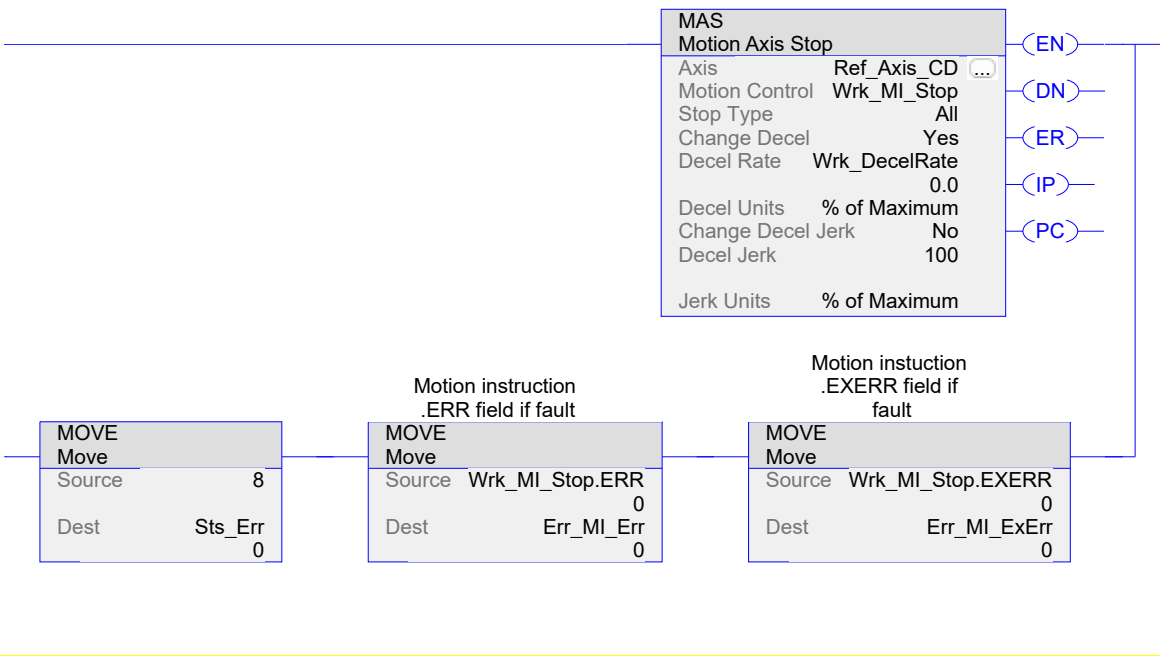
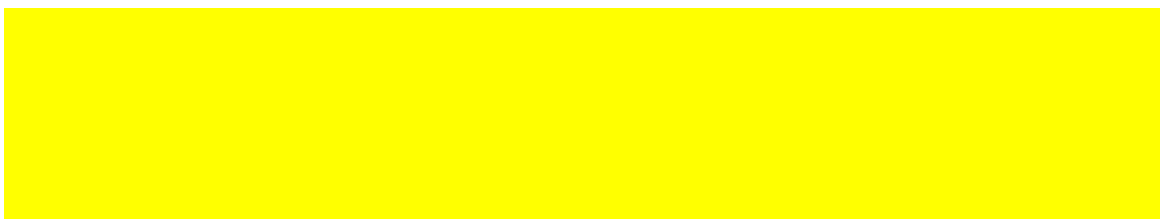
EQ
Equal
Source A Wrk_HomeSequence
0
Source B
2

Wrk\_MI\_Home.PC

The Axis has been  
 homed  
 Sts\_Homed

MOVE
Move
Source 3
Dest Wrk_HomeSequence
0





**STOP DONE HANDSHAKE**

11

AverageVelocity  
 within  
 ZeroSpeedTolerance  
 and no MotionStatus  
 set  
 Sts\_NoMotion

Stops the axis with  
 AbortRamp  
 Waits for  
 Inp\_MasterNoMotion  
 if  
 CfgUseVirtualMaster=  
 1  
 Cmd\_Abort

Configuration: =1:  
 CMD\_Abort will  
 execute MAS  
 instruction  
 = 0 no stop  
 instruction executed  
 Cfg\_AbortEnabled

Condition: Aborting  
 Done  
 Sts\_AbortDone

Stops the axis with  
 StopRamp  
 Waits for  
 Inp\_MasterNoMotion  
 if  
 CfgUseVirtualMaster=  
 1  
 Cmd\_Stop

Configuration: =1:  
 CMD\_Stop will  
 execute MAS  
 instruction  
 = 0 no stop  
 instruction executed  
 Cfg\_StopEnabled

Condition: Stopping  
 Done  
 Sts\_StopDone

**- SECTION STATUS BIT UPDATE**

12

[NOP]

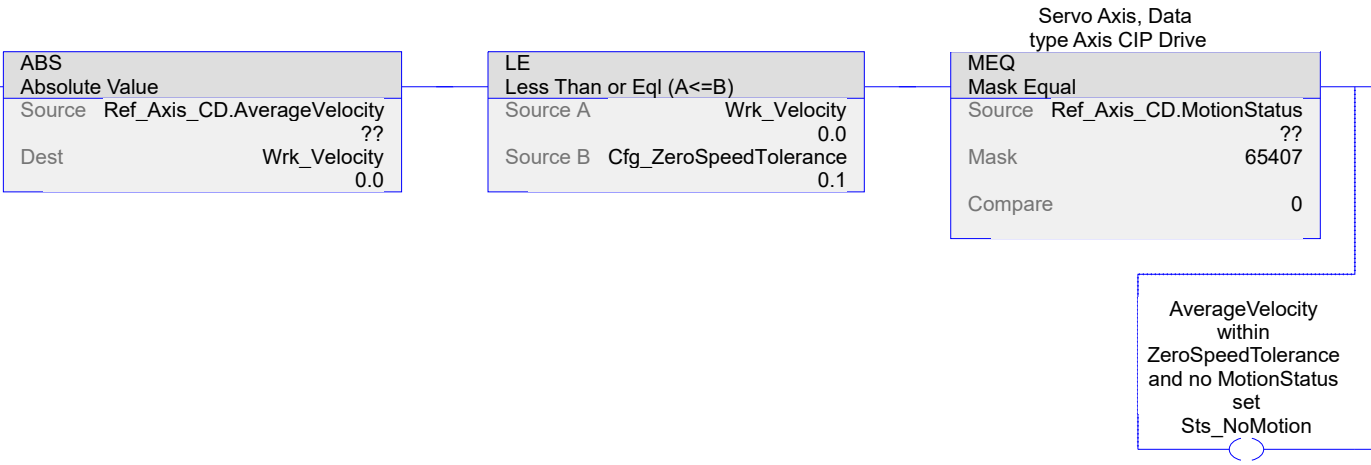
//////////////////////////////////// CIP AXIS //////////////////////////////////////

- NO AXIS MOVEMENT

Description : MotionStatus  
 Bit 00 AccelStatus  
 Bit 01 DecelStatus  
 Bit 02 MoveStatus  
 Bit 03 JogStatus  
 Bit 04 GearingStatus  
 Bit 05 HomingStatus  
 Bit 06 StoppingStatus  
 Bit 07 AxisHomedStatus  
 Bit 08 PositionCamStatus  
 Bit 09 TimeCamStatus  
 Bit 10 PositionCamPendingStatus  
 Bit 11 TimeCamPendingStatus  
 Bit 12 GearingLockStatus  
 Bit 13 PositionCamLockStatus  
 Bit 14 MasterOffsetMoveStatus  
 Bit 15 CoordinatedMotionStatus

65407 = 1111 1111 0111 1111

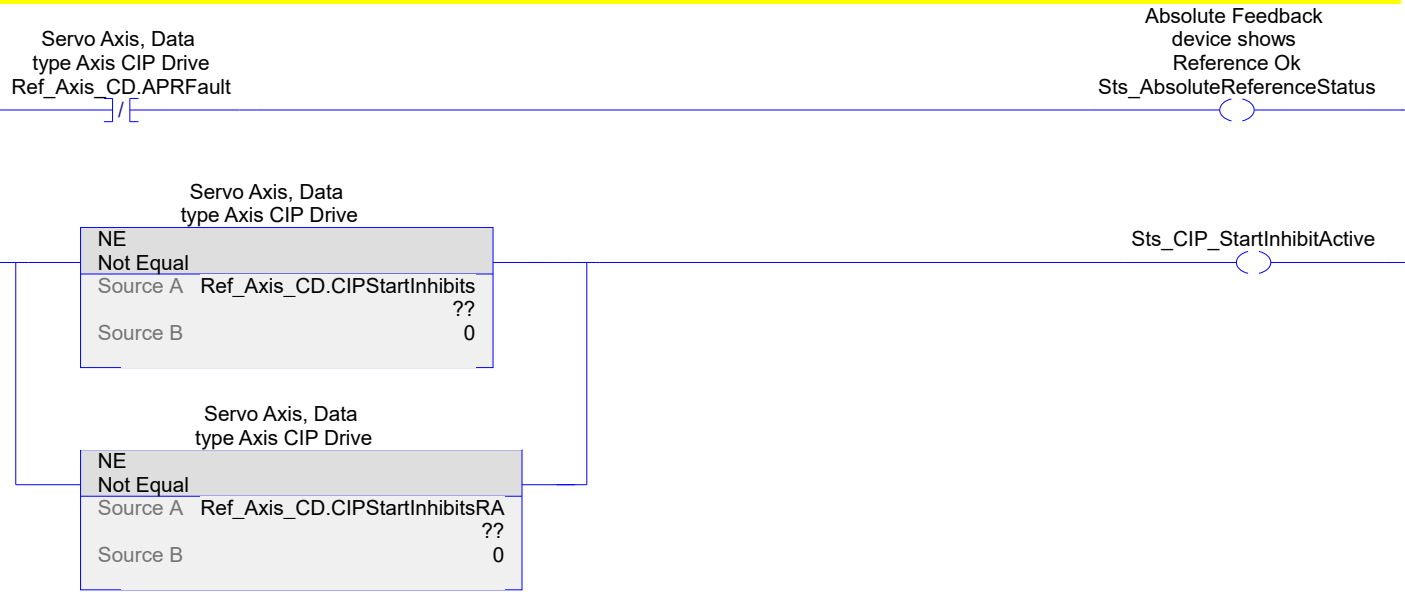
13



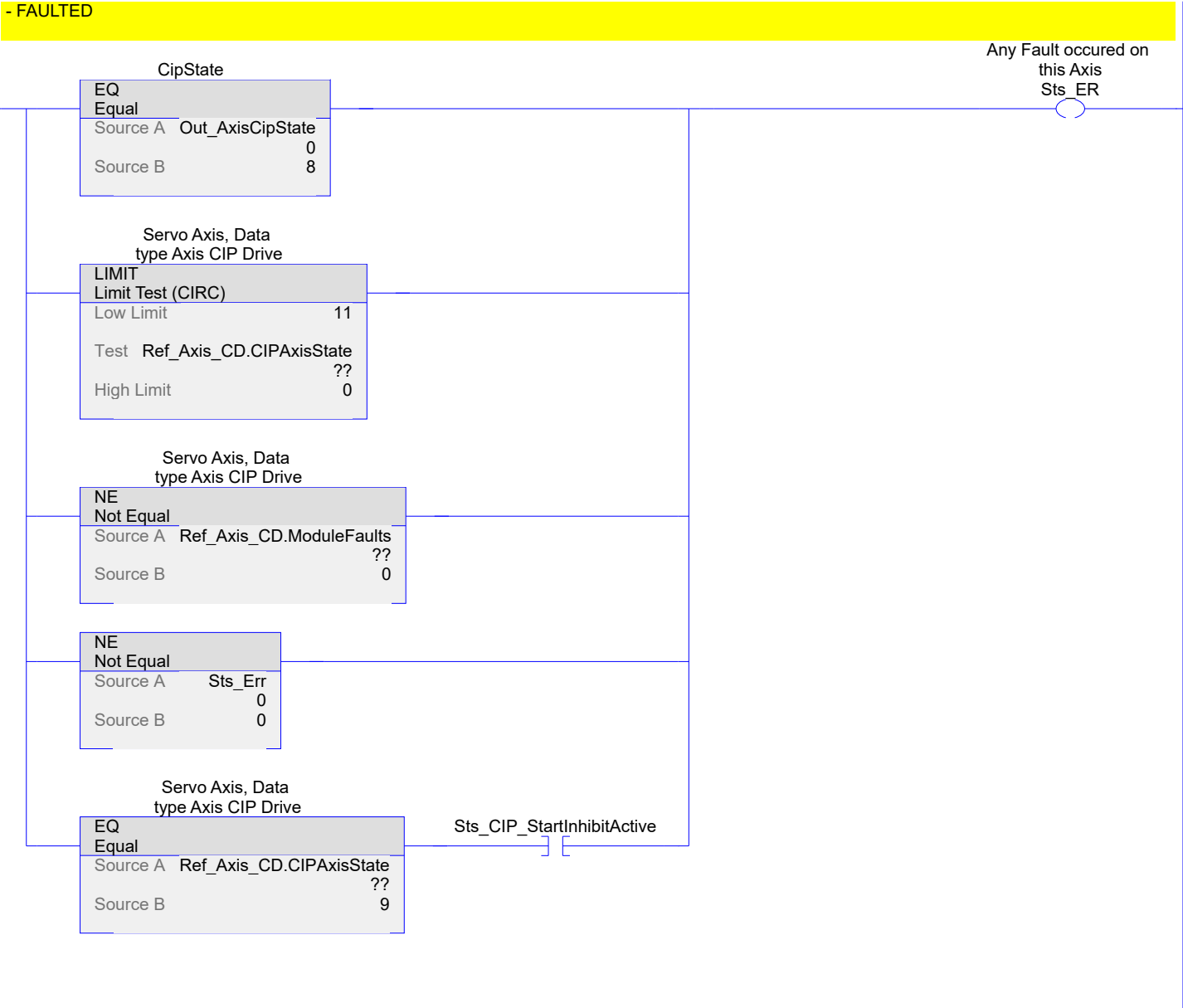
- ABSOLUTE REFERENCE STATUS INFORMATION

14

15



16



17

- AOI INSTRUCTION FAULTS Sts\_Err holds location of motion instruction fault  
1 = Enable MSO error  
2 = Enable timeout. MSO did not complete in 250 ms. Err\_MI\_Err and Err\_MI\_ExErr are zero.  
3 = Disable MSF error  
4 = Disable timeout. MSF did not complete in 250 ms. Err\_MI\_Err and Err\_MI\_ExErr are zero.  
5 = Fault reset MASR error  
6 = Fault reset MAFR error  
7 = Homing MAH error  
8 = Stopping MAS error

Any instruction within the AOI faulted  
Err\_InstructionFault

<b>NE</b> <b>Not Equal</b>	
Source A	Sts_Err 0
Source B	0

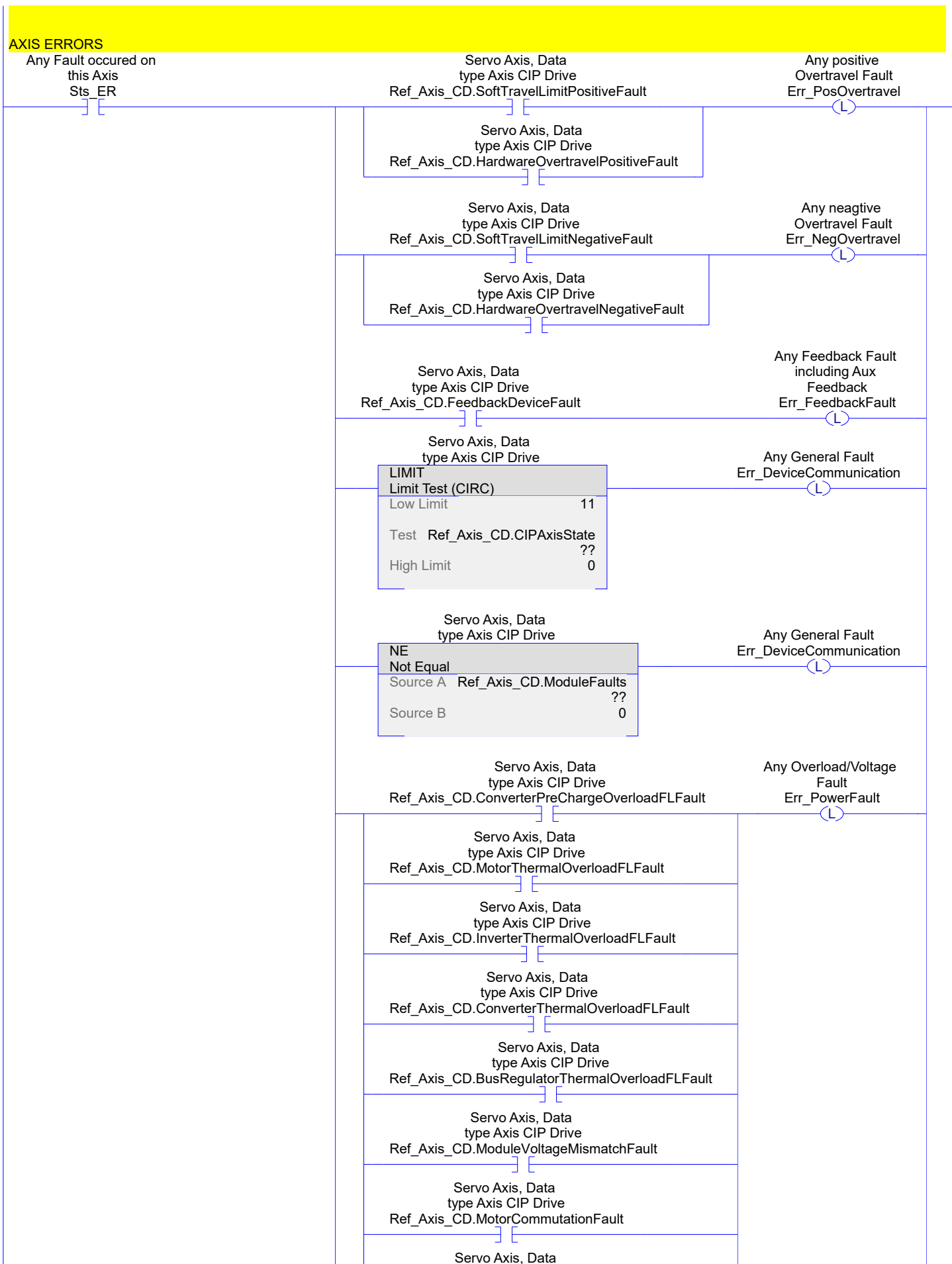


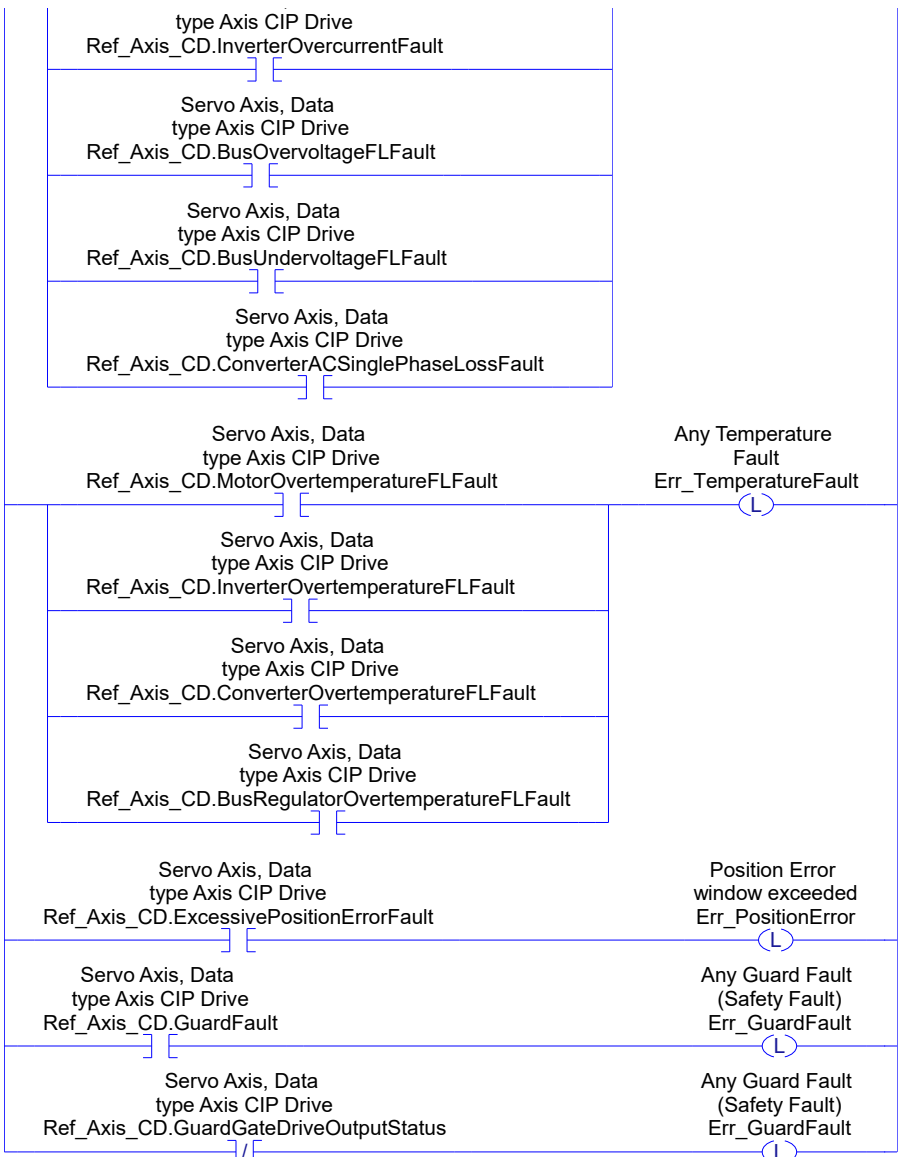
Any instruction within the AOI faulted  
Err\_InstructionFault

<b>EQ</b> <b>Equal</b>	
Source A	Sts_Err 0
Source B	0

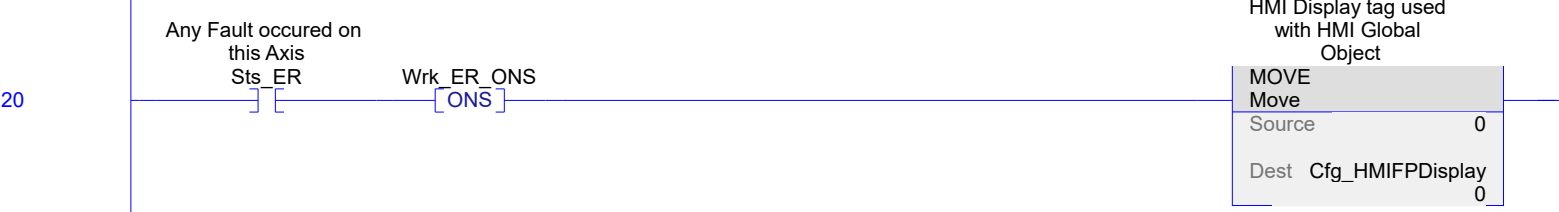
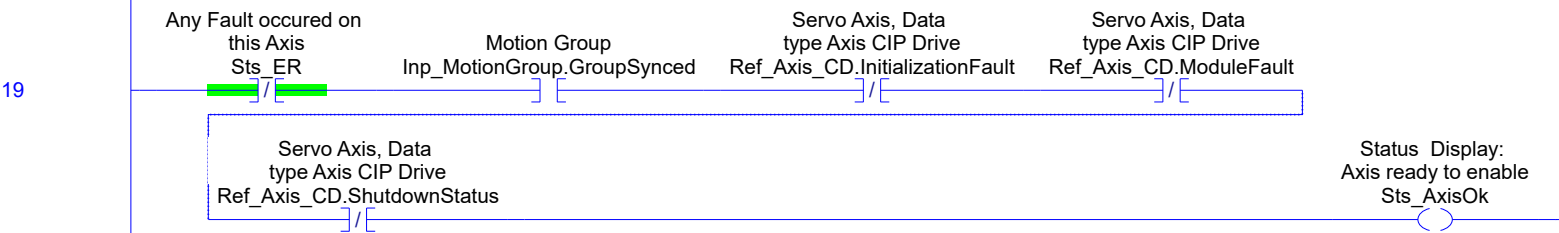


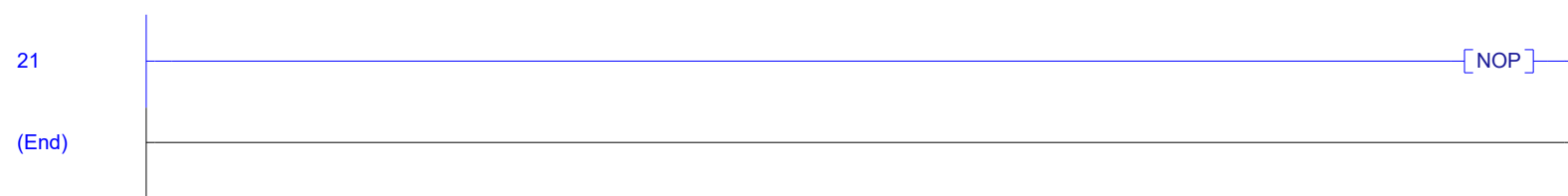
18





**AXIS IS OK AND READY**





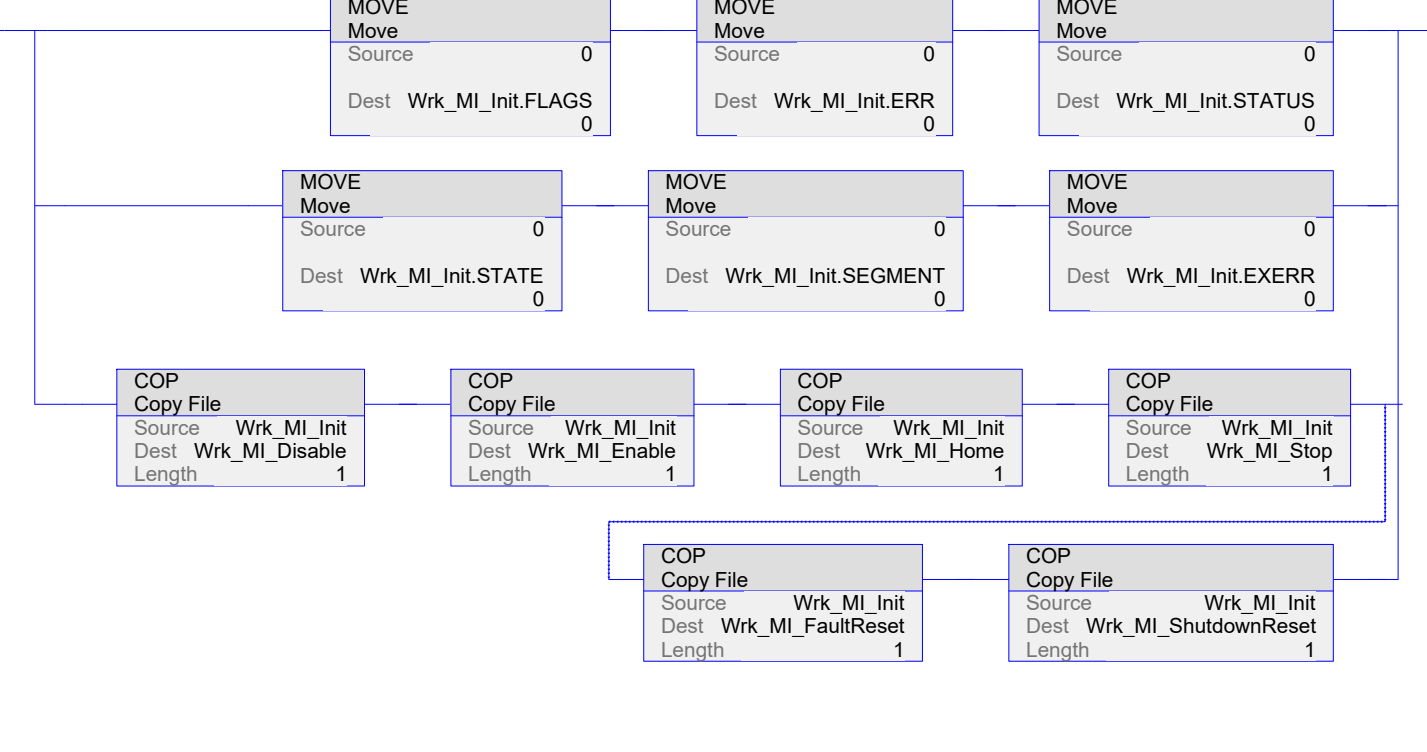
COMPANY: Rockwell Automation  
 FUNCTION: AXIS\_CIP\_DRIVE AOI  
 AUTHOR: Rockwell Automation  
 DATE UPDATED: Jun 2011

FUNCTION:

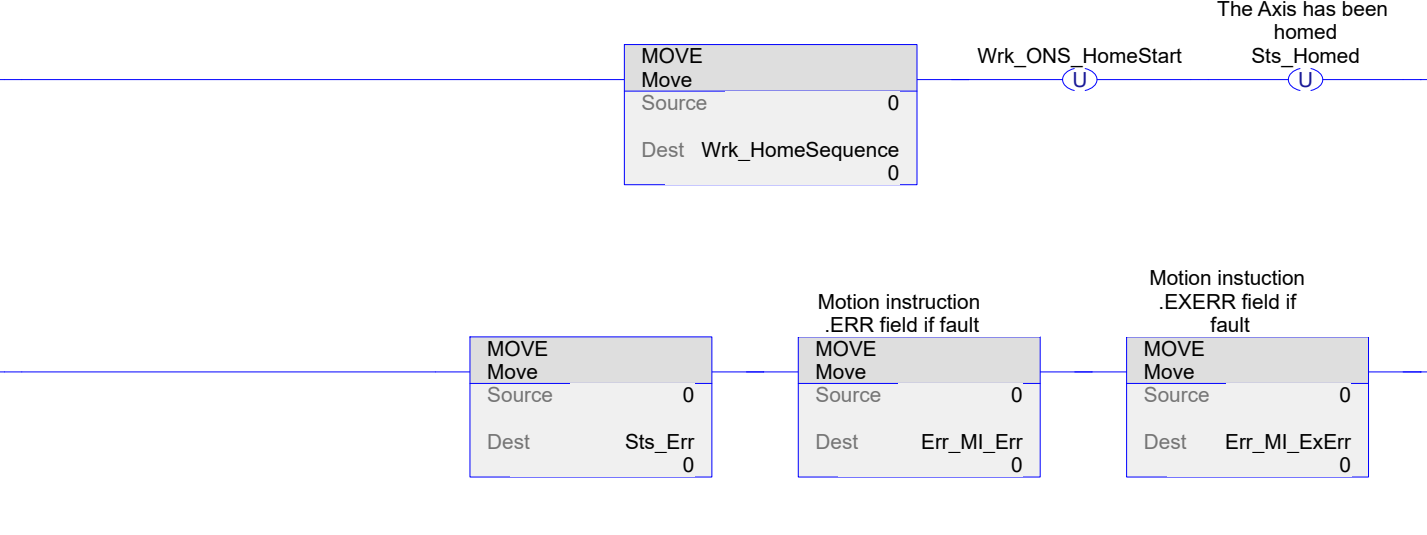
Version Comments:

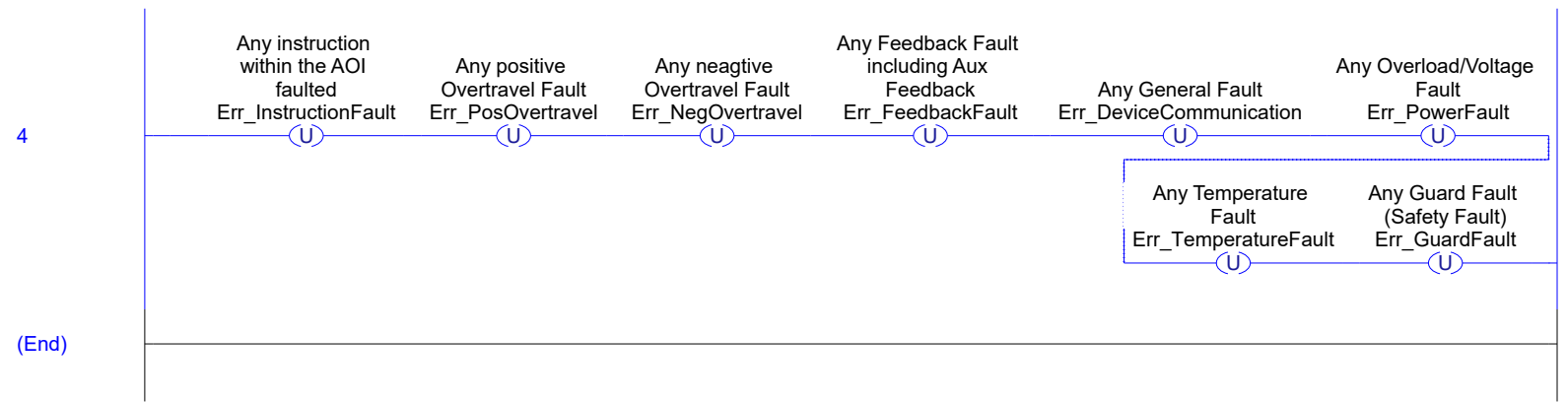
[NOP]

**PRESCAN INIT - Motion Instruction**



**PRESCAN INIT - HomeSequence**





 PackMLv3\_StateModel v2.3

Rockwell Automation

Available Languages

 Relay Ladder

PackMLv3_StateModel		
PackMLv3_StateModel	?	(Sts_ModeChangeNotAllowed)
Cfg_ModeTransitions	?	(Sts_Clearing)
Cfg_DisableStates	?	(Sts_Stopped)
Cfg_ModeNames	?	(Sts_Starting)
Cmd_Mode	?	(Sts_Idle)
Cmd_Reset	?	(Sts_Suspended)
Cmd_Start	?	(Sts_Execute)
Cmd_Stop	?	(Sts_Stopping)
Cmd_Hold	?	(Sts_Aborting)
Cmd_UnHold	?	(Sts_Aborted)
Cmd_Suspend	?	(Sts_Holding)
Cmd_UnSuspend	?	(Sts_Held)
Cmd_Abort	?	(Sts_UnHolding)
Cmd_Clear	?	(Sts_Suspending)
Cmd_StateComplete	?	(Sts_UnSuspending)
Sts_StateCurrentName	?	(Sts_Resetting)
Sts_ModeCurrentName	?	(Sts_Completing)
		(Sts_Complete)

 Function Block

PackMLv3\_StateModel

- Cfg\_ModeTransitions ?
- Cfg\_DisableStates ?
- Cfg\_ModeNames ?
- Cmd\_Mode
- Cmd\_Reset
- Cmd\_Start
- Cmd\_Stop
- Cmd\_Hold
- Cmd\_UnHold
- Cmd\_Suspend
- Cmd\_UnSuspend
- Cmd\_Abort
- Cmd\_Clear
- Cmd\_StateComplete
- Sts\_StateCurrentName ?
- Sts\_ModeCurrentName ?
- Sts\_ModeChangeNotAllowed
- Sts\_Clearing
- Sts\_Stopped
- Sts\_Starting
- Sts\_Idle
- Sts\_Suspended
- Sts\_Execute
- Sts\_Stopping
- Sts\_Aborting
- Sts\_Aborted
- Sts\_Holding
- Sts\_Held
- Sts\_UnHolding
- Sts\_Suspending
- Sts\_UnSuspending
- Sts\_Resetting
- Sts\_Completing
- Sts\_Complete

Structured Text

PackMLv3\_StateModel(Cfg\_ModeTransitions, Cfg\_DisableStates, Cfg\_ModeNames, Sts\_StateCurrentName, Sts\_ModeCurrentName);

Parameters

Required	Name	Data Type	Usage	Description
X	PackMLv3_StateModel	PackMLv3_StateModel	InOut	
	EnableIn	BOOL	Input	
	EnableOut	BOOL	Output	
X	Cfg_ModeTransitions	DINT	InOut	Acceptable States to Transition Between Modes
X	Cfg_DisableStates	DINT	InOut	Disable States for Different Modes
X	Cfg_ModeNames	String_Short	InOut	Mode Names
	Cmd_Mode	DINT	Input	Commanded Mode
	Cmd_Reset	BOOL	Input	Request that current state transition to Resetting
	Cmd_Start	BOOL	Input	Request that current state transition to Starting
	Cmd_Stop	BOOL	Input	Request that current state transition to Stopping
	Cmd_Hold	BOOL	Input	Request that current state transition to Holding
	Cmd_UnHold	BOOL	Input	Request that current state transition to Execute
	Cmd_Suspend	BOOL	Input	Request that current state transition to Suspending
	Cmd_UnSuspend	BOOL	Input	Request that current state transition to Execute

Cmd_Abort	BOOL	Input	Request that current state transition to Aborting
Cmd_Clear	BOOL	Input	Request that current state transition to Clearing
Cmd_StateComplete	BOOL	Input	PackML State Complete Command - Latch Cmd_StateComplete to allow transition from acting state to wait state
Cfg_RemoteCmdEnable	BOOL	Input	Enable Remote Commands
Inp_RemoteModeCmd	DINT	Input	Mode Remote Command Interface
Inp_RemoteModeCmdChangeRequest	BOOL	Input	Mote Remote Command Change Request
Inp_RemoteStateCmd	DINT	Input	State Remote Command Interface
Inp_RemoteStateCmdChangeRequest	BOOL	Input	State Remote Command Change Request
Sts_StateCurrent	DINT	Output	Current State ID
Sts_ModeCurrent	DINT	Output	Current Mode ID
Sts_EnabledStates	DINT	Output	Currently Disabled States = 0
X Sts_StateCurrentName	String_Short	InOut	Current State Name
X Sts_ModeCurrentName	String_Short	InOut	Current Mode Name
Sts_ClearingEnabled	BOOL	Output	Use of the Clearing state for the current mode is enabled
Sts_StoppedEnabled	BOOL	Output	Use of the Stopped state for the current mode is enabled
Sts_StartingEnabled	BOOL	Output	Use of the Starting state for the current mode is enabled
Sts_IdleEnabled	BOOL	Output	Use of the Idle state for the current mode is enabled
Sts_SuspendedEnabled	BOOL	Output	Use of the Suspended state for the current mode is enabled
Sts_ExecuteEnabled	BOOL	Output	Use of the Execute state for the current mode is enabled
Sts_StoppingEnabled	BOOL	Output	Use of the Stopping state for the current mode is enabled
Sts_AbortingEnabled	BOOL	Output	Use of the Aborting state for the current mode is enabled
Sts_AbortedEnabled	BOOL	Output	Use of the Aborted state for the current mode is enabled
Sts_HoldingEnabled	BOOL	Output	Use of the Holding state for the current mode is enabled
Sts_HeldEnabled	BOOL	Output	Use of the Held state for the current mode is enabled
Sts_UnHoldingEnabled	BOOL	Output	Use of the UnHolding state for the current mode is enabled
Sts_SuspendingEnabled	BOOL	Output	Use of the Suspending state for the current mode is enabled
Sts_UnSuspendingEnabled	BOOL	Output	Use of the UnSuspending state for the current mode is enabled
Sts_ResettingEnabled	BOOL	Output	Use of the Resetting state for the current mode is enabled
Sts_CompletingEnabled	BOOL	Output	Use of the Completing state for the current mode is enabled
Sts_CompleteEnabled	BOOL	Output	Use of the Complete state for the current mode is enabled
Sts_ModeChangeNotAllowed	BOOL	Output	Mode Change Request Was Denied
Sts_Clearing	BOOL	Output	The Clearing state is active.
Sts_Stopped	BOOL	Output	The Stopped state is active.
Sts_Starting	BOOL	Output	The Starting state is active.
Sts_Idle	BOOL	Output	The Idle state is active.
Sts_Suspended	BOOL	Output	The Suspended state is active.
Sts_Execute	BOOL	Output	The Execute state is active.
Sts_Stopping	BOOL	Output	The Stopping state is active.
Sts_Aborting	BOOL	Output	The Aborting state is active.
Sts_Aborted	BOOL	Output	The Aborted state is active.
Sts_Holding	BOOL	Output	The Holding state is active.
Sts_Held	BOOL	Output	The Held state is active.
Sts_UnHolding	BOOL	Output	The Unholding state is active.
Sts_Suspending	BOOL	Output	The Suspending state is active.
Sts_UnSuspending	BOOL	Output	The UnSuspending state is active.
Sts_Resetting	BOOL	Output	The Resetting state is active.
Sts_Completing	BOOL	Output	The Completing state is active.
Sts_Complete	BOOL	Output	The Complete state is active.

**Extended Description**

Instruction Overview:

-----  
 The PackML State Model Add-On Instruction provides an implementation of the Modes and States defined by PackML v3.0.

Instruction Execution:

-----  
 This AOI is intended to be scanned unconditionally

## Supplemental Descriptions:

-----

These configuration tags need to be configured for the AOI to work correctly:

- Cfg\_ModeNames
- Cfg\_ModeTransitions
- Cfg\_DisableStates

## Cfg\_ModeNames (Configure Mode Names)

The state model can operate in various modes. Up to 31 different modes can be used (array index 1...31). Array number 0 (zero) is reserved and cannot be used.

The template has two predefined modes, Produce and Manual. Additional modes either user defined or defined by ISA-TR88 can be added by the user.

## Cfg\_ModeTransitions (Configure Mode Transitions)

Cfg\_ModeTransitions is used to define acceptable states to transition between modes. In this way you can allow a mode change, such as from Produce mode to Manual mode,

in the Execute state. The tag consists of an array of 32 DINT, each corresponding to one of the possible modes.

- Cfg\_ModeName[1] = Cfg\_ModeTransitions[1]
- Cfg\_ModeName[2] = Cfg\_ModeTransitions[2]

....

- Cfg\_ModeName[31] = Cfg\_ModeTransitions[31]

Each individual bit of the DINT corresponds to a specific state as follows.

The template has the following defined for both Automatic and Manual mode:

Cfg\_ModeTransitions[1] = 516 [dec] = 0000 0000 0000 0000 0000 0010 0000 0100 [bin]

That means the template only allows a mode change in Stopped and Aborted state.

## Cfg\_DisableStates (Configure Disabling of States)

The template is very flexible and allows you to use only the states that are needed for a particular mode. The states that are not used will be jumped in the program and will not be visible on the state machine overview on the HMI application.

Each individual bit of the DINT corresponds to a specific state as follows.

## Produce Mode

Cfg\_DisableStates[1] = 228400 [dec] = 0000 0000 0000 0011 0111 1100 0011 0000 [bin]

That means the template disables the Idle, Suspended, Held, Un-Holding, Suspending, Un-Suspending, Completing, and Complete states.

## Manual Mode

Cfg\_DisableStates[3] = 228408 [dec] = 0000 0000 0000 0011 0111 1100 0011 1000 [bin]

That means the template disables the Starting, Idle, Suspended, Holding, Held, Un-holding, Suspending, Un-Suspending, Completing, and Complete states.

## Cfg\_RemoteCmdEnable (Configure Remote Commands)

The AOI can be controlled via remote commands outside the unit (machine) such as with a line control (cell control).

## Cfg\_RemoteCmdEnable

## Behavior

- 0 Remote command control is disabled
- 1 Remote command control is enabled

## Cmd\_xx (Commands)

The AOI makes use of the following commands that will request a state or mode change:

- Cmd\_Mode
- Cmd\_Suspend
- Cmd\_Reset
- Cmd\_UnSuspend
- Cmd\_Start
- Cmd\_Abort
- Cmd\_Stop
- Cmd\_Clear
- Cmd\_Hold
- Cmd\_StateComplete

## Cmd\_UnHold

All commands but two (Cmd\_Mode and Cmd\_Reset) have the same behavior. If Cmd\_xx is set, the respective command is initiated if the actual state allows this command.

According to PackML, the route in the state machine is dictated by the arrows.

## Cmd\_Mode

Cmd\_Mode (command mode) will request a mode change and will only be accepted according to the configuration of Cfg\_ModeTransitions.

Here it is defined if the individual states allow a change. If Cmd\_Mode is set and the active state does not allow it, the Sts\_ModeChangeNotAllowed status bit will be set.

## Cmd\_Reset

If Cmd\_Reset (command reset) is set, a reset command is initiated. According to PackML, this command is used in either Complete or Stopped state to initiate a Resetting state.

For a more intuitive mechanism, the template uses this command slightly differently, and will only allow this in Aborted. It will transition from Aborted to Clearing and is handled as a fault reset.

## Inp\_RemoteXX (Input)

Remote control of mode and state commands is possible.

## Remote Mode

### Inp\_RemoteModeCmd

Usage: Input

Type: DINT

Description: Mode Remote Command Interface

### Inp\_RemoteModeCmdChangeRequest

Usage: Input

Type: BOOL

Description: Mode Remote Command Change Request

The local equivalent to Inp\_RemoteModeCmd is Cmd\_Mode, and its behavior is similar.

Inp\_RemoteModeCmdChangeRequest is used to request a mode change – remote. There is no local equivalent to it.

## Remote State

### Inp\_RemoteStateCmd

Usage: Input

Type: DINT

Description: State Remote Command Interface

### Inp\_RemoteStateCmdChangeRequest

Usage: Input

Type: BOOL

Description: State Remote Command Change Request

The local equivalent to Inp\_RemoteStateCmd is Cmd\_XX (the individual commands), and the behavior is similar.

The remote word is a DINT where the individual bits will correspond to a specific command.

Inp\_RemoteStateCmdChangeRequest is used to request a state change – remote. There is no local equivalent to it.

## Sts\_XX (Status)

The AOI produces status for states and modes.

Status indicators for states

The AOI will produce an output status for each individual state. Only one of them can be set at any time, as it is the actual state of the state machine.

Sts\_Aborted

Sts\_Completing

Sts\_Idle

Sts\_Stopping

Sts\_Aborting

Sts\_Execute

Sts\_Resetting

Sts\_Suspended

Sts\_Clearing

Sts\_Held

Sts\_Starting  
 Sts\_Suspending  
 Sts\_Complete  
 Sts\_Holding  
 Sts\_Stopped  
 Sts\_UnHolding  
 Sts\_UnSuspending

Sts\_EnabledStates      Currently Disabled States = 0  
 Sts\_StateCurrent      Current State ID  
 Sts\_StateCurrentName Current State Name  
 Sts\_StateCurrentName Current State Name

Status indicators for modes

Sts\_ModeChangeNotAllowed  
 Usage:            Output  
 Type:            BOOL  
 Description:    Mode Change Request Was Denied

Sts\_ModeCurrent  
 Usage:            Output  
 Type:            DINT  
 Description:    Current Mode ID

Sts\_ModeCurrentName  
 Usage:            InOut  
 Type:            STRING  
 Description:    Current Mode Name

States - Descriptions

The PackML state machine consists of 17 states. The description and intention of each is listed below.

State Name

STOPPED {Down}

State Type: Wait

The machine is powered and stationary. All communications with other systems are functioning (if applicable).

STARTING {STARTUP}

State Type: Acting

This state provides the steps needed to start the machine and is a result of a starting type command (local or remote). Following this command, the machine will begin to “execute”.

IDLE [READY]

State Type: Wait

This is a state which indicates that RESETING is complete. This state maintains the machine conditions which were achieved during the RESET state.

SUSPENDING

State Type: Acting

This state is a result of a command change from the EXECUTE state. This state is typically required prior to the SUSPENDED wait state, and prepares the machine (for example, stops glue cycles, stops carton feeds, etc.) prior to the SUSPEND state.

SUSPENDED [RUNNING] {STANDBY}

State Type: Wait

The machine may be running at the relevant setpoint speed, but there is no product being produced. This state can be reached as a result of a machine status, and differs from HELD in that HELD is typically a result of an operator request.

UN SUSPENDING

State Type: Acting

This state is a result of a request from SUSPENDED state to go back to the EXECUTE state. The actions of this state may include: ramping up speeds, turning on vacuums, the re-engagement of clutches. This state is done prior to EXECUTE state, and prepares the machine for the EXECUTE state.

**EXECUTE [PRODUCING] {RUN}**

State Type: Dual

State Once the machine is processing materials, it is deemed to be Executing or in the EXECUTE state. Execute refers to the mode in which the machine is in. If the machine is in the "Clean Out" mode, then "execute" refers to the action of cleaning the machine.

**STOPPING {RUNOUT}**

State Type: Acting

This state executes the logic which brings the machine to a controlled and safe stop.

**ABORTING**

State Type: Acting

The ABORTED state can be entered at any time in response to the Abort command or on the occurrence of a machine fault. The aborting logic will bring the machine to a rapid, controlled safe stop. Operation of the Emergency Stop will cause the machine to be tripped by its safety system. It will also provide a signal to initiate the ABORTING State.

**ABORTED**

State Type: Wait

This state maintains machine status information relevant to the Abort condition. The Stop command will force transition to the Stopped state.

**HOLDING**

State Type: Acting

When the machine is in the EXECUTE state, the Hold command can be used to start HOLDING logic which brings the machine to a controlled stop or to a state which represents HELD for the particular machine mode.

**HELD**

State Type: Wait

The HELD state is typically be used by the operator to hold the machine's operation temporarily while material blockages are cleared, or to stop throughput while a downstream problem is resolved.

**UNHOLDING**

State Type: Acting

UNHOLDING prepares the machine to re-enter the EXECUTE state. The UNHOLDING state is typically a response to an operator command to resume EXECUTE state.

**COMPLETING**

State Type: Acting

This state is typically an automatic response from the EXECUTE state. Normal operation has run to completion, that is, processing of material at the infeed will stop

**COMPLETE**

State Type: Wait

The machine has finished the COMPLETING state and is now waiting for a STOP command that will cause a transition to the STOPPED state.

**RESETTING**

State Type: Acting

This element is the result of a RESET command from the STOPPED state. RESETTING will typically cause a machine to sound a horn and place the machine in a state where components are energized awaiting a START command.

**CLEARING**

State Type: Acting

The procedural element has received a command to clear faults that may have occurred when ABORTING, and are present in the ABORTED state before proceeding to a STOPPED state.

Not all states are configured in this template, but the AOI supports it

**HMI - PackML State Machine**

The AOI comes with a face plate, where all states of the PackML state machine are shown. The active state is indicated with a green background.

Only states that are not disabled will be shown. In this template, Automatic Mode will only show Aborting, Aborted, Clearing, Stopping, Stopped, Resetting, Starting, and Execute state.

Mode Selector

It is possible to change between the different modes that have been configured. The template has two different modes: Automatic and Manual. If you try to change mode in a state that does not allow a mode change, you will be notified by a red bar with the text: Requested Mode Change Not Allowed.

---

#### General Information - Parameter Prefixing:

Inp\_

-----

Input:

Generally used to designate a connection to a real I/O input point or an upstream block.

Set\_

-----

Setpoint:

Used as a setpoint coming into the instruction. May come from the operator via the HMI, or from the controller program itself.

Cmd\_

-----

Command:

Generally used to as a command input either from the operator via the HMI or from the program.

Cfg\_

-----

Configuration:

Generally used to designate a configuration value.

Typically, but not always, something that is only changed irregularly.

Par\_

-----

Parameter:

Equipment parameter or input parameter from Batching systems.

Generally used to designate a value that receives changes on a regular basis.

Wrk\_

-----

Working Register:

In many cases the control routine will require some internal working storage locations.

This is targeted at the control routine that lies inside a normal UDT.

In the case of AOI's, these registers can simply become "Local Tags".

Out\_

-----

Output:

Generally used to designate a connection to a real I/O output point or a downstream block.

Val\_

-----

Value:

Designates a value calculated inside the instruction, which may or may not be the primary output of the instruction.

Rpt\_

-----

Report:

Designates a value calculated inside the instruction that is typically used for batch reporting.

Sts\_

-----

Status:

Status of the instruction. Also contains two required members.

Ex.  
 Sts\_Alarm - An alarm exists. (Boolean)  
 Sts\_ER - The instruction itself has an error. (Boolean)

Alm\_

Alarm:  
 Alarm indicators to display which actual alarm is occurring. All of these are Booleans.

Rdy\_

Ready:  
 Command ready bits. Booleans determined inside the control routines to reflect whether the routine will allow state change commands.  
 Used with the HMI faceplates to enable or disable command buttons.

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**Execution**

**Condition      Description**

EnableIn is true  
 Prescan

**Revision v2.3 Notes**

- 2.3 - Help File Updates
- 2.2 - ReOrder Sts Tags to reflect numerical TR88 state value
- 2.1 - Enable status added to reflect instruction scan
- 2.0 - AOI name update to reflect PML Model version
- 1.0 - Improved execution scantime
- 09/04/2009 - ETP - Edited Rung 14 to Enable
  - a) Held State IF Holding or UnHolding is Enabled
  - b) Suspended State IF Suspending or UnSuspending is Enabled
  - c) Complete State IF Completing is Enabled

Name	Default	Data Type	Scope
<b>Cfg_DisableStates</b>		DINT[32]	PackMLv3_StateModel
Disable States for Different Modes			
Usage:	InOut Parameter		
Required:	Yes		
Visible:	Yes		
Constant	No		
OPC UA Access:	None		
<i>Cfg_DisableStates - PackMLv3_StateModel/Logic - *35(MOVE), 13(MOVE)</i>			
<b>Cfg_DisableStates[0]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[1]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[2]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[3]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[4]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[5]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[6]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[7]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[8]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[9]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[10]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[11]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[12]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[13]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[14]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[15]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[16]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[17]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[18]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[19]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[20]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[21]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[22]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[23]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[24]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[25]</b>	??	DINT	
Disable States for Different Modes			
<b>Cfg_DisableStates[26]</b>	??	DINT	
Disable States for Different Modes			

<b>Cfg_DisableStates (Continued)</b>		
<b>Cfg_DisableStates[27]</b>	??	DINT
Disable States for Different Modes		
<b>Cfg_DisableStates[28]</b>	??	DINT
Disable States for Different Modes		
<b>Cfg_DisableStates[29]</b>	??	DINT
Disable States for Different Modes		
<b>Cfg_DisableStates[30]</b>	??	DINT
Disable States for Different Modes		
<b>Cfg_DisableStates[31]</b>	??	DINT
Disable States for Different Modes		
<b>Cfg_ModeNames</b>		String_Short[32]
Mode Names		
Usage:	InOut Parameter	
Required:	Yes	
Visible:	Yes	
Constant	No	
OPC UA Access:	None	
<i>Cfg_ModeNames - PackMLv3_StateModel/Logic - 86(COP)</i>		
<b>Cfg_ModeNames[0]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[0].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[0].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[1]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[1].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[1].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[2]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[2].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[2].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[3]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[3].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[3].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[4]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[4].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[4].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[5]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[5].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[5].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[6]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[6].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[6].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[7]</b>	??	String_Short

<b>Cfg_ModeNames (Continued)</b>		
Mode Names		
<b>Cfg_ModeNames[7].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[7].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[8]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[8].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[8].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[9]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[9].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[9].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[10]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[10].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[10].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[11]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[11].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[11].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[12]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[12].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[12].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[13]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[13].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[13].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[14]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[14].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[14].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[15]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[15].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[15].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[16]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[16].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[16].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[17]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[17].LEN</b>	??	DINT

<b>Cfg_ModeNames (Continued)</b>		
Mode Names		
<b>Cfg_ModeNames[17].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[18]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[18].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[18].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[19]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[19].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[19].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[20]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[20].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[20].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[21]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[21].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[21].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[22]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[22].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[22].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[23]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[23].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[23].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[24]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[24].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[24].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[25]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[25].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[25].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[26]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[26].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[26].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[27]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[27].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[27].DATA</b>		SINT

**Cfg\_ModeNames (Continued)**

Mode Names		
<b>Cfg_ModeNames[28]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[28].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[28].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[29]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[29].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[29].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[30]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[30].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[30].DATA</b>		SINT
Mode Names		
<b>Cfg_ModeNames[31]</b>	??	String_Short
Mode Names		
<b>Cfg_ModeNames[31].LEN</b>	??	DINT
Mode Names		
<b>Cfg_ModeNames[31].DATA</b>		SINT
Mode Names		

**Cfg\_ModeTransitions**

DINT[32]

PackMLv3\_StateModel

Acceptable States to Transition Between Modes

Usage: InOut Parameter

Required: Yes

Visible: Yes

Constant: No

OPC UA Access: None

*Cfg\_ModeTransitions - PackMLv3\_StateModel/Logic - \*81(OTL), \*82(OTL), 81(XIO), 82(XIO), 83(XIC), 83(XIC), 84(XIC), 84(XIC)***Cfg\_ModeTransitions[0]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions[1]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions[2]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions[3]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions[4]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions[5]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions[6]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions[7]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions[8]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions[9]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions[10]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions[11]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions[12]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions[13]** ?? DINT

Acceptable States to Transition Between Modes

**Cfg\_ModeTransitions (Continued)**

<b>Cfg_ModeTransitions[14]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[15]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[16]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[17]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[18]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[19]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[20]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[21]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[22]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[23]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[24]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[25]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[26]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[27]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[28]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[29]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[30]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_ModeTransitions[31]</b>	??	DINT	
Acceptable States to Transition Between Modes			
<b>Cfg_RemoteCmdEnable</b>	0	BOOL	PackMLv3_StateModel
Enable Remote Commands			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_RemoteCmdEnable - PackMLv3_StateModel/Logic - 2(XIC)</i>			
<b>Cmd_Abort</b>	0	BOOL	PackMLv3_StateModel
Request that current state transition to Aborting			
Usage:	Input Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cmd_Abort - PackMLv3_StateModel/Logic - 60(XIC)</i>			
<b>Cmd_Clear</b>	0	BOOL	PackMLv3_StateModel
Request that current state transition to Clearing			
Usage:	Input Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read/Write		
OPC UA Access:	None		

**Cmd\_Clear (Continued)***Cmd\_Clear - PackMLv3\_StateModel/Logic - 58(XIC)*

<b>Cmd_Hold</b>	0	BOOL	PackMLv3_StateModel
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Request that current state transition to Holding

Usage: Input Parameter

Required: No

Visible: Yes

External Access: Read/Write

OPC UA Access: None

*Cmd\_Hold - PackMLv3\_StateModel/Logic - 54(XIC)*

<b>Cmd_Mode</b>	0	DINT	PackMLv3_StateModel
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Commanded Mode

Usage: Input Parameter

Required: No

Visible: Yes

External Access: Read/Write

OPC UA Access: None

*Cmd\_Mode - PackMLv3\_StateModel/Logic - \*83(MOVE), \*85(MOVE), 84(LIMIT), 84(MOVE), 84(NE), 84(XIC), 85(NE)**Cmd\_Mode - PackMLv3\_StateModel/Prescan - \*0(MOVE)*

<b>Cmd_Reset</b>	0	BOOL	PackMLv3_StateModel
------------------	---	------	---------------------

Request that current state transition to Resetting

Usage: Input Parameter

Required: No

Visible: Yes

External Access: Read/Write

OPC UA Access: None

*Cmd\_Reset - PackMLv3\_StateModel/Logic - 51(XIC), 52(XIC)*

<b>Cmd_Start</b>	0	BOOL	PackMLv3_StateModel
------------------	---	------	---------------------

Request that current state transition to Starting

Usage: Input Parameter

Required: No

Visible: Yes

External Access: Read/Write

OPC UA Access: None

*Cmd\_Start - PackMLv3\_StateModel/Logic - 53(XIC)*

<b>Cmd_StateComplete</b>	0	BOOL	PackMLv3_StateModel
--------------------------	---	------	---------------------

PackML State Complete Command - Latch Cmd\_StateComplete to allow transition from acting state to wait state

Usage: Input Parameter

Required: No

Visible: Yes

External Access: Read/Write

OPC UA Access: None

*Cmd\_StateComplete - PackMLv3\_StateModel/Logic - 37(XIC), 38(XIO)*

<b>Cmd_Stop</b>	0	BOOL	PackMLv3_StateModel
-----------------	---	------	---------------------

Request that current state transition to Stopping

Usage: Input Parameter

Required: No

Visible: Yes

External Access: Read/Write

OPC UA Access: None

*Cmd\_Stop - PackMLv3\_StateModel/Logic - 59(XIC)*

<b>Cmd_Suspend</b>	0	BOOL	PackMLv3_StateModel
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Request that current state transition to Suspending

Usage: Input Parameter

Required: No

Visible: Yes

**Cmd\_Suspend (Continued)**

External Access: Read/Write  
 OPC UA Access: None

*Cmd\_Suspend - PackMLv3\_StateModel/Logic - 56(XIC)*

**Cmd\_UnHold** 0 BOOL PackMLv3\_StateModel

Request that current state transition to Execute

Usage: Input Parameter

Required: No

Visible: Yes

External Access: Read/Write

OPC UA Access: None

*Cmd\_UnHold - PackMLv3\_StateModel/Logic - 55(XIC)*

**Cmd\_UnSuspend** 0 BOOL PackMLv3\_StateModel

Request that current state transition to Execute

Usage: Input Parameter

Required: No

Visible: Yes

External Access: Read/Write

OPC UA Access: None

*Cmd\_UnSuspend - PackMLv3\_StateModel/Logic - 57(XIC)*

**Inp\_RemoteModeCmd** 0 DINT PackMLv3\_StateModel

Mode Remote Command Interface

Usage: Input Parameter

Required: No

Visible: No

External Access: Read/Write

OPC UA Access: None

*Inp\_RemoteModeCmd - PackMLv3\_StateModel/Logic - 82(OTL), 82(XIO), 83(LIMIT), 83(MOVE), 83(NE), 83(XIC), 85(NE)*

**Inp\_RemoteStateCmd** 0 DINT PackMLv3\_StateModel

State Remote Command Interface

Usage: Input Parameter

Required: No

Visible: No

External Access: Read/Write

OPC UA Access: None

*Inp\_RemoteStateCmd - PackMLv3\_StateModel/Logic - 10(EQ), 11(EQ), 3(EQ), 4(EQ), 5(EQ), 6(EQ), 7(EQ), 8(EQ), 9(EQ)*

**Inp\_RemoteStateCmdChangeRequest** 0 BOOL PackMLv3\_StateModel

State Remote Command Change Request

Usage: Input Parameter

Required: No

Visible: No

External Access: Read/Write

OPC UA Access: None

*Inp\_RemoteStateCmdChangeRequest - PackMLv3\_StateModel/Logic - 2(XIC)*

**Sts\_Aborted** 0 BOOL PackMLv3\_StateModel

The Aborted state is active.

Usage: Output Parameter

Required: No

Visible: Yes

External Access: Read Only

OPC UA Access: None

*Sts\_Aborted - PackMLv3\_StateModel/Logic - \*70(OTE), 70(XIO)*

**Sts\_AbortedEnabled** 0 BOOL PackMLv3\_StateModel

Use of the Aborted state for the current mode is enabled

Usage: Output Parameter

**Sts\_AbortedEnabled (Continued)**

Required: No  
 Visible: No  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_AbortedEnabled - PackMLv3\_StateModel/Logic - \*24(OTE)*

**Sts\_Aborting** 0 BOOL PackMLv3\_StateModel

The Aborting state is active.  
 Usage: Output Parameter  
 Required: No  
 Visible: Yes  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_Aborting - PackMLv3\_StateModel/Logic - \*69(OTE), 69(XIO)*

**Sts\_AbortingEnabled** 0 BOOL PackMLv3\_StateModel

Use of the Aborting state for the current mode is enabled  
 Usage: Output Parameter  
 Required: No  
 Visible: No  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_AbortingEnabled - PackMLv3\_StateModel/Logic - \*23(OTE), 43(XIO)*

**Sts\_Clearing** 0 BOOL PackMLv3\_StateModel

The Clearing state is active.  
 Usage: Output Parameter  
 Required: No  
 Visible: Yes  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_Clearing - PackMLv3\_StateModel/Logic - \*62(OTE), 62(XIO)*

**Sts\_ClearingEnabled** 0 BOOL PackMLv3\_StateModel

Use of the Clearing state for the current mode is enabled  
 Usage: Output Parameter  
 Required: No  
 Visible: No  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_ClearingEnabled - PackMLv3\_StateModel/Logic - \*15(OTE), 39(XIO)*

**Sts\_Complete** 0 BOOL PackMLv3\_StateModel

The Complete state is active.  
 Usage: Output Parameter  
 Required: No  
 Visible: Yes  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_Complete - PackMLv3\_StateModel/Logic - \*78(OTE), 78(XIO)*

**Sts\_CompleteEnabled** 0 BOOL PackMLv3\_StateModel

Use of the Complete state for the current mode is enabled  
 Usage: Output Parameter  
 Required: No  
 Visible: No  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_CompleteEnabled - PackMLv3\_StateModel/Logic - \*34(OTE), 41(XIC), 52(XIO)*

**Sts\_Completing** 0 BOOL PackMLv3\_StateModel

The Completing state is active.

**Sts\_Completing (Continued)**

Usage: Output Parameter  
 Required: No  
 Visible: Yes  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_Completing - PackMLv3\_StateModel/Logic - \*77(O TE), 77(XIO)*

**Sts\_CompletingEnabled** 0 BOOL PackMLv3\_StateModel

Use of the Completing state for the current mode is enabled  
 Usage: Output Parameter  
 Required: No  
 Visible: No  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_CompletingEnabled - PackMLv3\_StateModel/Logic - \*33(O TE), 49(XIO)*

**Sts\_EnabledStates** 0 DINT PackMLv3\_StateModel

Currently Disabled States = 0  
 Usage: Output Parameter  
 Required: No  
 Visible: No  
 External Access: Read Only  
 OPC UA Access: None

**Sts\_EnabledStates.1** 0 BOOL

Currently Disabled States = 0  
*Sts\_EnabledStates.1 - PackMLv3\_StateModel/Logic - \*15(O TE)*

**Sts\_EnabledStates.2** 0 BOOL

Currently Disabled States = 0  
*Sts\_EnabledStates.2 - PackMLv3\_StateModel/Logic - \*16(O TE)*

**Sts\_EnabledStates.3** 0 BOOL

Currently Disabled States = 0  
*Sts\_EnabledStates.3 - PackMLv3\_StateModel/Logic - \*17(O TE)*

**Sts\_EnabledStates.4** 0 BOOL

Currently Disabled States = 0  
*Sts\_EnabledStates.4 - PackMLv3\_StateModel/Logic - \*18(O TE)*

**Sts\_EnabledStates.5** 0 BOOL

Currently Disabled States = 0  
*Sts\_EnabledStates.5 - PackMLv3\_StateModel/Logic - \*20(O TE)*

**Sts\_EnabledStates.6** 0 BOOL

Currently Disabled States = 0  
*Sts\_EnabledStates.6 - PackMLv3\_StateModel/Logic - \*21(O TE)*

**Sts\_EnabledStates.7** 0 BOOL

Currently Disabled States = 0  
*Sts\_EnabledStates.7 - PackMLv3\_StateModel/Logic - \*22(O TE)*

**Sts\_EnabledStates.8** 0 BOOL

Currently Disabled States = 0  
*Sts\_EnabledStates.8 - PackMLv3\_StateModel/Logic - \*23(O TE)*

**Sts\_EnabledStates.9** 0 BOOL

Currently Disabled States = 0  
*Sts\_EnabledStates.9 - PackMLv3\_StateModel/Logic - \*24(O TE)*

**Sts\_EnabledStates.10** 0 BOOL

Currently Disabled States = 0  
*Sts\_EnabledStates.10 - PackMLv3\_StateModel/Logic - \*26(O TE)*

**Sts\_EnabledStates.11** 0 BOOL

Currently Disabled States = 0  
*Sts\_EnabledStates.11 - PackMLv3\_StateModel/Logic - \*27(O TE)*

**Sts\_EnabledStates.12** 0 BOOL

Currently Disabled States = 0  
*Sts\_EnabledStates.12 - PackMLv3\_StateModel/Logic - \*28(O TE)*

**Sts\_EnabledStates.13** 0 BOOL

Currently Disabled States = 0  
*Sts\_EnabledStates.13 - PackMLv3\_StateModel/Logic - \*29(O TE)*

<b>Sts_EnabledStates (Continued)</b>			
<b>Sts_EnabledStates.14</b>	0	BOOL	
Currently Disabled States = 0			
<i>Sts_EnabledStates.14 - PackMLv3_StateModel/Logic - *30(OTE)</i>			
<b>Sts_EnabledStates.15</b>	0	BOOL	
Currently Disabled States = 0			
<i>Sts_EnabledStates.15 - PackMLv3_StateModel/Logic - *31(OTE)</i>			
<b>Sts_EnabledStates.16</b>	0	BOOL	
Currently Disabled States = 0			
<i>Sts_EnabledStates.16 - PackMLv3_StateModel/Logic - *33(OTE)</i>			
<b>Sts_EnabledStates.17</b>	0	BOOL	
Currently Disabled States = 0			
<i>Sts_EnabledStates.17 - PackMLv3_StateModel/Logic - *34(OTE)</i>			
<b>Sts_Execute</b>	0	BOOL	PackMLv3_StateModel
The Execute state is active.			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_Execute - PackMLv3_StateModel/Logic - *67(OTE), 67(XIO)</i>			
<b>Sts_ExecuteEnabled</b>	0	BOOL	PackMLv3_StateModel
Use of the Execute state for the current mode is enabled			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_ExecuteEnabled - PackMLv3_StateModel/Logic - *21(OTE)</i>			
<b>Sts_Held</b>	0	BOOL	PackMLv3_StateModel
The Held state is active.			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_Held - PackMLv3_StateModel/Logic - *72(OTE), 72(XIO)</i>			
<b>Sts_HeldEnabled</b>	0	BOOL	PackMLv3_StateModel
Use of the Held state for the current mode is enabled			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_HeldEnabled - PackMLv3_StateModel/Logic - *27(OTE), 54(XIC)</i>			
<b>Sts_Holding</b>	0	BOOL	PackMLv3_StateModel
The Holding state is active.			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_Holding - PackMLv3_StateModel/Logic - *71(OTE), 71(XIO)</i>			
<b>Sts_HoldingEnabled</b>	0	BOOL	PackMLv3_StateModel
Use of the Holding state for the current mode is enabled			
Usage:	Output Parameter		
Required:	No		

<b>Sts_HoldingEnabled (Continued)</b>			
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_HoldingEnabled - PackMLv3_StateModel/Logic - *26(OTE), 44(XIO)</i>			
<b>Sts_Idle</b>	0	BOOL	PackMLv3_StateModel
The Idle state is active.			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_Idle - PackMLv3_StateModel/Logic - *65(OTE), 65(XIO)</i>			
<b>Sts_IdleEnabled</b>	0	BOOL	PackMLv3_StateModel
Use of the Idle state for the current mode is enabled			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_IdleEnabled - PackMLv3_StateModel/Logic - *18(OTE), 53(XIO)</i>			
<b>Sts_ModeChangeNotAllowed</b>	0	BOOL	PackMLv3_StateModel
Mode Change Request Was Denied			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_ModeChangeNotAllowed - PackMLv3_StateModel/Logic - *85(OTE)</i>			
<b>Sts_ModeCurrent</b>	0	DINT	PackMLv3_StateModel
Current Mode ID			
Usage:	Output Parameter		
Required:	No		
Visible:	No		
External Access:	Read Only		
OPC UA Access:	None		
<i>Sts_ModeCurrent - PackMLv3_StateModel/Logic - *83(MOVE), *84(MOVE), 13(MOVE), 35(MOVE), 81(OTL), 81(XIO), 83(MOVE), 83(NE), 83(XIC), 84(NE), 84(XIC), 85(MOVE), 85(NE), 85(NE), 86(COP)</i>			
<i>Sts_ModeCurrent - PackMLv3_StateModel/Prescan - *0(MOVE)</i>			
<b>Sts_ModeCurrentName</b>	??	String_Short	PackMLv3_StateModel
Current Mode Name			
Usage:	InOut Parameter		
Required:	Yes		
Visible:	Yes		
Constant	No		
OPC UA Access:	None		
<i>Sts_ModeCurrentName - PackMLv3_StateModel/Logic - *86(COP)</i>			
<b>Sts_ModeCurrentName.LEN</b>	??	DINT	
Current Mode Name			
<b>Sts_ModeCurrentName.DATA</b>		SINT	
Current Mode Name			
<b>Sts_Resetting</b>	0	BOOL	PackMLv3_StateModel
The Resetting state is active.			
Usage:	Output Parameter		
Required:	No		
Visible:	Yes		
External Access:	Read Only		

**Sts\_Resetting (Continued)**

OPC UA Access: None  
*Sts\_Resetting - PackMLv3\_StateModel/Logic - \*76(O TE), 76(XIO)*

**Sts\_ResettingEnabled** 0 BOOL PackMLv3\_StateModel

Use of the Resetting state for the current mode is enabled  
 Usage: Output Parameter  
 Required: No  
 Visible: No  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_ResettingEnabled - PackMLv3\_StateModel/Logic - \*31(O TE), 48(XIO)*

**Sts\_Starting** 0 BOOL PackMLv3\_StateModel

The Starting state is active.  
 Usage: Output Parameter  
 Required: No  
 Visible: Yes  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_Starting - PackMLv3\_StateModel/Logic - \*64(O TE), 64(XIO)*

**Sts\_StartingEnabled** 0 BOOL PackMLv3\_StateModel

Use of the Starting state for the current mode is enabled  
 Usage: Output Parameter  
 Required: No  
 Visible: No  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_StartingEnabled - PackMLv3\_StateModel/Logic - \*17(O TE), 40(XIO)*

**Sts\_StateCurrent** 0 DINT PackMLv3\_StateModel

Current State ID  
 Usage: Output Parameter  
 Required: No  
 Visible: No  
 External Access: Read Only  
 OPC UA Access: None  
*Sts\_StateCurrent - PackMLv3\_StateModel/Logic - \*62(MOVE), \*63(MOVE), \*64(MOVE), \*65(MOVE), \*66(MOVE), \*67(MOVE), \*68(MOVE), \*69(MOVE), \*70(MOVE), \*71(MOVE), \*72(MOVE), \*73(MOVE), \*74(MOVE), \*75(MOVE), \*76(MOVE), \*77(MOVE), \*78(MOVE), 83(XIC), 83(XIC), 84(XIC), 84(XIC)*  
*Sts\_StateCurrent - PackMLv3\_StateModel/Prescan - \*1(MOVE)*

**Sts\_StateCurrentName** ?? String\_Short PackMLv3\_StateModel

Current State Name  
 Usage: InOut Parameter  
 Required: Yes  
 Visible: Yes  
 Constant: No  
 OPC UA Access: None  
*Sts\_StateCurrentName - PackMLv3\_StateModel/Logic - \*62(COP), \*63(COP), \*64(COP), \*65(COP), \*66(COP), \*67(COP), \*68(COP), \*69(COP), \*70(COP), \*71(COP), \*72(COP), \*73(COP), \*74(COP), \*75(COP), \*76(COP), \*77(COP), \*78(COP)*

**Sts\_StateCurrentName.LEN** ?? DINT

Current State Name

**Sts\_StateCurrentName.DATA** SINT

Current State Name

**Sts\_Stopped** 0 BOOL PackMLv3\_StateModel

The Stopped state is active.  
 Usage: Output Parameter  
 Required: No  
 Visible: Yes  
 External Access: Read Only

**Sts\_Stopped (Continued)**

OPC UA Access: None  
*Sts\_Stopped - PackMLv3\_StateModel/Logic - \*63(O TE), 63(XIO)*

**Sts\_StoppedEnabled** 0 BOOL PackMLv3\_StateModel

Use of the Stopped state for the current mode is enabled

Usage: Output Parameter

Required: No

Visible: No

External Access: Read Only

OPC UA Access: None

*Sts\_StoppedEnabled - PackMLv3\_StateModel/Logic - \*16(O TE)*

**Sts\_Stopping** 0 BOOL PackMLv3\_StateModel

The Stopping state is active.

Usage: Output Parameter

Required: No

Visible: Yes

External Access: Read Only

OPC UA Access: None

*Sts\_Stopping - PackMLv3\_StateModel/Logic - \*68(O TE), 68(XIO)*

**Sts\_StoppingEnabled** 0 BOOL PackMLv3\_StateModel

Use of the Stopping state for the current mode is enabled

Usage: Output Parameter

Required: No

Visible: No

External Access: Read Only

OPC UA Access: None

*Sts\_StoppingEnabled - PackMLv3\_StateModel/Logic - \*22(O TE), 42(XIO)*

**Sts\_Suspended** 0 BOOL PackMLv3\_StateModel

The Suspended state is active.

Usage: Output Parameter

Required: No

Visible: Yes

External Access: Read Only

OPC UA Access: None

*Sts\_Suspended - PackMLv3\_StateModel/Logic - \*66(O TE), 66(XIO)*

**Sts\_SuspendedEnabled** 0 BOOL PackMLv3\_StateModel

Use of the Suspended state for the current mode is enabled

Usage: Output Parameter

Required: No

Visible: No

External Access: Read Only

OPC UA Access: None

*Sts\_SuspendedEnabled - PackMLv3\_StateModel/Logic - \*20(O TE), 56(XIC)*

**Sts\_Suspending** 0 BOOL PackMLv3\_StateModel

The Suspending state is active.

Usage: Output Parameter

Required: No

Visible: Yes

External Access: Read Only

OPC UA Access: None

*Sts\_Suspending - PackMLv3\_StateModel/Logic - \*74(O TE), 74(XIO)*

**Sts\_SuspendingEnabled** 0 BOOL PackMLv3\_StateModel

Use of the Suspending state for the current mode is enabled

Usage: Output Parameter

Required: No

Visible: No

**Sts\_SuspendingEnabled (Continued)**

External Access: Read Only  
 OPC UA Access: None

*Sts\_SuspendingEnabled - PackMLv3\_StateModel/Logic - \*29(O TE), 46(XIO)*

**Sts\_UnHolding** 0 BOOL PackMLv3\_StateModel

The UnHolding state is active.

Usage: Output Parameter

Required: No

Visible: Yes

External Access: Read Only

OPC UA Access: None

*Sts\_UnHolding - PackMLv3\_StateModel/Logic - \*73(O TE), 73(XIO)*

**Sts\_UnHoldingEnabled** 0 BOOL PackMLv3\_StateModel

Use of the UnHolding state for the current mode is enabled

Usage: Output Parameter

Required: No

Visible: No

External Access: Read Only

OPC UA Access: None

*Sts\_UnHoldingEnabled - PackMLv3\_StateModel/Logic - \*28(O TE), 45(XIO)*

**Sts\_UnSuspending** 0 BOOL PackMLv3\_StateModel

The UnSuspending state is active.

Usage: Output Parameter

Required: No

Visible: Yes

External Access: Read Only

OPC UA Access: None

*Sts\_UnSuspending - PackMLv3\_StateModel/Logic - \*75(O TE), 75(XIO)*

**Sts\_UnSuspendingEnabled** 0 BOOL PackMLv3\_StateModel

Use of the UnSuspending state for the current mode is enabled

Usage: Output Parameter

Required: No

Visible: No

External Access: Read Only

OPC UA Access: None

*Sts\_UnSuspendingEnabled - PackMLv3\_StateModel/Logic - \*30(O TE), 47(XIO)*

Name	Default	Data Type	Scope
<b>AbortRemoteCmd</b>	0	BOOL	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>AbortRemoteCmd - PackMLv3_StateModel/Logic - *10(OTE), 60(XIC)</i>			
<b>Cfg_DisableStatesCopy</b>	0	DINT	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>Cfg_DisableStatesCopy - PackMLv3_StateModel/Logic - *13(MOVE), 35(MOVE)</i>			
<b>Cfg_DisableStatesCopy.0</b>	0	BOOL	
No State Associated			
<b>Cfg_DisableStatesCopy.1</b>	0	BOOL	
Clearing State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.1 - PackMLv3_StateModel/Logic - 15(XIO)</i>			
<b>Cfg_DisableStatesCopy.2</b>	0	BOOL	
Stopped State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.2 - PackMLv3_StateModel/Logic - *14(OTU), 14(XIC), 16(XIO)</i>			
<b>Cfg_DisableStatesCopy.3</b>	0	BOOL	
Starting State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.3 - PackMLv3_StateModel/Logic - 17(XIO)</i>			
<b>Cfg_DisableStatesCopy.4</b>	0	BOOL	
Idle State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.4 - PackMLv3_StateModel/Logic - 18(XIO)</i>			
<b>Cfg_DisableStatesCopy.5</b>	0	BOOL	
Suspended State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.5 - PackMLv3_StateModel/Logic - 19(XIC), 20(XIO)</i>			
<b>Cfg_DisableStatesCopy.6</b>	0	BOOL	
Execute State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.6 - PackMLv3_StateModel/Logic - *14(OTU), 14(XIC), 21(XIO)</i>			
<b>Cfg_DisableStatesCopy.7</b>	0	BOOL	
Stopping State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.7 - PackMLv3_StateModel/Logic - 22(XIO)</i>			
<b>Cfg_DisableStatesCopy.8</b>	0	BOOL	
Aborting State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.8 - PackMLv3_StateModel/Logic - 23(XIO)</i>			
<b>Cfg_DisableStatesCopy.9</b>	0	BOOL	
Aborted State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.9 - PackMLv3_StateModel/Logic - *14(OTU), 14(XIC), 24(XIO)</i>			
<b>Cfg_DisableStatesCopy.10</b>	0	BOOL	
Holding State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.10 - PackMLv3_StateModel/Logic - *25(OTL), 26(XIO)</i>			
<b>Cfg_DisableStatesCopy.11</b>	0	BOOL	
Held State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.11 - PackMLv3_StateModel/Logic - 25(XIC), 27(XIO)</i>			
<b>Cfg_DisableStatesCopy.12</b>	0	BOOL	
UnHolding State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.12 - PackMLv3_StateModel/Logic - *25(OTL), 28(XIO)</i>			
<b>Cfg_DisableStatesCopy.13</b>	0	BOOL	
Suspending State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.13 - PackMLv3_StateModel/Logic - *19(OTL), 29(XIO)</i>			
<b>Cfg_DisableStatesCopy.14</b>	0	BOOL	
UnSuspending State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.14 - PackMLv3_StateModel/Logic - *19(OTL), 30(XIO)</i>			
<b>Cfg_DisableStatesCopy.15</b>	0	BOOL	
Resetting State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.15 - PackMLv3_StateModel/Logic - 31(XIO)</i>			
<b>Cfg_DisableStatesCopy.16</b>	0	BOOL	
Completing State 1 = Disabled State			
<i>Cfg_DisableStatesCopy.16 - PackMLv3_StateModel/Logic - *32(OTL), 33(XIO)</i>			
<b>Cfg_DisableStatesCopy.17</b>	0	BOOL	

**Cfg\_DisableStatesCopy (Continued)**

Complete State 1 = Disabled State

*Cfg\_DisableStatesCopy.17 - PackMLv3\_StateModel/Logic - 32(XIC), 34(XIO)***ClearRemoteCmd** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*ClearRemoteCmd - PackMLv3\_StateModel/Logic - \*11(OTE), 58(XIC)***HoldRemoteCmd** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*HoldRemoteCmd - PackMLv3\_StateModel/Logic - \*6(OTE), 54(XIC)***LocalAborted** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalAborted - PackMLv3\_StateModel/Logic - \*43(OTL), \*58(OTU), 58(XIC), 70(XIC)**LocalAborted - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalAborting** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalAborting - PackMLv3\_StateModel/Logic - \*43(OTU), \*60(OTL), 43(XIC), 69(XIC)**LocalAborting - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalClearing** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalClearing - PackMLv3\_StateModel/Logic - \*39(OTU), \*58(OTL), \*60(OTU), 39(XIC), 60(XIC), 62(XIC)**LocalClearing - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalComplete** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalComplete - PackMLv3\_StateModel/Logic - \*49(OTL), \*52(OTU), \*59(OTU), \*60(OTU), 52(XIC), 59(XIC), 60(XIC), 78(XIC)**LocalComplete - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalCompleting** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalCompleting - PackMLv3\_StateModel/Logic - \*41(OTL), \*49(OTU), \*59(OTU), \*60(OTU), 49(XIC), 59(XIC), 60(XIC), 77(XIC)**LocalCompleting - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalExecute** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalExecute - PackMLv3\_StateModel/Logic - \*40(OTL), \*41(OTU), \*45(OTL), \*47(OTL), \*54(OTU), \*56(OTU), \*59(OTU), \*60(OTU), 41(XIC), 54(XIC), 56(XIC), 59(XIC), 60(XIC), 67(XIC)**LocalExecute - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalHeld** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

**LocalHeld (Continued)***LocalHeld - PackMLv3\_StateModel/Logic - \*44(OTL), \*55(OTU), \*59(OTU), \*60(OTU), 55(XIC), 59(XIC), 60(XIC), 72(XIC)**LocalHeld - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalHolding** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalHolding - PackMLv3\_StateModel/Logic - \*44(OTU), \*54(OTL), \*59(OTU), \*60(OTU), 44(XIC), 59(XIC), 60(XIC), 71(XIC)**LocalHolding - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalIdle** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalIdle - PackMLv3\_StateModel/Logic - \*48(OTL), \*53(OTU), \*59(OTU), \*60(OTU), 53(XIC), 59(XIC), 60(XIC), 65(XIC)**LocalIdle - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalResetting** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalResetting - PackMLv3\_StateModel/Logic - \*48(OTU), \*51(OTL), \*52(OTL), \*59(OTU), \*60(OTU), 48(XIC), 59(XIC), 60(XIC), 76(XIC)**LocalResetting - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalStarting** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalStarting - PackMLv3\_StateModel/Logic - \*40(OTU), \*53(OTL), \*59(OTU), \*60(OTU), 40(XIC), 59(XIC), 60(XIC), 64(XIC)**LocalStarting - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalStopped** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalStopped - PackMLv3\_StateModel/Logic - \*39(OTL), \*42(OTL), \*51(OTU), \*60(OTU), 51(XIC), 60(XIC), 63(XIC)**LocalStopped - PackMLv3\_StateModel/Prescan - \*1(OTL)***LocalStopping** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalStopping - PackMLv3\_StateModel/Logic - \*42(OTU), \*59(OTL), \*60(OTU), 42(XIC), 60(XIC), 68(XIC)**LocalStopping - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalSuspended** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalSuspended - PackMLv3\_StateModel/Logic - \*46(OTL), \*57(OTU), \*59(OTU), \*60(OTU), 57(XIC), 59(XIC), 60(XIC), 66(XIC)**LocalSuspended - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalSuspending** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

OPC UA Access: None

*LocalSuspending - PackMLv3\_StateModel/Logic - \*46(OTU), \*56(OTL), \*59(OTU), \*60(OTU), 46(XIC), 59(XIC), 60(XIC), 74(XIC)**LocalSuspending - PackMLv3\_StateModel/Prescan - \*1(OTU)***LocalUnHolding** 0 BOOL PackMLv3\_StateModel

Usage: Local Tag

External Access: Read/Write

**LocalUnHolding (Continued)**

OPC UA Access: None  
*LocalUnHolding - PackMLv3\_StateModel/Logic - \*45(OTU), \*55(OTL), \*59(OTU), \*60(OTU), 45(XIC), 59(XIC), 60(XIC), 73(XIC)*  
*LocalUnHolding - PackMLv3\_StateModel/Prescan - \*1(OTU)*

**LocalUnSuspending**

0 BOOL PackMLv3\_StateModel  
 Usage: Local Tag  
 External Access: Read/Write  
 OPC UA Access: None  
*LocalUnSuspending - PackMLv3\_StateModel/Logic - \*47(OTU), \*57(OTL), \*59(OTU), \*60(OTU), 47(XIC), 59(XIC), 60(XIC), 75(XIC)*  
*LocalUnSuspending - PackMLv3\_StateModel/Prescan - \*1(OTU)*

**PreviousMode**

0 DINT PackMLv3\_StateModel  
 Usage: Local Tag  
 External Access: Read/Write  
 OPC UA Access: None  
*PreviousMode - PackMLv3\_StateModel/Prescan - \*0(CLR)*

**RemoteCmdChangeRequested**

0 BOOL PackMLv3\_StateModel  
 Usage: Local Tag  
 External Access: Read/Write  
 OPC UA Access: None  
*RemoteCmdChangeRequested - PackMLv3\_StateModel/Logic - \*2(OTE), 10(XIC), 11(XIC), 3(XIC), 4(XIC), 5(XIC), 6(XIC), 7(XIC), 8(XIC), 83(XIC), 85(XIC), 9(XIC)*

**ResetRemoteCmd**

0 BOOL PackMLv3\_StateModel  
 Usage: Local Tag  
 External Access: Read/Write  
 OPC UA Access: None  
*ResetRemoteCmd - PackMLv3\_StateModel/Logic - \*3(OTE), 51(XIC), 52(XIC)*

**StartRemoteCmd**

0 BOOL PackMLv3\_StateModel  
 Usage: Local Tag  
 External Access: Read/Write  
 OPC UA Access: None  
*StartRemoteCmd - PackMLv3\_StateModel/Logic - \*4(OTE), 53(XIC)*

**StateComplete**

0 BOOL PackMLv3\_StateModel  
 Usage: Local Tag  
 External Access: Read/Write  
 OPC UA Access: None  
*StateComplete - PackMLv3\_StateModel/Logic - \*37(OTL), \*38(OTU), \*39(OTU), \*40(OTU), \*41(OTU), \*42(OTU), \*43(OTU), \*44(OTU), \*45(OTU), \*46(OTU), \*47(OTU), \*48(OTU), \*49(OTU), 39(XIC), 40(XIC), 41(XIC), 42(XIC), 43(XIC), 44(XIC), 45(XIC), 46(XIC), 47(XIC), 48(XIC), 49(XIC)*

**StopRemoteCmd**

0 BOOL PackMLv3\_StateModel  
 Usage: Local Tag  
 External Access: Read/Write  
 OPC UA Access: None  
*StopRemoteCmd - PackMLv3\_StateModel/Logic - \*5(OTE), 59(XIC)*

**StringAborted**

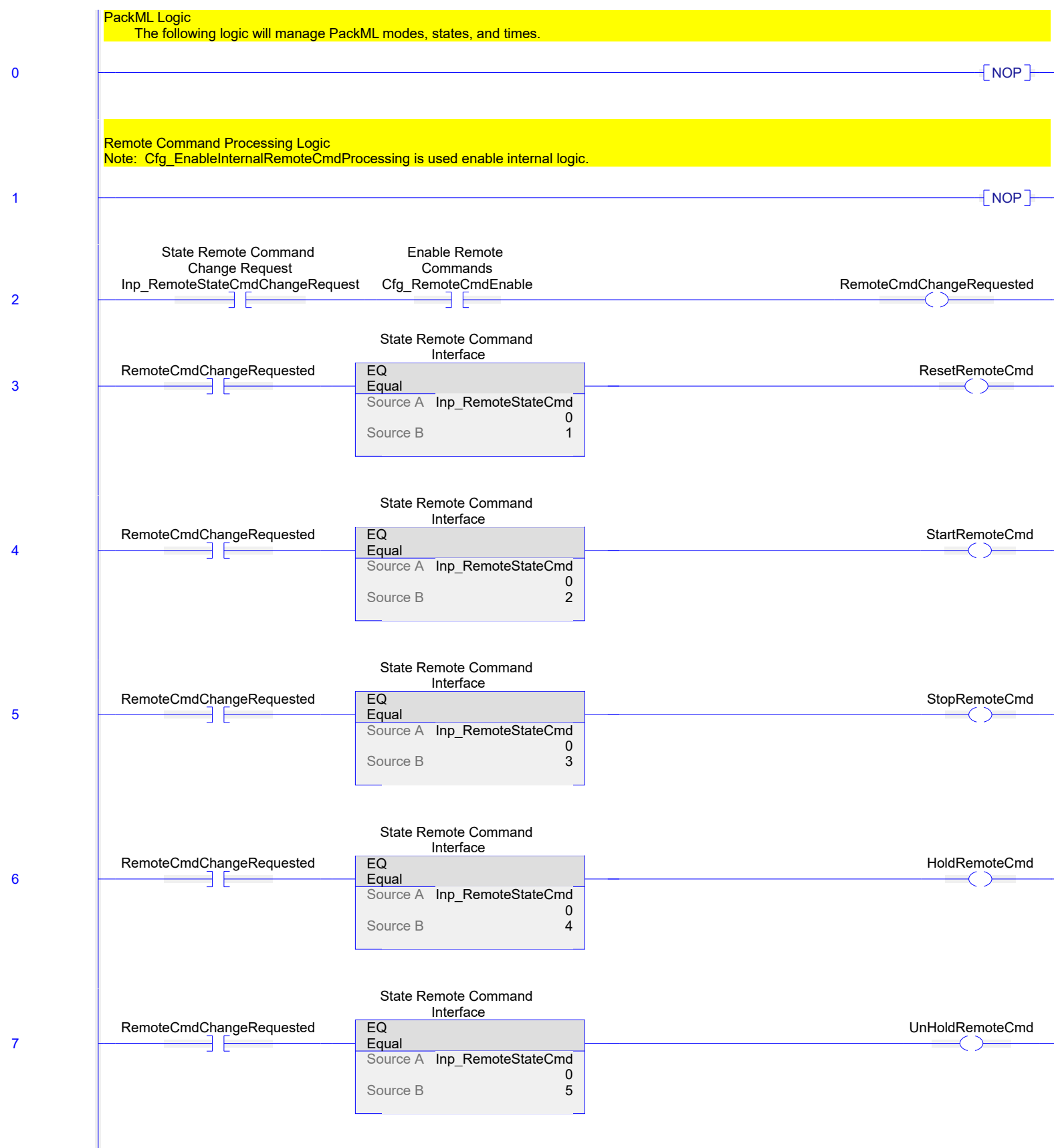
'Aborted' String\_Short PackMLv3\_StateModel  
 Usage: Local Tag  
 External Access: Read/Write  
 OPC UA Access: None  
*StringAborted - PackMLv3\_StateModel/Logic - 70(COP)*

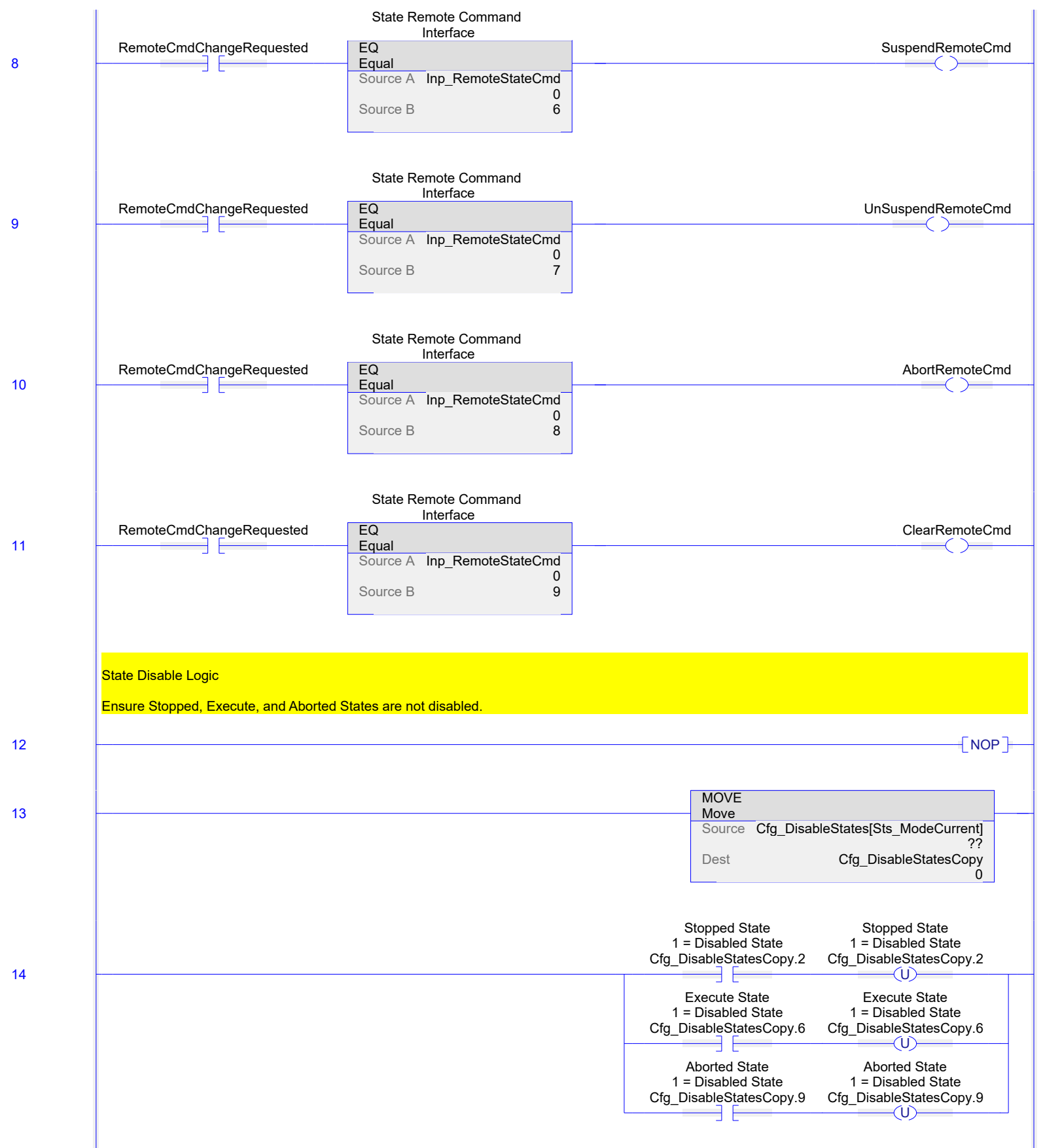
**StringAborting**

'Aborting' String\_Short PackMLv3\_StateModel  
 Usage: Local Tag  
 External Access: Read/Write  
 OPC UA Access: None  
*StringAborting - PackMLv3\_StateModel/Logic - 69(COP)*

<b>StringClearing</b>	'Clearing'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringClearing - PackMLv3_StateModel/Logic - 62(COP)</i>			
<b>StringComplete</b>	'Complete'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringComplete - PackMLv3_StateModel/Logic - 78(COP)</i>			
<b>StringCompleting</b>	'Completing'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringCompleting - PackMLv3_StateModel/Logic - 77(COP)</i>			
<b>StringExecute</b>	'Execute'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringExecute - PackMLv3_StateModel/Logic - 67(COP)</i>			
<b>StringHeld</b>	'Held'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringHeld - PackMLv3_StateModel/Logic - 72(COP)</i>			
<b>StringHolding</b>	'Holding'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringHolding - PackMLv3_StateModel/Logic - 71(COP)</i>			
<b>StringIdle</b>	'Idle'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringIdle - PackMLv3_StateModel/Logic - 65(COP)</i>			
<b>StringResetting</b>	'Resetting'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringResetting - PackMLv3_StateModel/Logic - 76(COP)</i>			
<b>StringStarting</b>	'Starting'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringStarting - PackMLv3_StateModel/Logic - 64(COP)</i>			
<b>StringStopped</b>	'Stopped'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringStopped - PackMLv3_StateModel/Logic - 63(COP)</i>			
<b>StringStopping</b>	'Stopping'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		

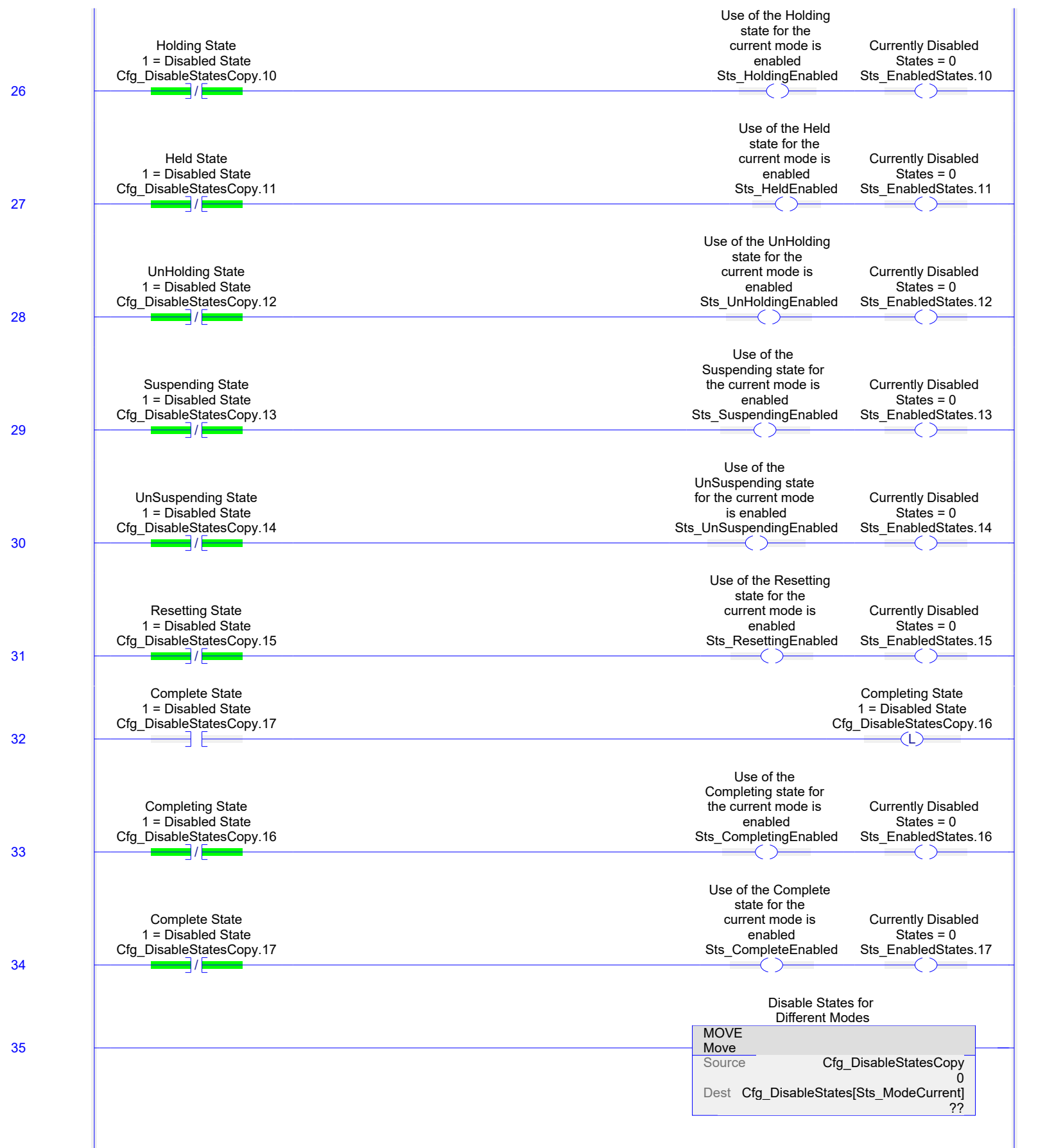
<b>StringStopping (Continued)</b>			
OPC UA Access:	None		
<i>StringStopping - PackMLv3_StateModel/Logic - 68(COP)</i>			
<b>StringSuspended</b>	'Suspended'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringSuspended - PackMLv3_StateModel/Logic - 66(COP)</i>			
<b>StringSuspending</b>	'Suspending'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringSuspending - PackMLv3_StateModel/Logic - 74(COP)</i>			
<b>StringUnHolding</b>	'UnHolding'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringUnHolding - PackMLv3_StateModel/Logic - 73(COP)</i>			
<b>StringUnSuspending</b>	'UnSuspending'	String_Short	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>StringUnSuspending - PackMLv3_StateModel/Logic - 75(COP)</i>			
<b>SuspendRemoteCmd</b>	0	BOOL	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>SuspendRemoteCmd - PackMLv3_StateModel/Logic - *8(OTE), 56(XIC)</i>			
<b>TON_ModeChangeNotAllowed</b>		TIMER	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>TON_ModeChangeNotAllowed - PackMLv3_StateModel/Logic - *85(TON)</i>			
<b>TON_ModeChangeNotAllowed.PRE</b>	3000	DINT	
<i>TON_ModeChangeNotAllowed.PRE - PackMLv3_StateModel/Prescan - *2(MOVE)</i>			
<b>TON_ModeChangeNotAllowed.DN</b>	0	BOOL	
<i>TON_ModeChangeNotAllowed.DN - PackMLv3_StateModel/Logic - 85(XIC)</i>			
<b>UnHoldRemoteCmd</b>	0	BOOL	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>UnHoldRemoteCmd - PackMLv3_StateModel/Logic - *7(OTE), 55(XIC)</i>			
<b>UnSuspendRemoteCmd</b>	0	BOOL	PackMLv3_StateModel
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		
<i>UnSuspendRemoteCmd - PackMLv3_StateModel/Logic - *9(OTE), 57(XIC)</i>			



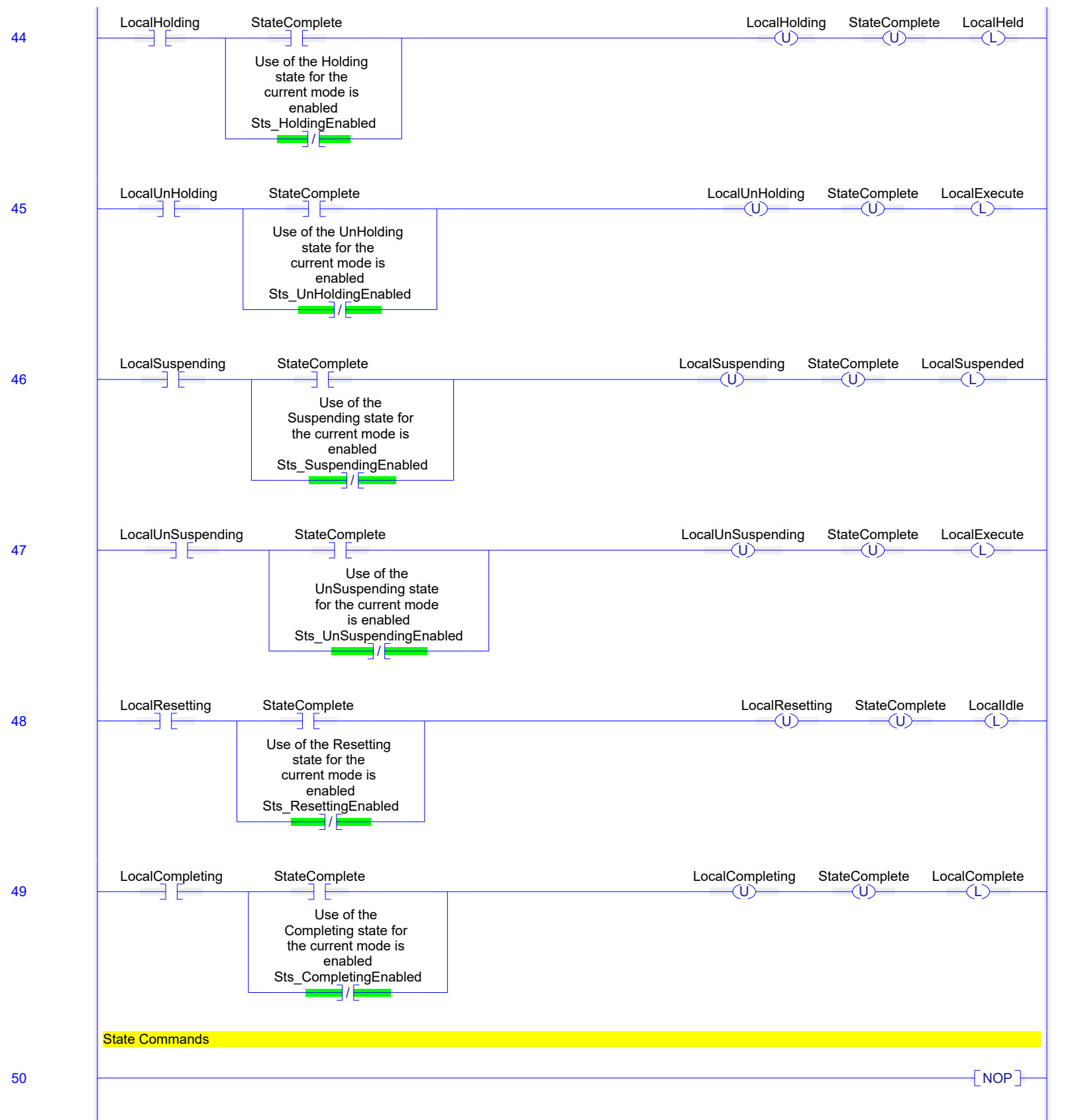


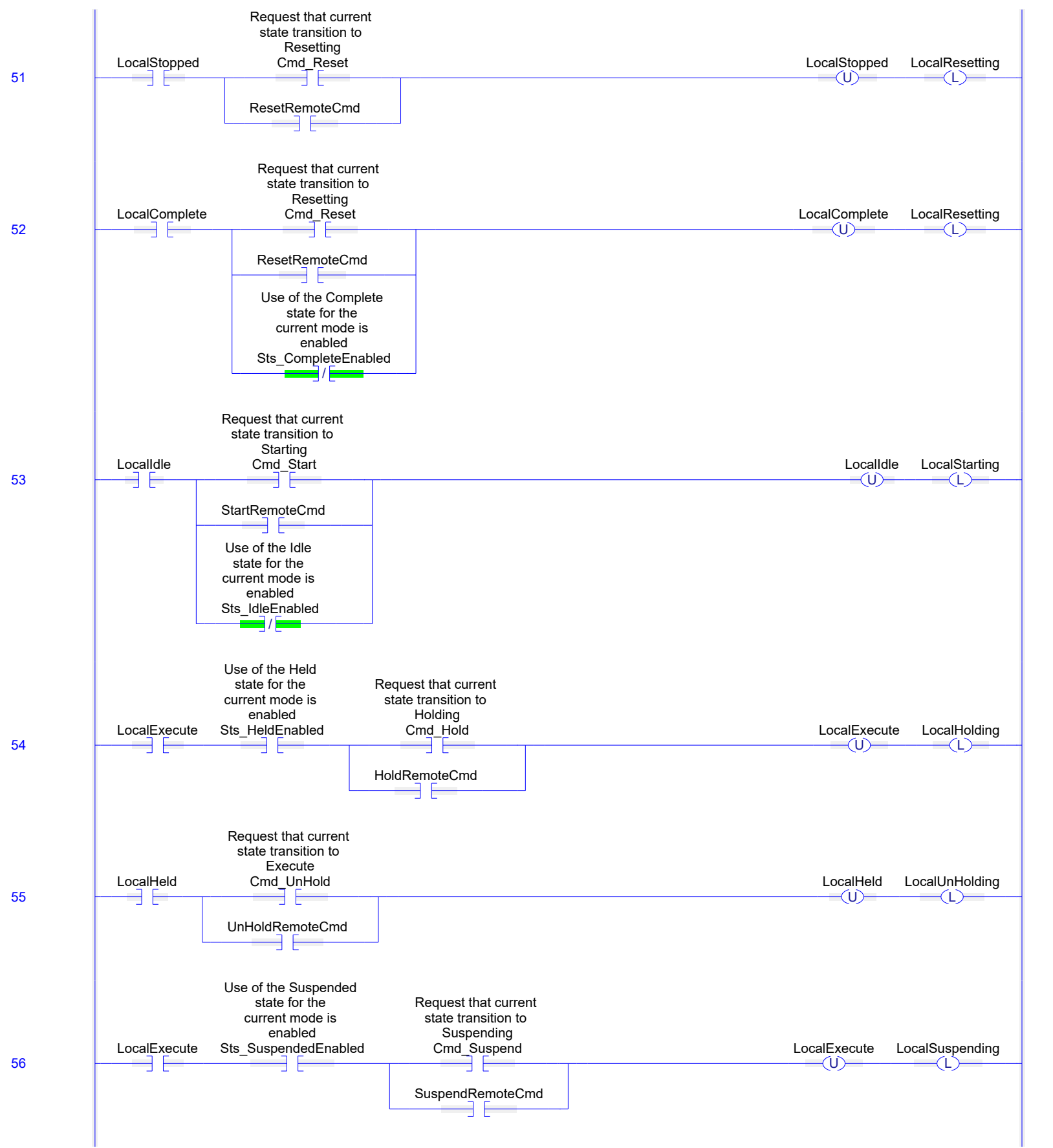
**State Disable Logic**  
 Ensure Stopped, Execute, and Aborted States are not disabled.

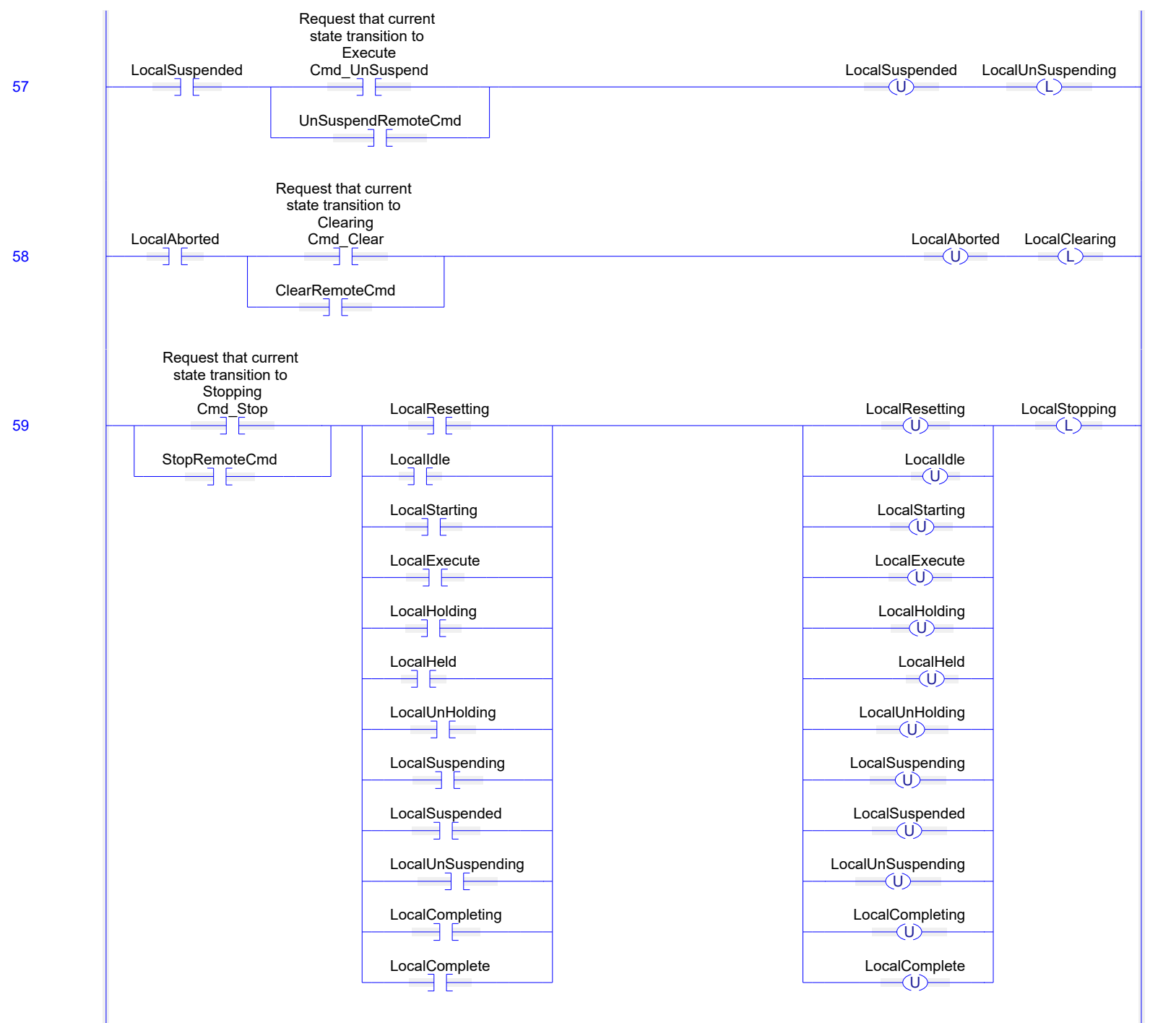


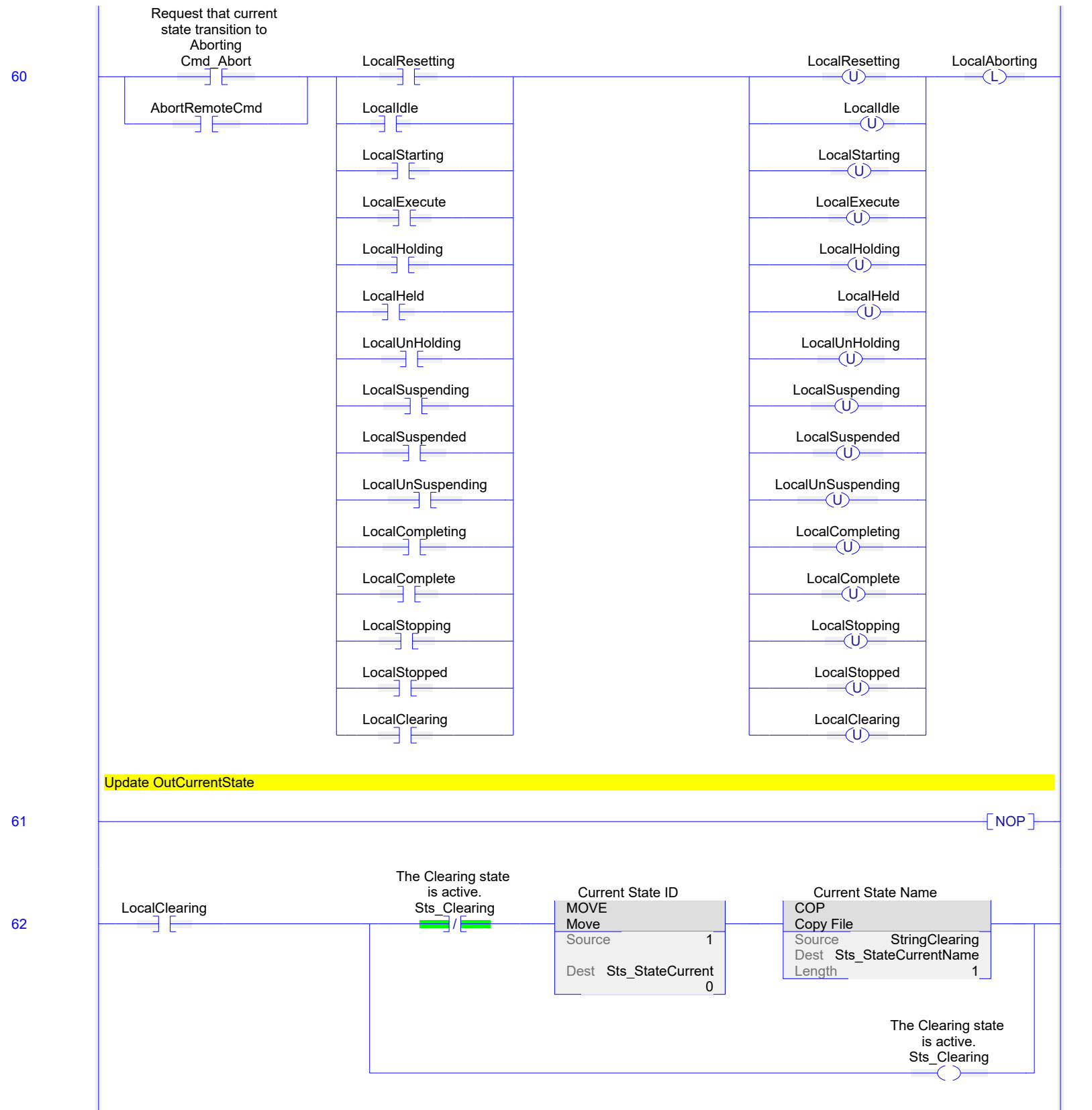


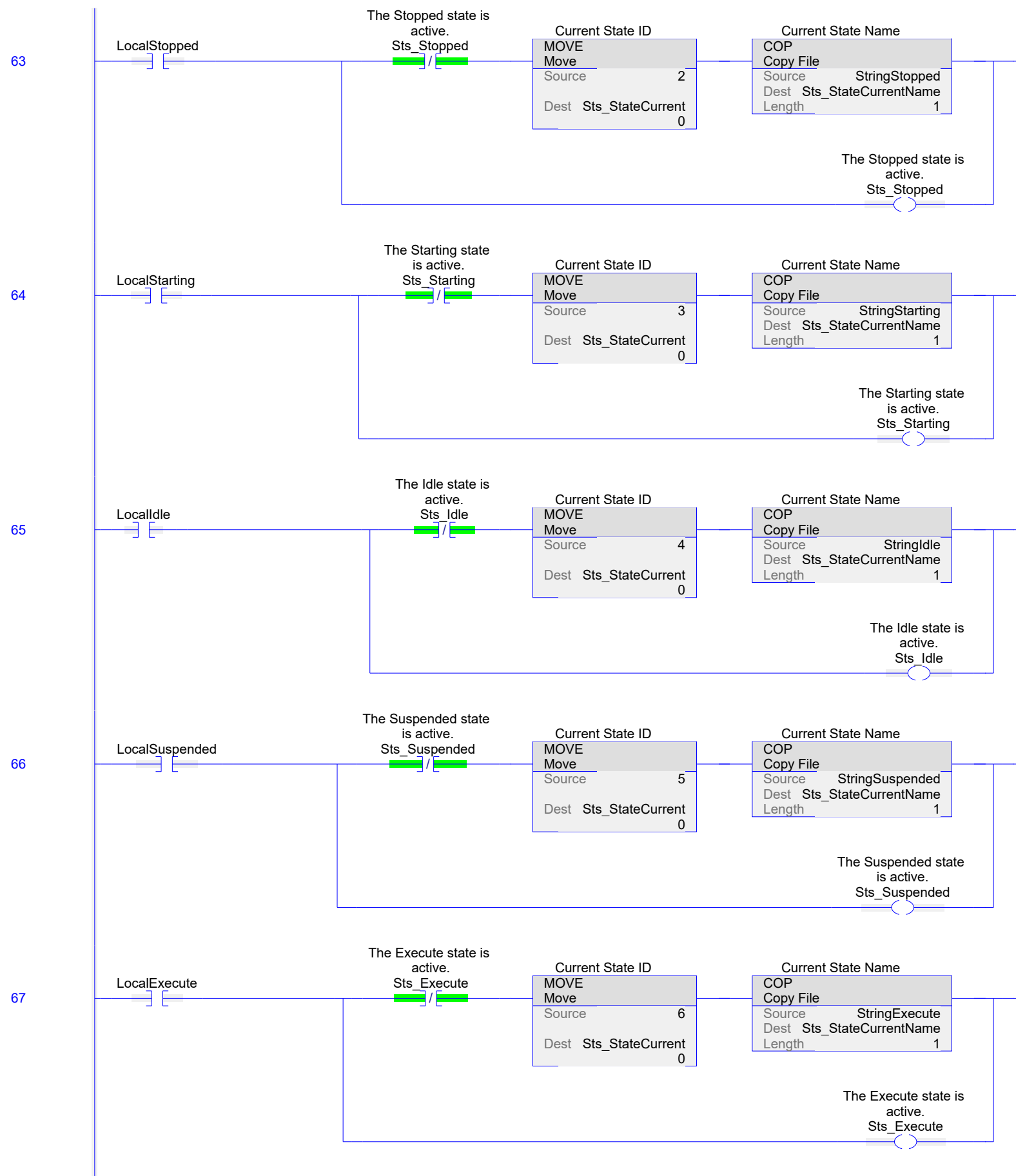


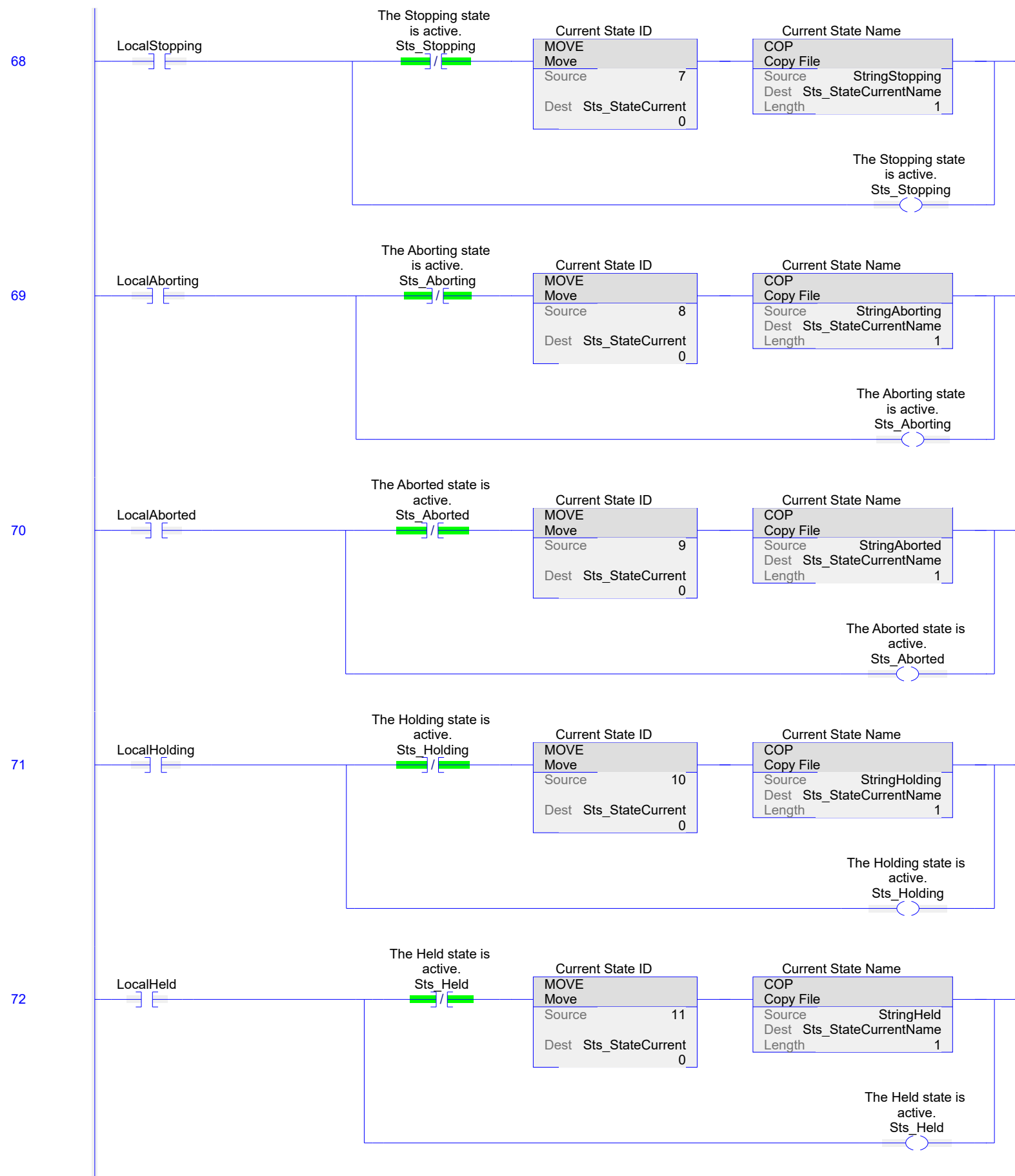


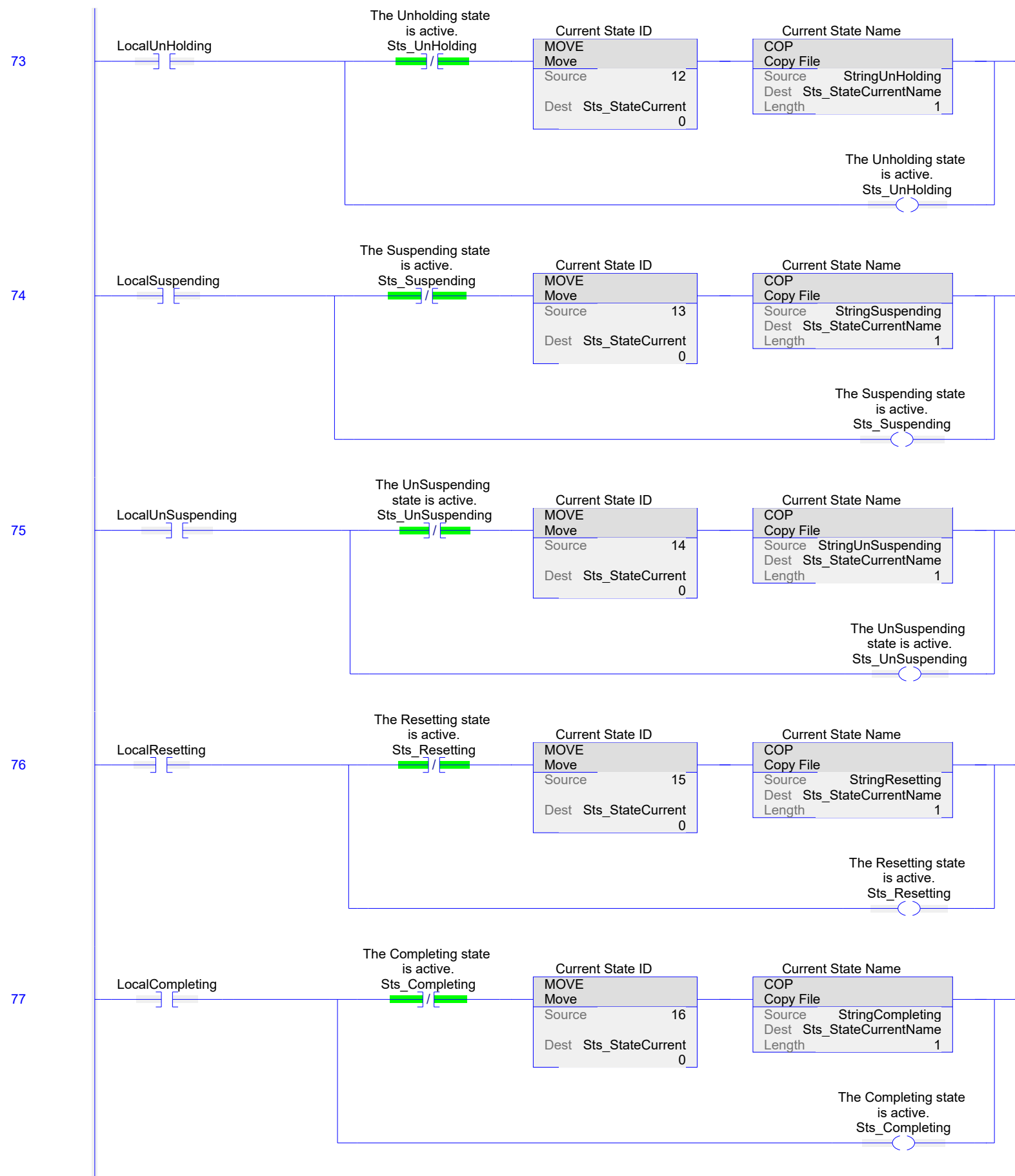


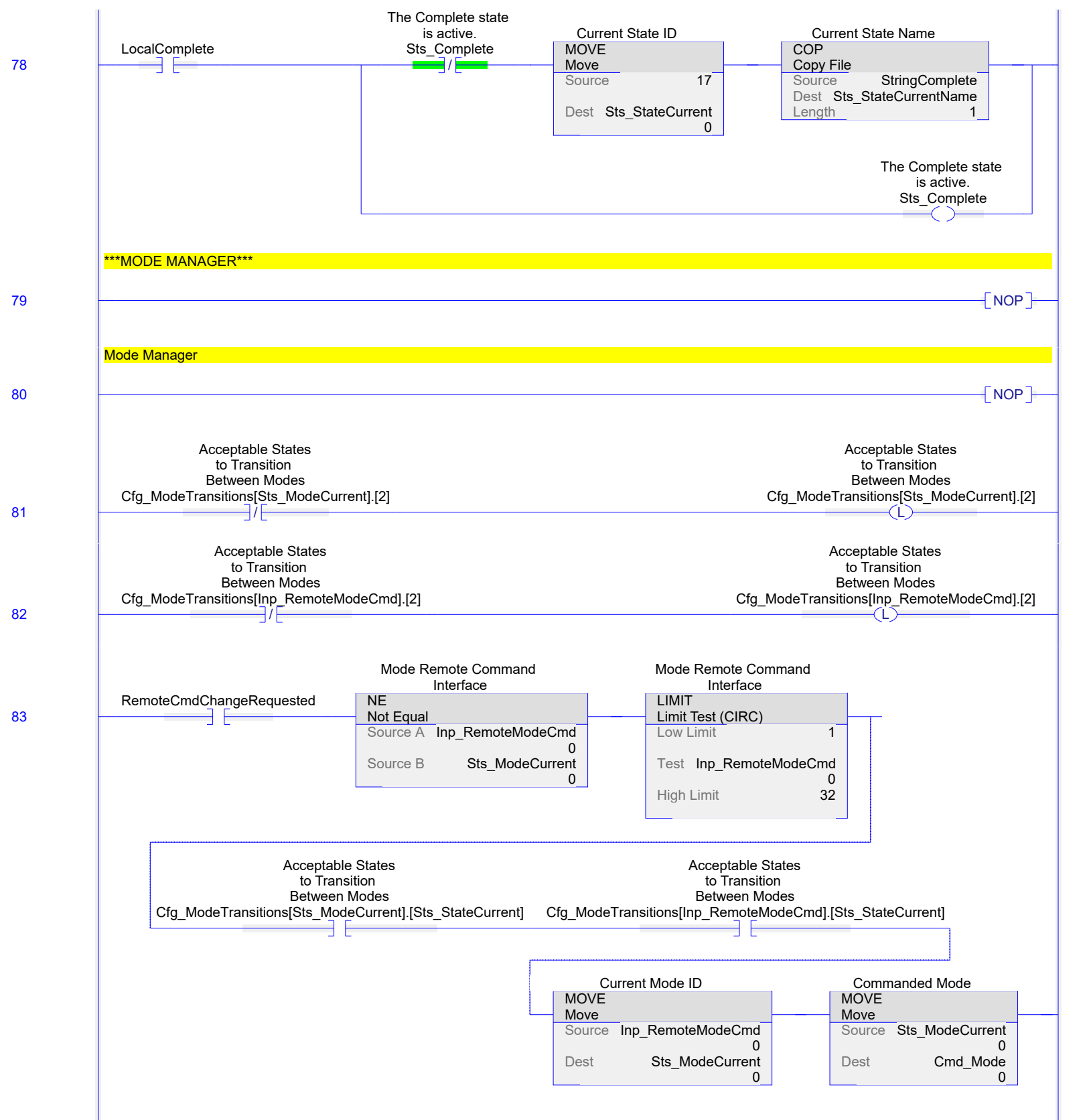


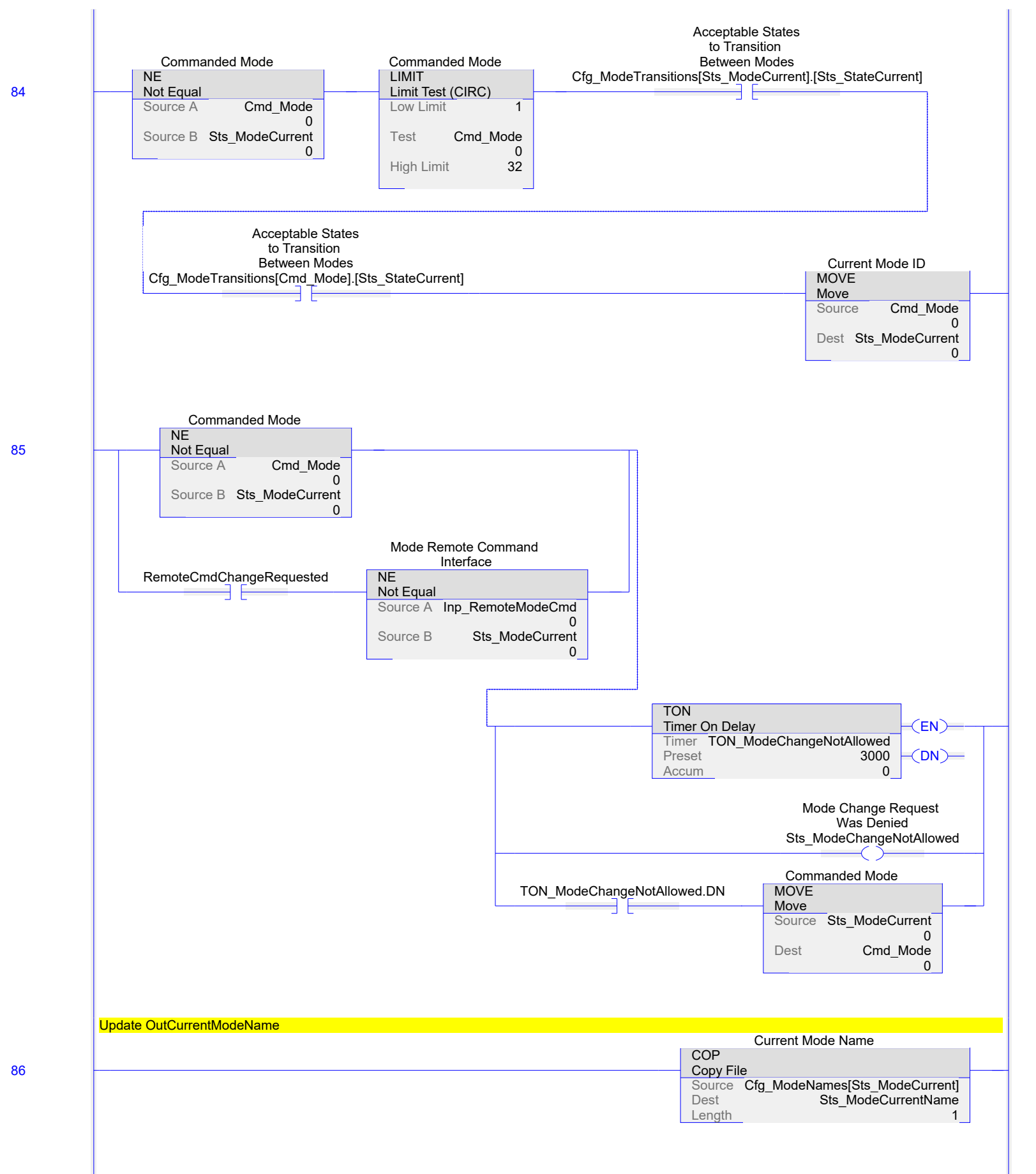




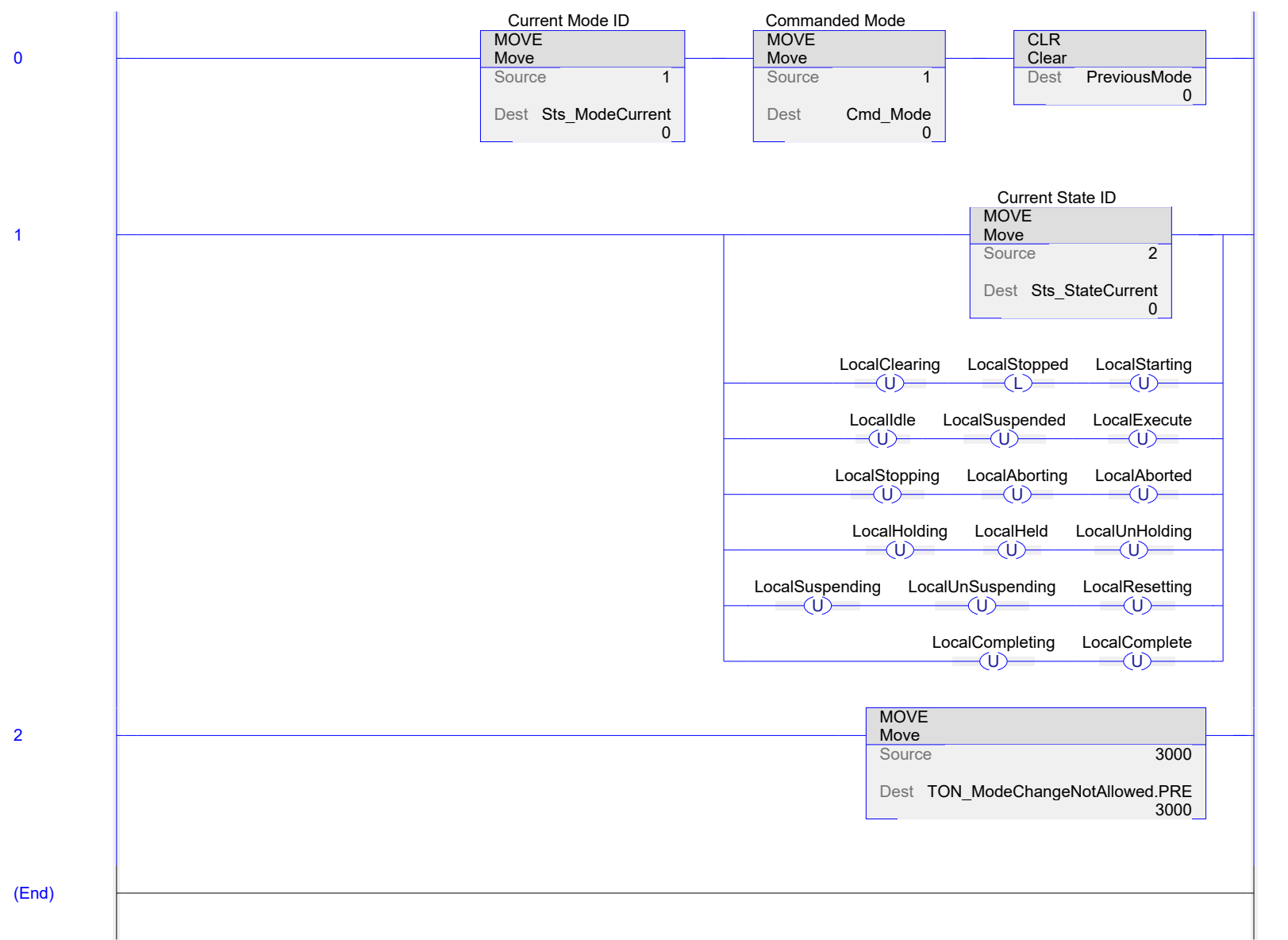








(End)



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