Controller Safety_2Axis1EM_XZ
Chapter 11 PackML integrating safety - light curtain and E-stop
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_SafetyInterface**
  - **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_XZ**
  - **MainRoutine**
  - **CM00_Procedure**
  - **CM01_EMConditions**
  - **CM02_1_ServoAxisObject_X**
    This Control Module performs the state control for the slave axis; including Enable, Disable, Reset, Absolute Home, Stop, and Abort
  - **CM02_2_ServoAxisObject_Z**
    This Control Module performs the state control for the slave axis; including Enable, Disable, Reset, Absolute Home, Stop, and Abort
  - **CM03_1_ServoAxisJog_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.
  - **CM03_2_ServoAxisJog_Z**
    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.
  - **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**

SafetyTask
- **SafetyProgram**
  - **MainRoutine**

Unscheduled

Motion Groups

Motion_Group
- **Axis_1_X**
- **Axis_2_Z**

Ungrouped Axes

Add-On Instructions

- **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_ObjectCD**
  Axis CIP Drive Object
- **PackMLv3_StateModel**

Module-Defined
- **AB:1734_15SLOT:I:0**
- **AB:1734_15SLOT:O:0**
- **AB:1734_3SLOT:I:0**
- **AB:1734_3SLOT:O:0**
- **AB:1734_DI8:C:0**
- **AB:1734_DOB8:C:0**
- **AB:1734_IB8S:O:0**
- **AB:1734_IB8S_Safety2:I:0**
- **AB:1734_IE8:C:0**
- **AB:1734_IE8:I:0**
- **AB:1734_OB8S:O:0**
- **AB:1734_OB8S_Safety1: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:5000_HART_Command_Control_Struct:I:0**
- **AB:5000_HART_Command_Control_Struct:O:0**
- **AB:5000_HART_Static_Struct:I:0**
- **AB:5000_String16_Struct:I:0**
- **AB:5000_String32_Struct: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**
- **CHANNEL_AI:I:0**
- **CHANNEL_AI:O:0**
- **CHANNEL_AI_CAL:O:0**
- **CHANNEL_AI_CJ_DIAG:I:0**
- **CHANNEL_AI_DIAG:I:0**
- **CHANNEL_AI_DIAG_CAL:I:0**
- **CHANNEL_AI_FT:I:0**
- **CHANNEL_AI_FT:O:0**
- **CHANNEL_AI_HART:I:0**
- **CHANNEL_AI_NAMUR:I:0**
- **CHANNEL_AI_NAMUR_FT:I:0**
- **CHANNEL_AO:O:0**
- **CHANNEL_AO_CAL:O:0**
- **CHANNEL_AO_DIAG:I:0**
- **CHANNEL_AO_DIAG_CAL:I:0**
- **CHANNEL_AO_FT:I:0**
- **CHANNEL_AO_FT:O:0**
- **CHANNEL_DI:I:0**
- **CHANNEL_DI_COUNTER:I:0**
- **CHANNEL_DI_COUNTER:O:0**
- **CHANNEL_DI_COUNTER_FT:O:0**

- **CHANNEL_DI_FT:I:0**
- **CHANNEL_DI_FT:O:0**
- **CHANNEL_DI_TIMESTAMP:I:0**
- **CHANNEL_DI_TIMESTAMP:O:0**
- **CHANNEL_DI_TIMESTAMP_FT:I:0**
- **CHANNEL_DI_TIMESTAMP_FT:O:0**
- **CHANNEL_DO:I:0**
- **CHANNEL_DO:O:0**
- **CHANNEL_DO_DIAG:I:0**
- **CHANNEL_DO_FT:I:0**
- **CHANNEL_DO_FT:O:0**
- **CHANNEL_DO_OVERRIDE:O:0**
- **CHANNEL_DO_SCHEDULED:O:0**
- **CHANNEL_HSC:I:0**
- **CHANNEL_HSC:O:0**
- **PAX_HART_DEVICE:I:0**

Trends

I/O Configuration

- **5069 Backplane**
  - **[0] 5069-L310ERMS3 Safety_2Axis1EM_XZ**
- **A1/A2, Ethernet**
  - **5069-L310ERMS3 Safety_2Axis1EM_XZ**
  - **1734-AENTR/B aentr**
    - **PointIO 3 Slot Chassis**
      - **[0] 1734-AENTR/B aentr**
      - **[1] 1734-IB8S/B Din**
      - **[2] 1734-OB8S/B Dout**
  - **2097-V31PR0-LM Axis_X_Servo**
  - **2097-V31PR0-LM Axis_Z_Servo**

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

Version Comments:

//

0 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

1 Inp_Hardwired_Clear — Wrk_ClearRequest
Clear pushbutton
HMI_I_Clear
<CLEAR_PB>

RESET CONDITIONS

The Unit Condition Set Here Is Used to Initate 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

2 Inp_Hardwired_Reset — Wrk_ResetRequest
HMI_I_Reset
<HMI_Ins[0].2>

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

3 Inp_Hardwired_Start — Wrk_StartRequest
HMI_I_Start
<HMI_Ins[0].0>

***** Changed polarity of Inp_Hardwired_Stop to match it being a N.C. contact

STOP CONDITIONS

The Unit Condition Set Here is Used to Initaite 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

4

Inp_Hardwired_Stop — Wrk_StopRequest

HMI_I_Stop
<HMI_Ins[0].1>

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 Initaite 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

5

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

6

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

7

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

8

Inp_UpstreamMaterialInterlock

Inp_DownstreamMaterialInterlock

Wrk_SuspendRequest

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.

9

GE
Grtr Than or Eql (A>=B)
Source A Sts_GoodProducts
0
Source B Inp_BatchCountSetpoint
0

Wrk_CompleteRequest

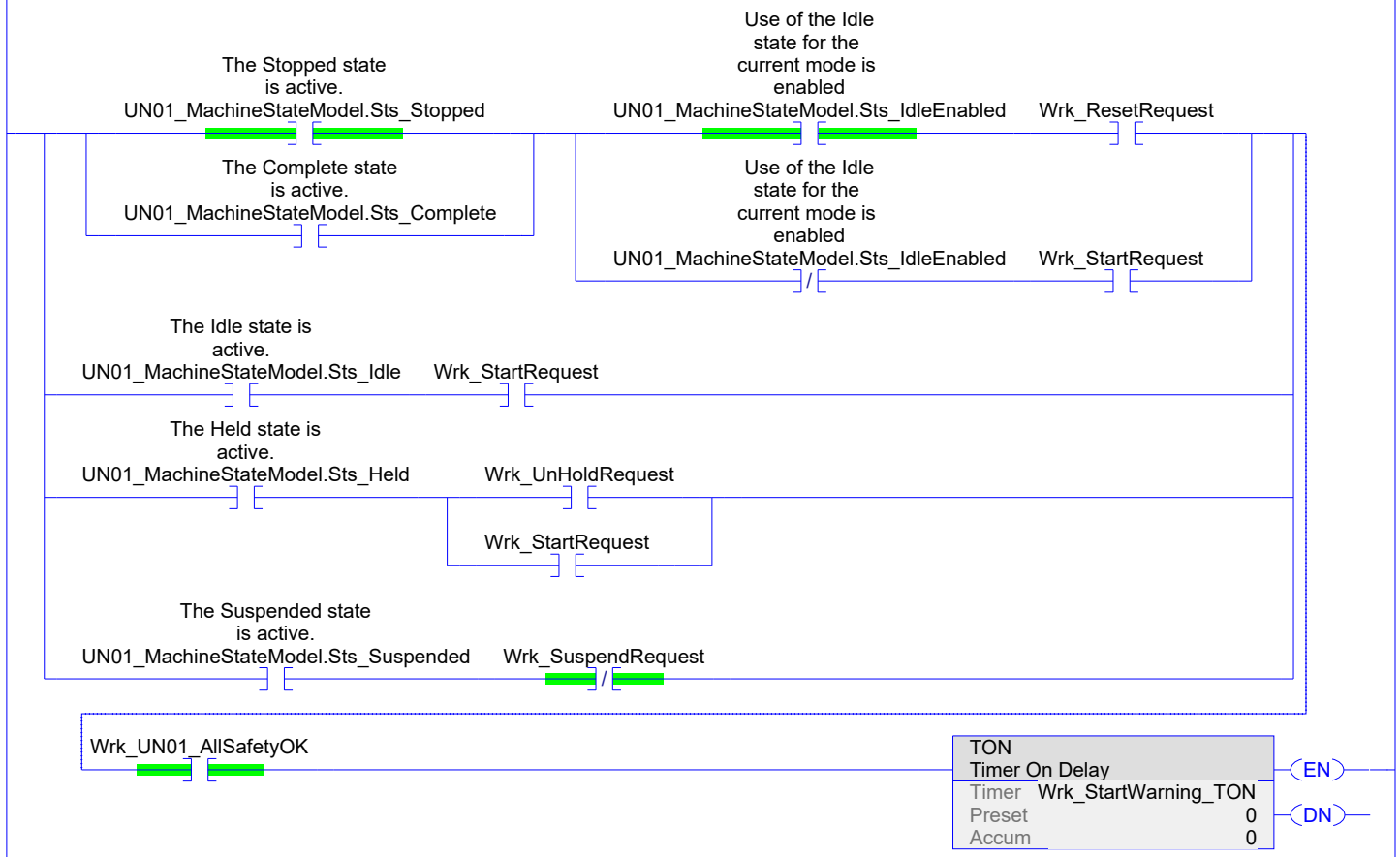
***** Wrk_StartWarning_TON preset changed to zero

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:

//

0 NOP

COMMUNICATION FAULTS

1 Inp_NetworksOK —] [— Wrk_UN01_NetworkCommunicationOK —( )—

ESTOP COLLECTION

2 Inp_ESTOPButton1 —] [— Inp_ESTOPButton2 —] [— Inp_ESTOPButton3 —] [— Wrk_UN01_EstopOK —( )—

GUARD DOOR COLLECTION

3 Inp_GuardDoor1 —] [— Inp_GuardDoor2 —] [— Inp_GuardDoor3 —] [— Wrk_UN01_GuardsOK —( )—

LIGHT CURTAIN COLLECTION

4 Inp_LightCurtain1 —] [— Inp_LightCurtain2 —] [— Inp_LightCurtain3 —] [— Wrk_UN01_LightCurtainsOK —( )—

ALL SAFETY INPUTS OK

5 Wrk_UN01_EstopOK —] [— Wrk_UN01_GuardsOK —] [— Wrk_UN01_LightCurtainsOK —] [— Wrk_UN01_AllSafetyOK —( )—

MACHINE MAJOR FAULTS

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

----

6 Wrk_UN01_NetworkCommunicationOK —]/[— MOVE Move Source 1 Dest HMI_O_MajorFaultMessage 0

7 Inp_MachineJam_Infeed —] [— MOVE Move Source 2 Dest HMI_O_MajorFaultMessage 0

8 Inp_MachineJam_Outfeed —] [— MOVE Move Source 3 Dest HMI_O_MajorFaultMessage 0

GENERAL UNIT MAJOR FAULT - WILL RESULT IN MACHINE ABORT REQUEST. ADD MACHINE SPECIFIC MAJOR FAULT CONDITIONS AS RUNG IN CONDITIONS

9

NE
Not Equal
Source A HMI_O_MajorFaultMessage
0
Source B 0

UN01_MachineFault_Major

MACHINE MINOR FAULTS

ADD MAJOR MACHINE FAULTS THAT SHOULD RESULT IN A HOLD (IF STATE IS ENABLED) OR STOP (IF HOLD STATE IS DISABLED) REQUEST TO THE MACHINE

10

Inp_LowLubrication

MOVE
Move
Source 1
Dest HMI_O_MinorFaultMessage
0

Inp_LowLubrication

EQ
Equal
Source A HMI_O_MinorFaultMessage
0
Source B 1

MOVE
Move
Source 0
Dest HMI_O_MinorFaultMessage
0

11

Inp_LowMagazine

MOVE
Move
Source 2
Dest HMI_O_MinorFaultMessage
0

Inp_LowMagazine

EQ
Equal
Source A HMI_O_MinorFaultMessage
0
Source B 2

MOVE
Move
Source 0
Dest HMI_O_MinorFaultMessage
0

GENERAL UNIT MINOR FAULT - WILL RESULT IN MACHINE HOLD REQUEST IF HOLDING STATE IS ENABLED OR STOP IF HOLDING STATE IS NOT ENABLED.

12

NE
Not Equal
Source A HMI_O_MinorFaultMessage
0
Source B 0

UN01_MachineFault_Minor

13

```
--------------------------------------------------

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
SATISIFED THE FAULTS WILL CLEAR AUTOMATICALLY.  MINOR FAULT INDICATORS WILL ALSO BE CLEARED IN THE CLEARING STATE.


--------------------------------------------------
```

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

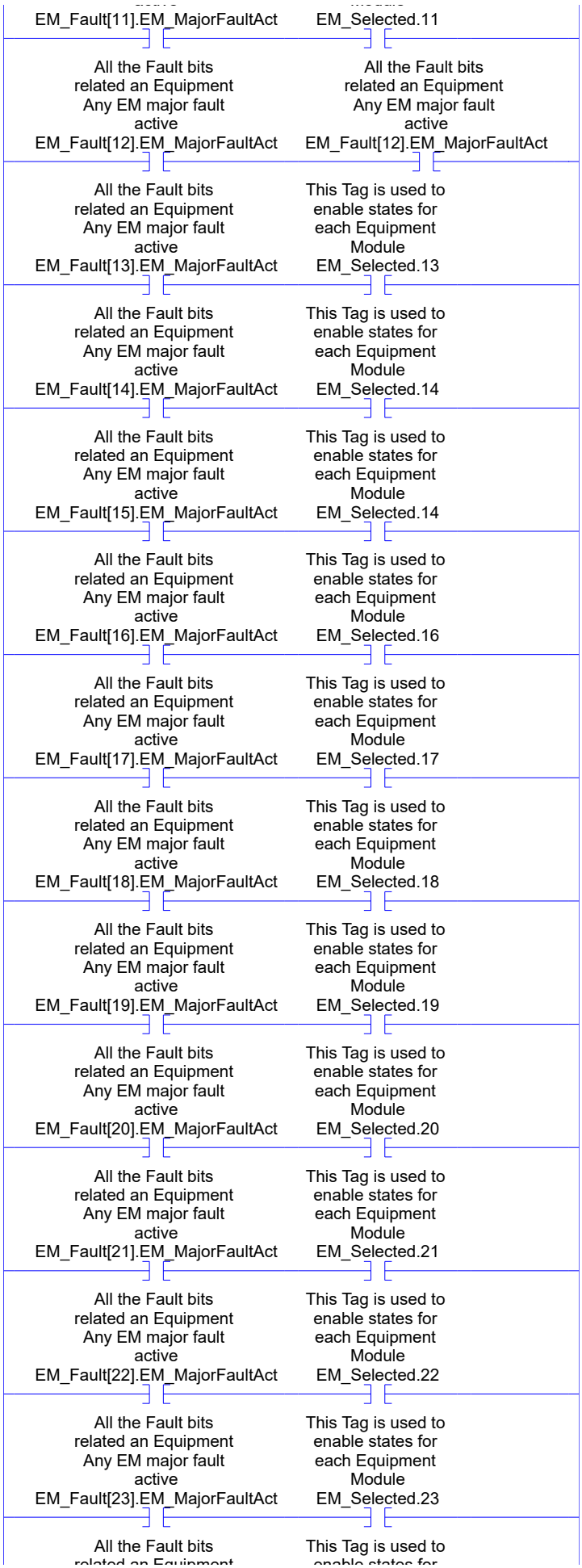
14

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


EM_Fault[11].EM_MajorFaultAct
EM_Selected.11
All the Fault bits related an Equipment Any EM major fault active
EM_Fault[12].EM_MajorFaultAct
EM_Fault[12].EM_MajorFaultAct
All the Fault bits related an Equipment Any EM major fault active
EM_Fault[13].EM_MajorFaultAct
This Tag is used to enable states for each Equipment Module
EM_Selected.13
EM_Fault[14].EM_MajorFaultAct
EM_Selected.14
EM_Fault[15].EM_MajorFaultAct
EM_Selected.14
EM_Fault[16].EM_MajorFaultAct
EM_Selected.16
EM_Fault[17].EM_MajorFaultAct
EM_Selected.17
EM_Fault[18].EM_MajorFaultAct
EM_Selected.18
EM_Fault[19].EM_MajorFaultAct
EM_Selected.19
EM_Fault[20].EM_MajorFaultAct
EM_Selected.20
EM_Fault[21].EM_MajorFaultAct
EM_Selected.21
EM_Fault[22].EM_MajorFaultAct
EM_Selected.22
EM_Fault[23].EM_MajorFaultAct
EM_Selected.23

related an Equipment | enable states for
Any EM major fault active EM_Fault[24].EM_MajorFaultAct | 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

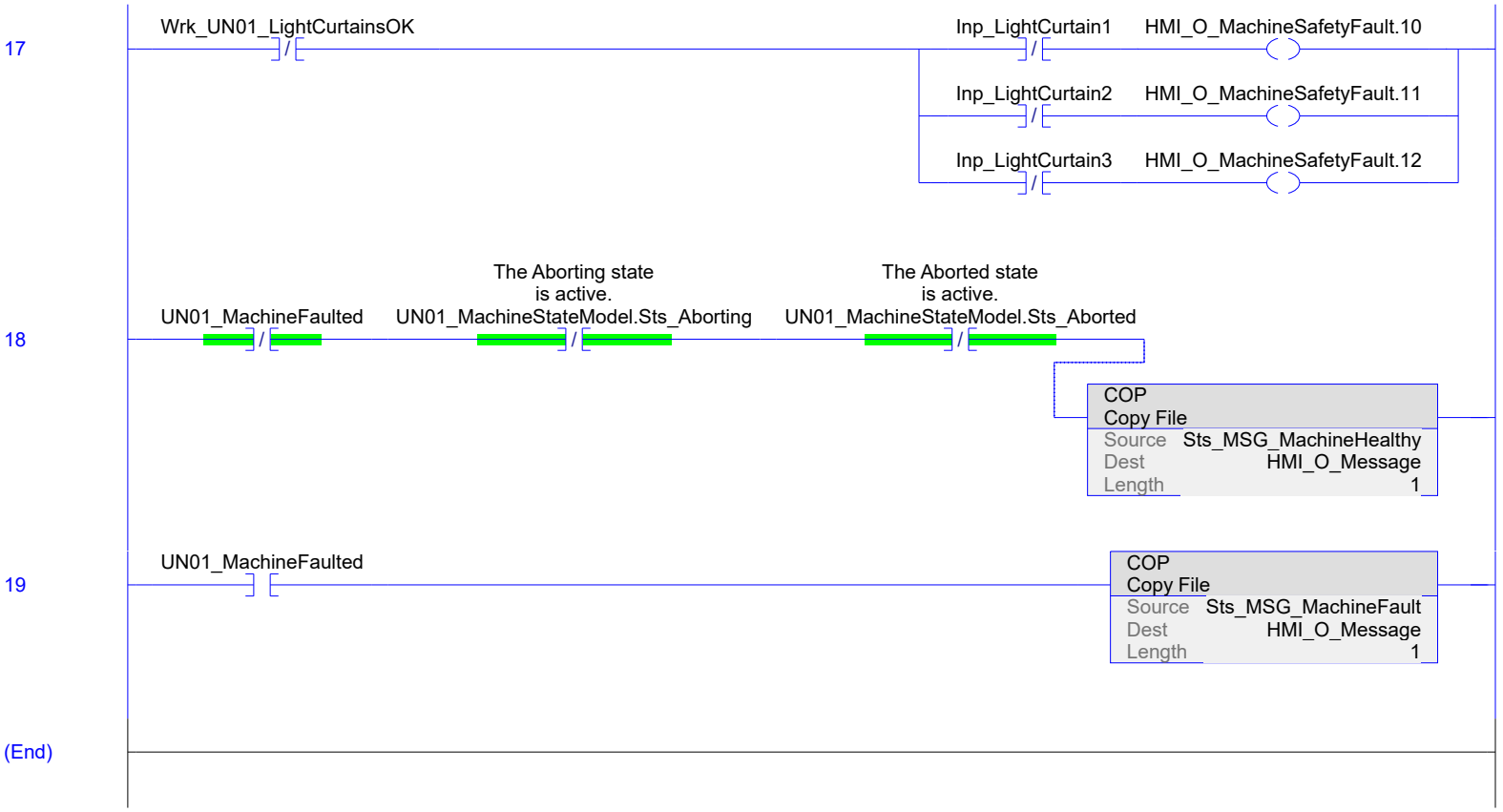
All the Fault bits related an Equipment Any EM major fault active EM_Fault[31].EM_MajorFaultAct | This Tag is used to enable states for each Equipment Module EM_Selected.31

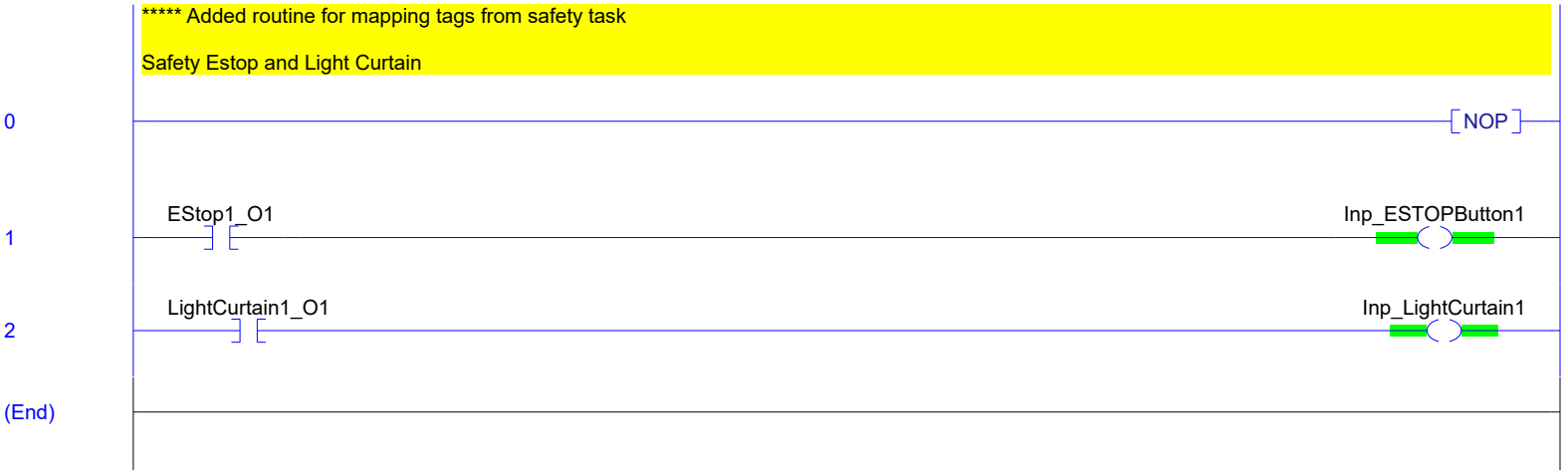
15

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.

0 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

1 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

2 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.

3 JSR Jump To Subroutine, Routine Name CM03_FaultHandler

***** Added routine

4 JSR Jump To Subroutine, Routine Name CM04_SafetyInterface

5 JSR Jump To Subroutine, Routine Name UP02_StateComplete

6

JSR
Jump To Subroutine
Routine Name UP01_PackML

***** Added Routine

7

JSR
Jump To Subroutine
Routine Name UP00_Procedure

***** Following rungs added for C-More Panel

Indicator lamps for PackML state

8

NOP

9

Lamp_Flash_Tmr.DN

TON
Timer On Delay
Timer Lamp_Flash_Tmr
Preset 1000
Accum 810
EN
DN

10

CMP
Compare
Expression Lamp_Flash_Tmr.ACC>500

Lamp_Flash

11

The Idle state is active.
UN01_MachineStateModel.Sts_Idle

LA_IDLE
<HMI_Outs[0].0>

The Resetting state is active.
UN01_MachineStateModel.Sts_Resetting Lamp_Flash

12

The Execute state is active.
UN01_MachineStateModel.Sts_Execute

LA_EXECUTE
<HMI_Outs[0].1>

The Starting state is active.
UN01_MachineStateModel.Sts_Starting Lamp_Flash

13

The Aborted state is active.
UN01_MachineStateModel.Sts_Aborted

LA_ABORTED
<HMI_Outs[0].2>

The Aborting state is active.
UN01_MachineStateModel.Sts_Aborting Lamp_Flash

14

The Stopped state is active.
UN01_MachineStateModel.Sts_Stopped

LA_STOPPED

The Stopping state is active.
UN01_MachineStateModel.Sts_Stopping Lamp_Flash

15

The Clearing state is active.
UN01_MachineStateModel.Sts_Clearing Lamp_Flash

LA_CLEARING

16

COP Copy File	
Source	HMI_O_StateCurrentName
Dest	HMI_O_GlobalStateCurrentName
Length	1

COP Copy File	
Source	HMI_O_ModeCurrentName
Dest	HMI_O_GlobalModeCurrentName
Length	1

(End)

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

Version Comments:

//

0 NOP

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

1 This Tag is used to enable states for each Equipment Module
MOVE Move Source 0 Dest EM_Selected 2#0000_0000_0000_0000_0000_0000_0000_0010
MOVE Move Source -1 Dest Wrk_Compare_All_EM_Enabled -1

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

2 MOVE Move Source 5 Dest HMI_O_MachineSpeed_RMP 5
MOVE Move Source 0 Dest HMI_O_MachineSpeed_LIMlo 0
MOVE Move Source 100 Dest HMI_O_MachineSpeed_LIMhi 100

Clear unit procedure step

3 MOVE Move Source 0 Dest UP_Exec_Step 0

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

4 Inp_NetworksOK ( ) Inp_ESTOPButton2 ( ) Inp_ESTOPButton3 ( ) Inp_GuardDoor1 ( ) Inp_GuardDoor2 ( ) Inp_GuardDoor3 ( ) Inp_LightCurtain2 ( )
Inp_LightCurtain3 ( )

***** Disable unused stop

5 Inp_Hardwired_Stop ( )

***** Disable interlocks

6 Inp_UpstreamMaterialInterlock ( ) Inp_DownstreamMaterialInterlock ( )

***** Enable remote commands

7 Enable Remote Commands
UN01_MachineStateModel.Cfg_RemoteCmdEnable ( )

(End)

***** Entire routine added

EXECUTE State motion steps/commands for overall operation

++++++++++++++++++++++++++++++++

0

NOP

Resetting - clear step number

1

The Resetting state is active.
UN01_MachineStateModel.Sts_Resetting

MOVE
Move
Source 0
Dest UP_Exec_Step
0

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

2

EQ
Equal
Source A UP_Exec_Step
0
Source B 0

Wrk_UP_Exec_NoStepsActive

EXECUTE -

If no steps active, start in step 1

3

The Execute state is active.
UN01_MachineStateModel.Sts_Execute

AFI

Wrk_UP_Exec_NoStepsActive

MOVE
Move
Source 1
Dest UP_Exec_Step
0

4

EQ
Equal
Source A UP_Exec_Step
0
Source B 20

Wrk_UP_Exec_LastStep

Step 20 - When out of Execute, move zero into step number so will start over at next push of start

5

Wrk_UP_Exec_LastStep

The Execute state is active.
UN01_MachineStateModel.Sts_Execute

MOVE
Move
Source 0
Dest UP_Exec_Step
0

(End)

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

Version Comments:

//

0 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

1
The Aborted state is active. UN01_MachineStateModel.Sts_Aborted
Wrk_ClearRequest
Request that current state transition to Clearing UN01_MachineStateModel.Cmd_Clear

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

2
The Stopped state is active. UN01_MachineStateModel.Sts_Stopped
The Complete state is active. UN01_MachineStateModel.Sts_Complete
Wrk_StartWarningExpired
Request that current state transition to Resetting UN01_MachineStateModel.Cmd_Reset

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

3
The Idle state is active. UN01_MachineStateModel.Sts_Idle
Wrk_StartWarningExpired
Request that current state transition to Starting UN01_MachineStateModel.Cmd_Start

STATE COMMAND
HOLD

4
The Execute state is active. UN01_MachineStateModel.Sts_Execute
Wrk_HoldRequest
Request that current state transition to Holding UN01_MachineStateModel.Cmd_Hold

STATE COMMAND
UNHOLD

5

The Held state is active.		Request that current state transition to Execute
UN01_MachineStateModel.Sts_Held	Wrk_StartWarningExpired	UN01_MachineStateModel.Cmd_UnHold

STATE COMMAND
SUSPEND

6

The Execute state is active.		Request that current state transition to Suspending
UN01_MachineStateModel.Sts_Execute	Wrk_SuspendRequest	UN01_MachineStateModel.Cmd_Suspend

STATE COMMAND
UN-SUSPEND

7

The Suspended state is active.		Request that current state transition to Execute
UN01_MachineStateModel.Sts_Suspended	Wrk_StartWarningExpired	UN01_MachineStateModel.Cmd_UnSuspend

STATE COMMAND
STOP

This Command is Triggered by the Unit Condition Indicating Any Stop 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, Or Complete), When Each Is Enabled, To:
1) The Stopping State, If Stopping is Enabled
2) The Stopped State, If Stopping is Disabled

8

The Aborting state is active.	The Aborted state is active.	The Stopping state is active.
UN01_MachineStateModel.Sts_Aborting	UN01_MachineStateModel.Sts_Aborted	UN01_MachineStateModel.Sts_Stopping

The Stopped state is active.	The Clearing state is active.		Request that current state transition to Stopping
UN01_MachineStateModel.Sts_Stopped	UN01_MachineStateModel.Sts_Clearing	Wrk_StopRequest	UN01_MachineStateModel.Cmd_Stop

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

9

The Aborting state is active.
UN01_MachineStateModel.Sts_Aborting

The Aborted state is active.
UN01_MachineStateModel.Sts_Aborted

The Clearing state is active.
UN01_MachineStateModel.Sts_Clearing

Wrk_AbortRequest

Request that current state transition to Aborting
UN01_MachineStateModel.Cmd_Abort

***** Mode change requests from HMI

10

HMI_I_ModeChangeReq

State Remote Command Change Request
UN01_MachineStateModel.Inp_RemoteStateCmdChangeRequest

Mode Remote Command Interface

MOVE
Move

Source HMI_I_ModeCmd
<HMI_Outs[1]>
1

Dest UN01_MachineStateModel.Inp_RemoteModeCmd
1

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
UN01_MachineStateModel.Cmd_StateComplete

11

PackMLv3_StateModel

PackMLv3_StateModel	UN01_MachineStateModel
Cfg_ModeTransitions	Cfg_ModeTransitions
Cfg_DisableStates	Cfg_DisableStates
Cfg_ModeNames	Cfg_ModeNames
Cmd_Mode	1
Cmd_Reset	0
Cmd_Start	0
Cmd_Stop	0
Cmd_Hold	0
Cmd_UnHold	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

U

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

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:

//

0 NOP

1
Use of the Aborting state for the current mode is enabled
UN01_MachineStateModel.Sts_AbortingEnabled

The Aborting state is active.
UN01_MachineStateModel.Sts_Aborting

MEQ
Mask Equal
Source EM_Aborting_Done
2#0000_0000_0000_0000_0000_0000_0000_0000
Mask EM_Selected
2#0000_0000_0000_0000_0000_0000_0000_0010
Compare Wrk_Compare_All_EM_Enabled
-1

PackML State Complete Command - Latch Cmd_StateComplete to allow transition from acting state to wait state
UN01_MachineStateModel.Cmd_StateComplete
L

2
Use of the Clearing state for the current mode is enabled
UN01_MachineStateModel.Sts_ClearingEnabled

The Clearing state is active.
UN01_MachineStateModel.Sts_Clearing

MEQ
Mask Equal
Source EM_Clearing_Done
2#0000_0000_0000_0000_0000_0000_0000_0000
Mask EM_Selected
2#0000_0000_0000_0000_0000_0000_0000_0010
Compare Wrk_Compare_All_EM_Enabled
-1

PackML State Complete Command - Latch Cmd_StateComplete to allow transition from acting state to wait state
UN01_MachineStateModel.Cmd_StateComplete
L

3

Use of the Stopping state for the current mode is enabled
UN01_MachineStateModel.Sts_StoppingEnabled

The Stopping state is active.
UN01_MachineStateModel.Sts_Stopping

MEQ
Mask Equal
Source EM_Stopping_Done
2#0000_0000_0000_0000_0000_0000_0000_0000
Mask EM_Selected
2#0000_0000_0000_0000_0000_0000_0000_0010
Compare Wrk_Compare_All_EM_Enabled
-1

PackML State Complete Command - Latch Cmd_StateComplete to allow transition from acting state to wait state
UN01_MachineStateModel.Cmd_StateComplete
(L)

***** Also make sure unit procedure initialized

4

Use of the Resetting state for the current mode is enabled
UN01_MachineStateModel.Sts_ResettingEnabled

The Resetting state is active.
UN01_MachineStateModel.Sts_Resetting

Wrk_UP_Exec_NoStepsActive

MEQ
Mask Equal
Source EM_Resetting_Done
2#0000_0000_0000_0000_0000_0000_0000_0000
Mask EM_Selected
2#0000_0000_0000_0000_0000_0000_0000_0010
Compare Wrk_Compare_All_EM_Enabled
-1

PackML State Complete Command - Latch Cmd_StateComplete to allow transition from acting state to wait state
UN01_MachineStateModel.Cmd_StateComplete
(L)

5

Use of the Starting state for the current mode is enabled
UN01_MachineStateModel.Sts_StartingEnabled

The Starting state is active.
UN01_MachineStateModel.Sts_Starting

MEQ
Mask Equal
Source EM_Starting_Done
2#0000_0000_0000_0000_0000_0000_0000_0000
Mask EM_Selected
2#0000_0000_0000_0000_0000_0000_0000_0010
Compare Wrk_Compare_All_EM_Enabled
-1

PackML State Complete Command - Latch Cmd_StateComplete to allow transition from acting state to wait state
UN01_MachineStateModel.Cmd_StateComplete
(L)

6

Use of the Holding state for the current mode is enabled
UN01_MachineStateModel.Sts_HoldingEnabled

The Holding state is active.
UN01_MachineStateModel.Sts_Holding

MEQ
Mask Equal
Source EM_Holding_Done
2#0000_0000_0000_0000_0000_0000_0000_0000
Mask EM_Selected
2#0000_0000_0000_0000_0000_0000_0000_0010
Compare Wrk_Compare_All_EM_Enabled
-1

PackML State Complete Command - Latch Cmd_StateComplete to allow transition from acting state to wait state
UN01_MachineStateModel.Cmd_StateComplete
L

7

Use of the UnHolding state for the current mode is enabled
UN01_MachineStateModel.Sts_UnHoldingEnabled

The Unholding state is active.
UN01_MachineStateModel.Sts_UnHolding

MEQ
Mask Equal
Source EM_UnHolding_Done
2#0000_0000_0000_0000_0000_0000_0000_0000
Mask EM_Selected
2#0000_0000_0000_0000_0000_0000_0000_0010
Compare Wrk_Compare_All_EM_Enabled
-1

PackML State Complete Command - Latch Cmd_StateComplete to allow transition from acting state to wait state
UN01_MachineStateModel.Cmd_StateComplete
L

8

Use of the Suspending state for the current mode is enabled
UN01_MachineStateModel.Sts_SuspendingEnabled

The Suspending state is active.
UN01_MachineStateModel.Sts_Suspending

MEQ
Mask Equal
Source EM_Suspending_Done
2#0000_0000_0000_0000_0000_0000_0000_0000
Mask EM_Selected
2#0000_0000_0000_0000_0000_0000_0000_0010
Compare Wrk_Compare_All_EM_Enabled
-1

PackML State Complete Command - Latch Cmd_StateComplete to allow transition from acting state to wait state
UN01_MachineStateModel.Cmd_StateComplete
L

9

Use of the UnSuspending state for the current mode is enabled
UN01_MachineStateModel.Sts_UnSuspendingEnabled

The UnSuspending state is active.
UN01_MachineStateModel.Sts_UnSuspending

MEQ
Mask Equal
Source EM_UnSuspending_Done
2#0000_0000_0000_0000_0000_0000_0000_0000
Mask EM_Selected
2#0000_0000_0000_0000_0000_0000_0000_0010
Compare Wrk_Compare_All_EM_Enabled
-1

PackML State Complete Command - Latch Cmd_StateComplete to allow transition from acting state to wait state
UN01_MachineStateModel.Cmd_StateComplete
(L)

***** Added state complete for COMPLETING state

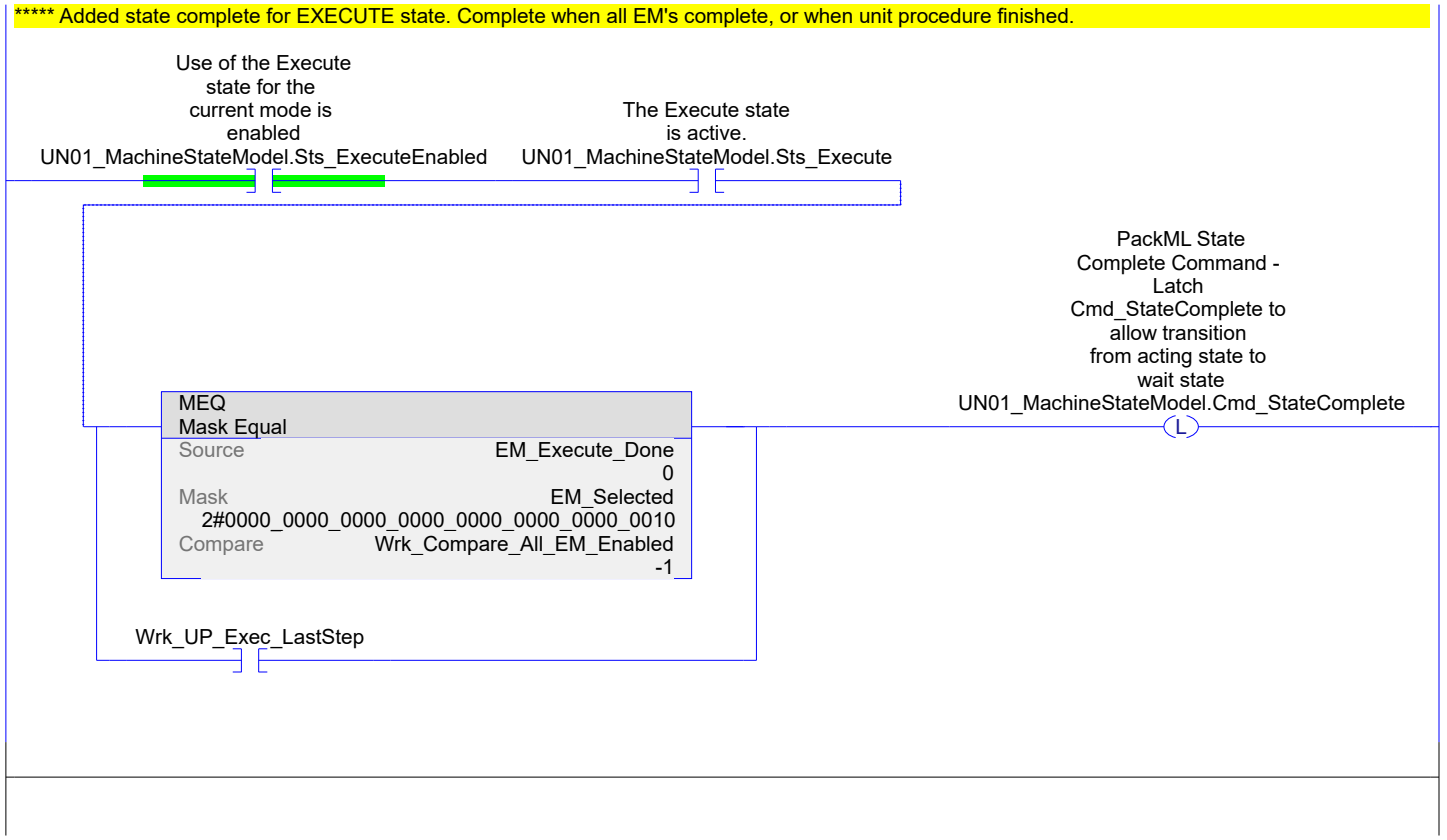
10

Use of the Completing state for the current mode is enabled
UN01_MachineStateModel.Sts_CompletingEnabled

The Completing state is active.
UN01_MachineStateModel.Sts_Completing

MEQ
Mask Equal
Source EM_Completing_Done
0
Mask EM_Selected
2#0000_0000_0000_0000_0000_0000_0000_0010
Compare Wrk_Compare_All_EM_Enabled
-1

PackML State Complete Command - Latch Cmd_StateComplete to allow transition from acting state to wait state
UN01_MachineStateModel.Cmd_StateComplete
(L)



***** 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

1

The Resetting state is active.
Inp_MachineStateModel.Sts_Resetting
<UN01_MachineStateModel.Sts_Resetting>

The Idle state is active.
Inp_MachineStateModel.Sts_Idle
<UN01_MachineStateModel.Sts_Idle>

EM sequence step number

MOVE
Move
Source 0
Dest Wrk_EM_ProcedureStep
0

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

2

EM sequence step number

EQ
Equal
Source A Wrk_EM_ProcedureStep
0
Source B 0

EM Sequence no steps active
Wrk_EM_ProcedureNoStepsActive

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

3

The Execute state is active.
Inp_MachineStateModel.Sts_Execute
<UN01_MachineStateModel.Sts_Execute>

Current Mode ID

EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Produce
1

EM Sequence no steps active
Wrk_EM_ProcedureNoStepsActive

EM sequence step number

MOVE
Move
Source 1
Dest Wrk_EM_ProcedureStep
0

Em Procedure Step 1 - Wait for Cycle_Start signal

4

The Execute state is active.
Inp_MachineStateModel.Sts_Execute
<UN01_MachineStateModel.Sts_Execute>

EM sequence step number

EQ
Equal
Source A Wrk_EM_ProcedureStep
0
Source B 1

Cycle_Start

EM sequence step number

MOVE
Move
Source 2
Dest Wrk_EM_ProcedureStep
0

EM Procedure Step 2 - X +move

5

The Execute state is active.
Inp_MachineStateModel.Sts_Execute
<UN01_MachineStateModel.Sts_Execute>

EM sequence step number

EQ
Equal
Source A Wrk_EM_ProcedureStep 0
Source B 2

First X move

MAM
Motion Axis Move
Axis Ref_ServoAxis_1 <Axis_1_X>
Motion Control Wrk_MI_Move1_1_X
Move Type 1
Position HMI_I_XMovePosition 100.0
Speed HMI_I_XMoveSpeed 50.0
Speed Units Units per sec
Accel Rate HMI_I_XMoveAccelDecel 50.0
Accel Units % of Maximum
Decel Rate HMI_I_XMoveAccelDecel 50.0
Decel Units % of Maximum
Profile S-Curve
Accel Jerk 10
Decel Jerk 10
Jerk Units % of Time
Merge Disabled
Merge Speed Current
Lock Position 0
Lock Direction 0
Event Distance 0
Calculated Data 0

EN
DN
ER
IP
PC

First X move
Wrk_MI_Move1_1_X.PC

EM sequence step number

MOVE
Move
Source 3
Dest Wrk_EM_ProcedureStep 0

EM Procedure Step 3 - Z +move

6

The Execute state is active.
Inp_MachineStateModel.Sts_Execute
<UN01_MachineStateModel.Sts_Execute>

EM sequence step number

EQ
Equal
Source A Wrk_EM_ProcedureStep 0
Source B 3

First Z Move

MAM
Motion Axis Move
Axis Ref_ServoAxis_2 <Axis_2_Z>
Motion Control Wrk_MI_Move1_2_Z
Move Type 1
Position HMI_I_ZMovePosition 35.0
Speed HMI_I_ZMoveSpeed 50.0
Speed Units Units per sec
Accel Rate HMI_I_XMoveAccelDecel 50.0
Accel Units % of Maximum
Decel Rate HMI_I_XMoveAccelDecel 50.0
Decel Units % of Maximum
Profile S-Curve
Accel Jerk 10
Decel Jerk 10
Jerk Units % of Time
Merge Disabled
Merge Speed Current
Lock Position 0
Lock Direction 0
Event Distance 0
Calculated Data 0

EN
DN
ER
IP
PC

First Z Move
Wrk_MI_Move1_2_Z.PC

EM sequence step number

MOVE
Move
Source 4
Dest Wrk_EM_ProcedureStep 0

EM Procedure Step 4 - Wait for Cycle_Finish

7

The Execute state is active.
Inp_MachineStateModel.Sts_Execute
<UN01_MachineStateModel.Sts_Execute>

EM sequence step number

EQ
Equal
Source A Wrk_EM_ProcedureStep 0
Source B 4

Cycle_Finish

EM sequence step number

MOVE
Move
Source 8
Dest Wrk_EM_ProcedureStep 0

EM Procedure Step 8 - Move Z back to starting point (home)

8

The Execute state is active.
Inp_MachineStateModel.Sts_Execute
<UN01_MachineStateModel.Sts_Execute>

EM sequence step number

EQ
Equal
Source A Wrk_EM_ProcedureStep 0
Source B 8

Second Z move

MAM
Motion Axis Move
Axis Ref_ServoAxis_2 <Axis_2_Z>
Motion Control Wrk_MI_Move2_2_Z
Move Type 0
Position 0.0
Speed HMI_I_ZMoveSpeed 50.0
Speed Units Units per sec
Accel Rate HMI_I_XMoveAccelDecel 50.0
Accel Units % of Maximum
Decel Rate HMI_I_XMoveAccelDecel 50.0
Decel Units % of Maximum
Profile S-Curve
Accel Jerk 10
Decel Jerk 10
Jerk Units % of Time
Merge Disabled
Merge Speed Current
Lock Position 0
Lock Direction 0
Event Distance 0
Calculated Data 0

EN
DN
ER
IP
PC

Second Z move
Wrk_MI_Move2_2_Z.PC

EM sequence step number

MOVE
Move
Source 10
Dest Wrk_EM_ProcedureStep 0

EM Procedure Step 10 - X back to starting point (home).

9

The Execute state is active.
Inp_MachineStateModel.Sts_Execute
<UN01_MachineStateModel.Sts_Execute>

EM sequence step number

EQ
Equal
Source A Wrk_EM_ProcedureStep 0
Source B 10

Second X move

MAM
Motion Axis Move
Axis Ref_ServoAxis_1 <Axis_1_X>
Motion Control Wrk_MI_Move2_1_X
Move Type 0
Position 0.0
Speed HMI_I_XMoveSpeed 50.0
Speed Units Units per sec
Accel Rate HMI_I_XMoveAccelDecel 50.0
Accel Units % of Maximum
Decel Rate HMI_I_XMoveAccelDecel 50.0
Decel Units % of Maximum
Profile S-Curve
Accel Jerk 10
Decel Jerk 10
Jerk Units % of Time
Merge Disabled
Merge Speed Current
Lock Position 0
Lock Direction 0
Event Distance 0
Calculated Data 0

EN
DN
ER
IP
PC

Second X move
Wrk_MI_Move2_1_X.PC

EM sequence step number

MOVE
Move
Source 11
Dest Wrk_EM_ProcedureStep 0

Step 11 - Spare step. Next step is step 1.

10

The Execute state is active.
Inp_MachineStateModel.Sts_Execute
<UN01_MachineStateModel.Sts_Execute>

EM sequence step number

EQ
Equal
Source A Wrk_EM_ProcedureStep 0
Source B 11

EM sequence step number

MOVE
Move
Source 1
Dest Wrk_EM_ProcedureStep 0

Last step example - turn on finished indication.

11

The Execute state is active.
Inp_MachineStateModel.Sts_Execute
<UN01_MachineStateModel.Sts_Execute>

AFI

EM sequence step number

EQ
Equal
Source A Wrk_EM_ProcedureStep 0
Source B 20

EM sequence finished
Wrk_EM_ProcedureDone

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

12

First X move
Wrk_MI_Move1_1_X.ER

MOVE
Move
Source Wrk_MI_Move1_1_X.ERR 0
Dest Wrk_EM_Procedure_MI_Err 0

MOVE
Move
Source Wrk_MI_Move1_1_X.EXERR 0
Dest Wrk_EM_Procedure_MI_ExErr 0

Second X move
Wrk_MI_Move2_1_X.ER

MOVE
Move
Source Wrk_MI_Move2_1_X.ERR 0
Dest Wrk_EM_Procedure_MI_Err 0

MOVE
Move
Source Wrk_MI_Move2_1_X.EXERR 0
Dest Wrk_EM_Procedure_MI_ExErr 0

First Z Move
Wrk_MI_Move1_2_Z.ER

MOVE
Move
Source Wrk_MI_Move1_2_Z.ERR 0
Dest Wrk_EM_Procedure_MI_Err 0

MOVE
Move
Source Wrk_MI_Move1_2_Z.EXERR 0
Dest Wrk_EM_Procedure_MI_ExErr 0

Second Z move
Wrk_MI_Move2_2_Z.ER

MOVE
Move
Source Wrk_MI_Move2_2_Z.ERR 0
Dest Wrk_EM_Procedure_MI_Err 0

MOVE
Move
Source Wrk_MI_Move2_2_Z.EXERR 0
Dest Wrk_EM_Procedure_MI_ExErr 0

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

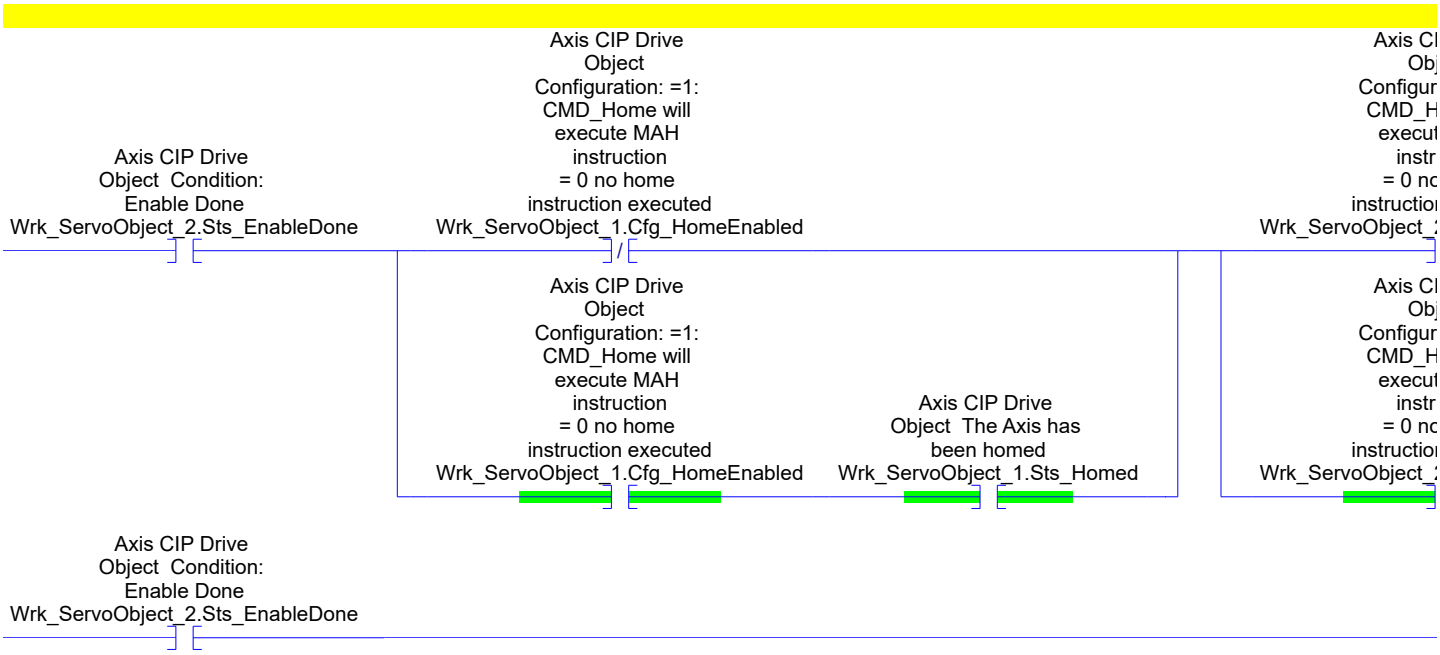
The Resetting state is active.
Inp_MachineStateModel.Sts_Resetting
<UN01_MachineStateModel.Sts_Resetting>

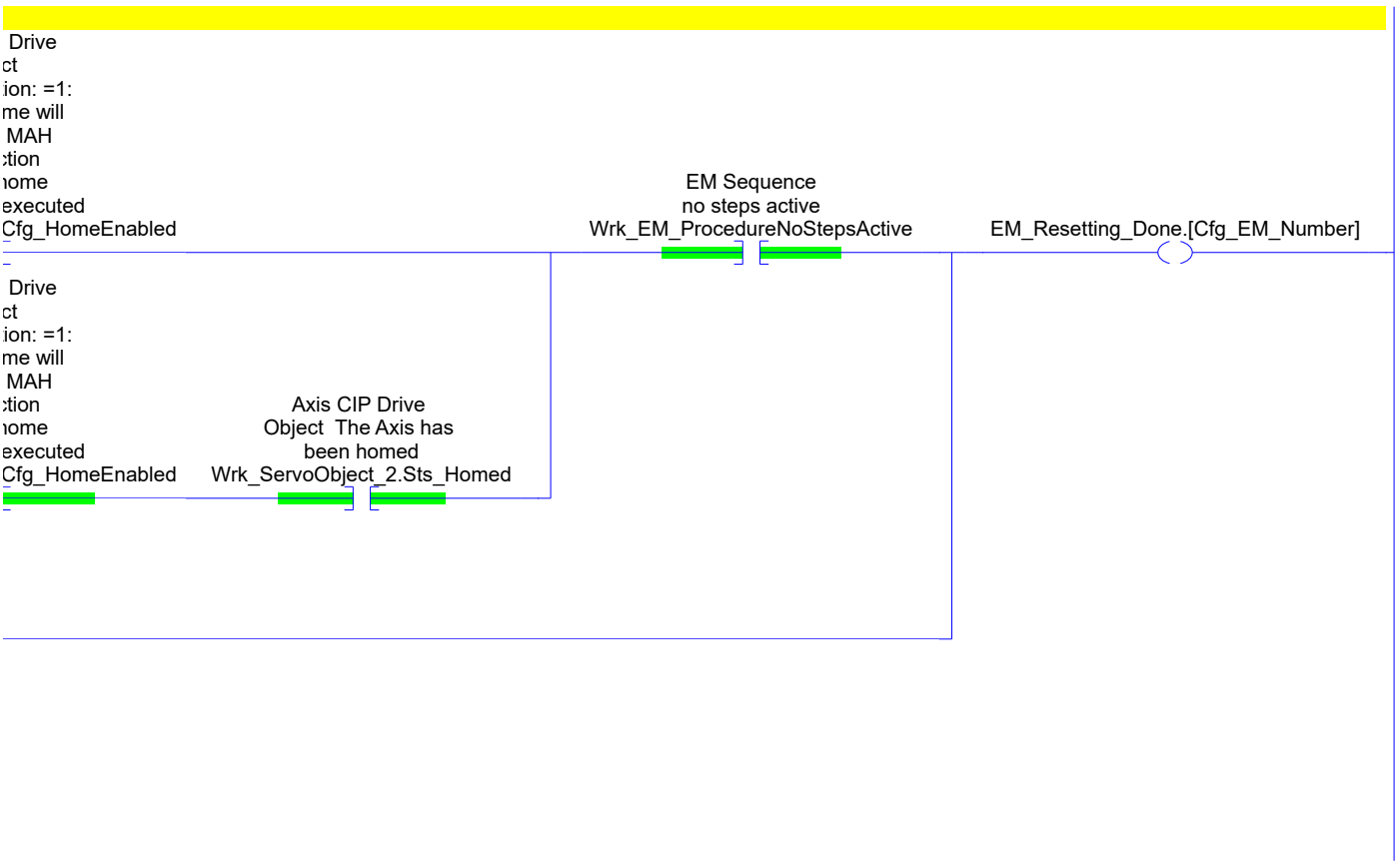
Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Produce
1

Axis CIP Drive Object Condition: Enable Done
Wrk_ServoObject_1.Sts_EnableDone

Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Manual
3

Axis CIP Drive Object Condition: Enable Done
Wrk_ServoObject_1.Sts_EnableDone


Axis CIP Drive Object Condition: Enable Done
Wrk_ServoObject_2.Sts_EnableDone
Axis CIP Drive Object Configuration: =1: CMD_Home will execute MAH instruction = 0 no home instruction executed
Wrk_ServoObject_1.Cfg_HomeEnabled
Axis CIP Drive Object The Axis has been homed
Wrk_ServoObject_1.Sts_Homed
Axis CIP Drive Object Condition: Enable Done
Wrk_ServoObject_2.Sts_EnableDone


EM Sequence no steps active
Wrk_EM_ProcedureNoStepsActive
EM_Resetting_Done.[Cfg_EM_Number]
Axis CIP Drive Object The Axis has been homed
Wrk_ServoObject_2.Sts_Homed

2

The Starting state is active.
Inp_MachineStateModel.Sts_Starting
<UN01_MachineStateModel.Sts_Starting>

Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Produce
1

Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Manual
3

EM_Starting_Done.[Cfg_EM_Number]

3

The Holding state is active.
Inp_MachineStateModel.Sts_Holding
<UN01_MachineStateModel.Sts_Holding>

Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Produce
1

EM_Holding_Done.[Cfg_EM_Number]

4

The Unholding state is active.
Inp_MachineStateModel.Sts_UnHolding
<UN01_MachineStateModel.Sts_UnHolding>

Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Produce
1

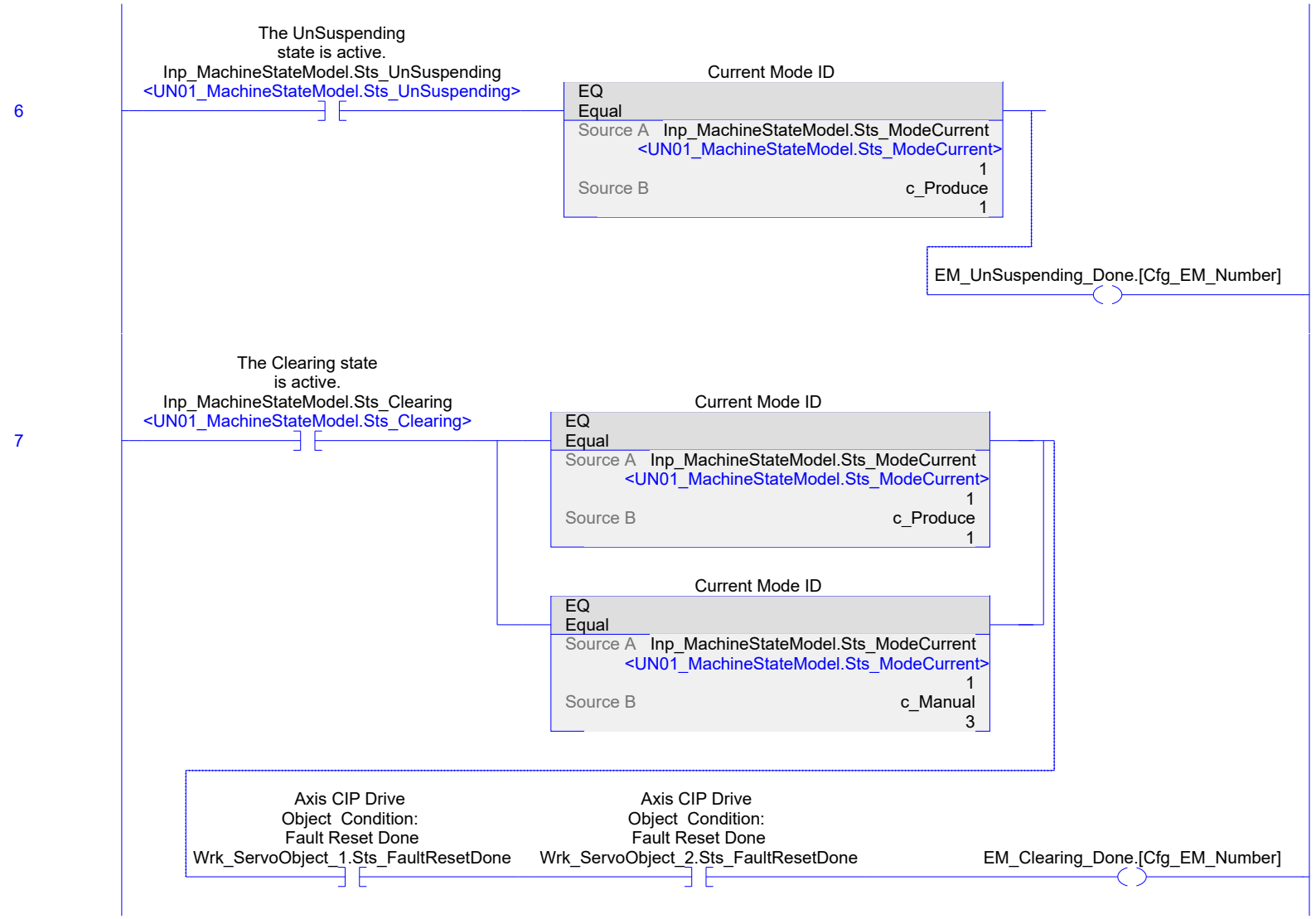
EM_UnHolding_Done.[Cfg_EM_Number]

5

The Suspending state is active.
Inp_MachineStateModel.Sts_Suspending
<UN01_MachineStateModel.Sts_Suspending>

Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Produce
1

EM_Suspending_Done.[Cfg_EM_Number]



8

The Stopping state is active.
Inp_MachineStateModel.Sts_Stopping
<UN01_MachineStateModel.Sts_Stopping>

Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Produce
1

Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Manual
3

Axis CIP Drive
Object Condition:
Stopping Done
Wrk_ServoObject_1.Sts_StopDone

Axis CIP Drive
Object Condition:
Stopping Done
Wrk_ServoObject_2.Sts_StopDone

Axis CIP Drive
Object Condition:
Disable Done
Wrk_ServoObject_1.Sts_DisableDone

Axis CIP Drive
Object Condition:
Disable Done
Wrk_ServoObject_2.Sts_DisableDone

EM_Stopping_Done.[Cfg_EM_Number]

9

The Aborting state is active.
Inp_MachineStateModel.Sts_Aborting
<UN01_MachineStateModel.Sts_Aborting>

Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Produce
1

Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Manual
3

Axis CIP Drive
Object Condition:
Aborting Done
Wrk_ServoObject_1.Sts_AbortDone

Axis CIP Drive
Object Condition:
Aborting Done
Wrk_ServoObject_2.Sts_AbortDone

EM_Aborting_Done.[Cfg_EM_Number]

***** Added transition out of Execute

10

The Execute state is active.
Inp_MachineStateModel.Sts_Execute
<UN01_MachineStateModel.Sts_Execute>

Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Produce
1

EM sequence finished
Wrk_EM_ProcedureDone

EM_Execute_Done.[Cfg_EM_Number]

***** Added transition out of Completing

11

The Completing state is active.
Inp_MachineStateModel.Sts_Completing
<UN01_MachineStateModel.Sts_Completing>

Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Produce
1

EM_Completing_Done.[Cfg_EM_Number]

THIS SECTION PROVIDE STATUS INFORMATIONS

12

Axis CIP Drive Object AverageVelocity within ZeroSpeedTolerance and no MotionStatus set
Wrk_ServoObject_1.Sts_NoMotion

Axis CIP Drive Object AverageVelocity within ZeroSpeedTolerance and no MotionStatus set
Wrk_ServoObject_2.Sts_NoMotion

EM_No_Motion.[Cfg_EM_Number]

(End)

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

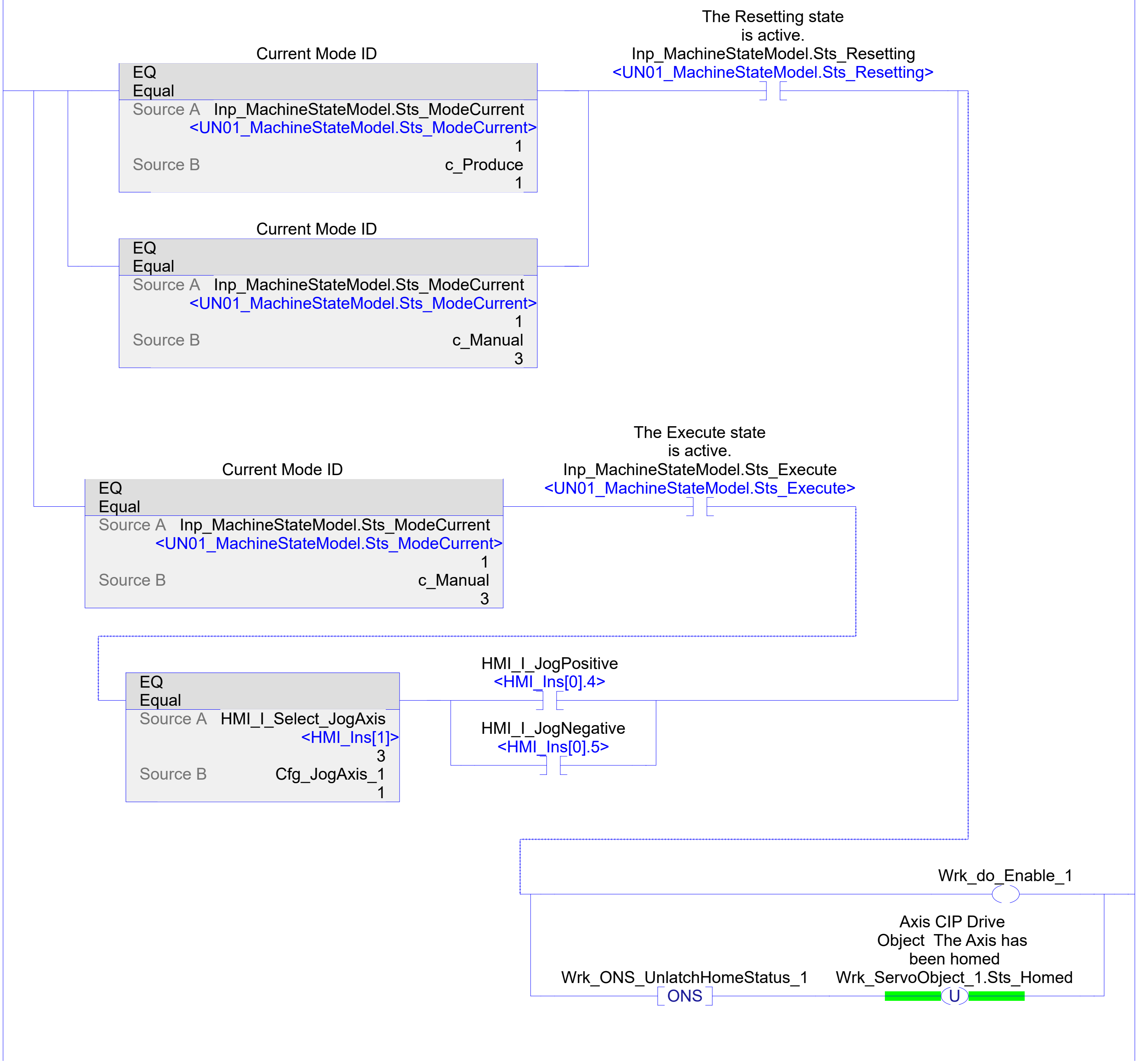
Version Comments: Deleted rung 1 in original CM02_ServoAxisObject getting motion status from master axis
Moved rungs dealing with command inputs to Axis_ObjectCD AOI from PP example CM00_Procedure into here.
Added "_1" suffix to axis-related tags in preparation to add second axis to EM

//

0 NOP

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

1



Homing logic

2

Current Mode ID

EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Produce
1

The Resetting state is active.
Inp_MachineStateModel.Sts_Resetting
<UN01_MachineStateModel.Sts_Resetting>

Ref_ServoAxis_1.ServoActionStatus
<Axis_1_X.ServoActionStatus>

Axis CIP Drive Object The Axis has been homed
Wrk_ServoObject_1.Sts_Homed

Wrk_do_Home_1

Stop logic

3

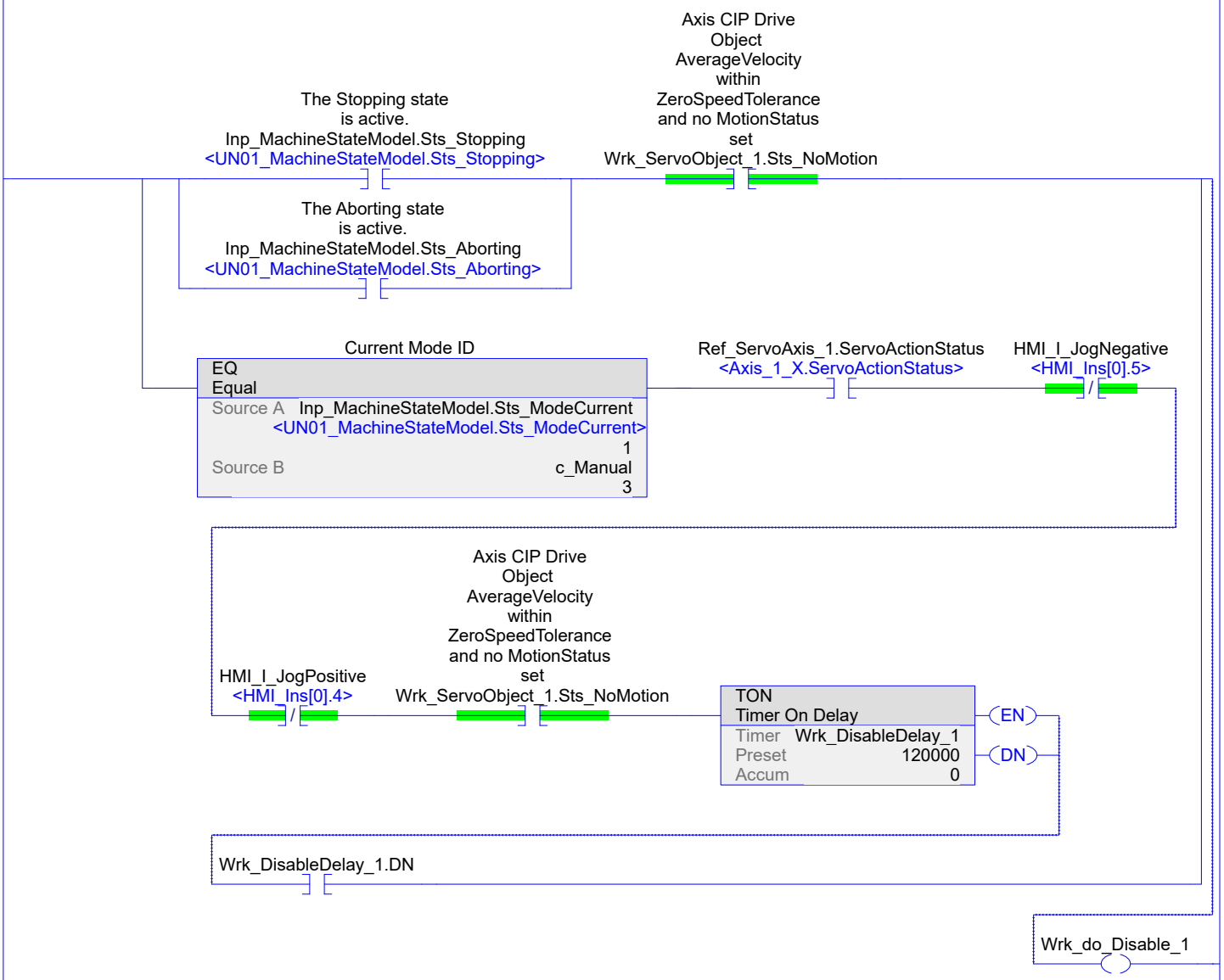
The Stopping state is active.
Inp_MachineStateModel.Sts_Stopping
<UN01_MachineStateModel.Sts_Stopping>

Axis CIP Drive Object AverageVelocity within ZeroSpeedTolerance and no MotionStatus set
Wrk_ServoObject_1.Sts_NoMotion

Wrk_do_Stop_1

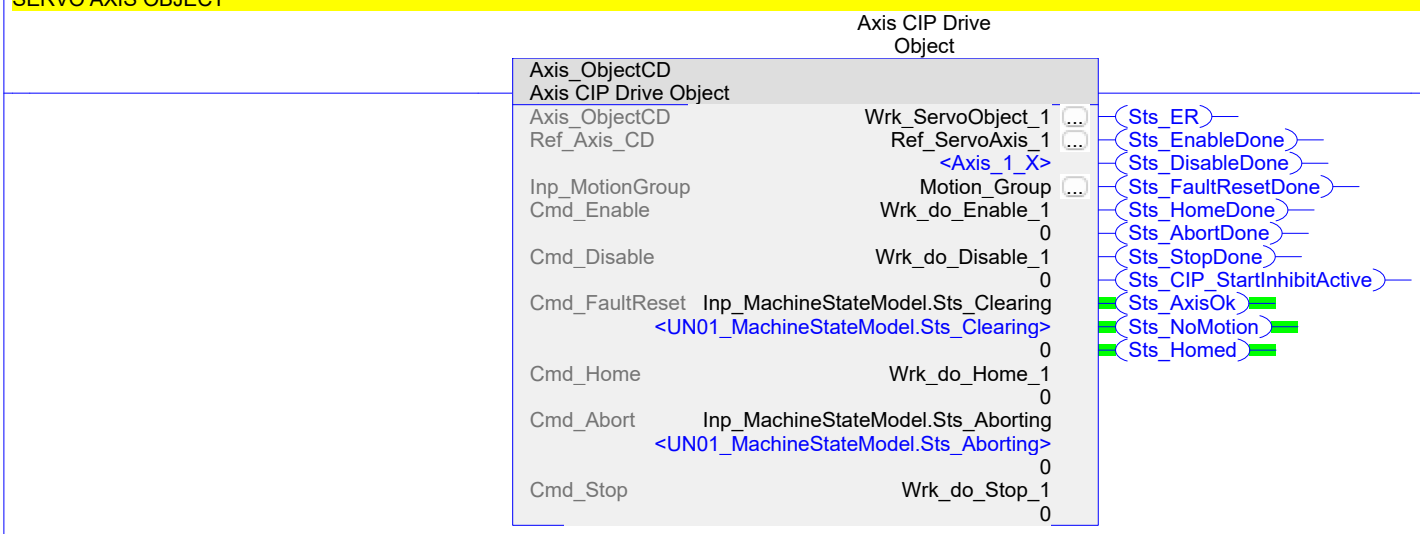
Disable logic for produce and manual (jogging). Disable if jogging inactive for 2 minutes.

4



SERVO AXIS OBJECT

5



(End)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////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
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

////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
```

0

NOP

1

Current Mode ID

EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Produce
1

The Resetting state
is active.
Inp_MachineStateModel.Sts_Resetting
<UN01_MachineStateModel.Sts_Resetting>

Current Mode ID

EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Manual
3

Current Mode ID

EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Manual
3

The Execute state
is active.
Inp_MachineStateModel.Sts_Execute
<UN01_MachineStateModel.Sts_Execute>

EQ
Equal
Source A HMI_I_Select_JogAxis
<HMI_Ins[1]>
3
Source B Cfg_JogAxis_2
2

HMI_I_JogPositive
<HMI_Ins[0].4>

HMI_I_JogNegative
<HMI_Ins[0].5>

Wrk_do_Enable_2

Axis CIP Drive
Object The Axis has
been homed

Wrk_ONS_UnlatchHomeStatus_2 ONS

Wrk_ServoObject_2.Sts_Homed U

2

Current Mode ID

EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Produce
1

The Resetting state is active.
Inp_MachineStateModel.Sts_Resetting
<UN01_MachineStateModel.Sts_Resetting>

Ref_ServoAxis_2.ServoActionStatus
<Axis_2_Z.ServoActionStatus>

Axis CIP Drive Object The Axis has been homed
Wrk_ServoObject_2.Sts_Homed

Wrk_do_Home_2

3

The Stopping state is active.
Inp_MachineStateModel.Sts_Stopping
<UN01_MachineStateModel.Sts_Stopping>

Axis CIP Drive Object AverageVelocity within ZeroSpeedTolerance and no MotionStatus set
Wrk_ServoObject_2.Sts_NoMotion

Wrk_do_Stop_2

4

The Stopping state is active.
Inp_MachineStateModel.Sts_Stopping
<UN01_MachineStateModel.Sts_Stopping>

Axis CIP Drive Object AverageVelocity within ZeroSpeedTolerance and no MotionStatus set
Wrk_ServoObject_2.Sts_NoMotion

The Aborting state is active.
Inp_MachineStateModel.Sts_Aborting
<UN01_MachineStateModel.Sts_Aborting>

Current Mode ID

EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Manual
3

Ref_ServoAxis_2.ServoActionStatus
<Axis_2_Z.ServoActionStatus>

HMI_I_JogNegative
<HMI_Ins[0].5>

Axis CIP Drive Object AverageVelocity within ZeroSpeedTolerance and no MotionStatus set
Wrk_ServoObject_2.Sts_NoMotion

HMI_I_JogPositive
<HMI_Ins[0].4>

TON
Timer On Delay
Timer Wrk_DisableDelay_2
Preset 120000
Accum 0
EN
DN

Wrk_DisableDelay_2.DN

Wrk_do_Disable_2

SERVO AXIS OBJECT

5

Axis CIP Drive Object

Axis_ObjectCD Axis CIP Drive Object		
Axis_ObjectCD	Wrk_ServoObject_2 ...	Sts_ER
Ref_Axis_CD	Ref_ServoAxis_2 ...	Sts_EnableDone
	<Axis_2_Z>	Sts_DisableDone
Inp_MotionGroup	Motion_Group ...	Sts_FaultResetDone
Cmd_Enable	Wrk_do_Enable_2	Sts_HomeDone
	0	Sts_AbortDone
Cmd_Disable	Wrk_do_Disable_2	Sts_StopDone
	0	Sts_CIP_StartInhibitActive
Cmd_FaultReset	Inp_MachineStateModel.Sts_Clearing	Sts_AxisOk
	<UN01_MachineStateModel.Sts_Clearing>	Sts_NoMotion
	0	Sts_Homed
Cmd_Home	Wrk_do_Home_2	
	0	
Cmd_Abort	Inp_MachineStateModel.Sts_Aborting	
	<UN01_MachineStateModel.Sts_Aborting>	
	0	
Cmd_Stop	Wrk_do_Stop_2	
	0	

(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

1

Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Manual
3

The Execute state
is active.
Inp_MachineStateModel.Sts_Execute
<UN01_MachineStateModel.Sts_Execute>

EQ
Equal
Source A HMI_I_Select_JogAxis
<HMI_Ins[1]>
3
Source B Cfg_JogAxis_1
1

Wrk_JogPermissive_1

JOG SERVO AXIS

2

Wrk_JogPermissive_1

Ref_ServoAxis_1.ServoActionStatus
<Axis_1_X.ServoActionStatus>

HMI_I_JogPositive
<HMI_Ins[0].4>

HMI_I_JogNegative
<HMI_Ins[0].5>

MOVE
Move
Source 0
Dest Wrk_JogDirection_1
1

HMI_I_JogNegative
<HMI_Ins[0].5>

HMI_I_JogPositive
<HMI_Ins[0].4>

MOVE
Move
Source 1
Dest Wrk_JogDirection_1
1

MAJ
Motion Axis Jog

Axis	Ref_ServoAxis_1 <Axis_1_X>
Motion Control	Wrk_MI_StartManualJog_1
Direction	Wrk_JogDirection_1 1
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

EN
DN
ER
IP

STOP SERVO AXIS

3

HMI_I_JogPositive <HMI_Ins[0].4> / HMI_I_JogNegative <HMI_Ins[0].5> / Wrk_MI_StartManualJog_1.IP

HMI_I_JogPositive <HMI_Ins[0].4> HMI_I_JogNegative <HMI_Ins[0].5>

Wrk_JogPermissive_1 /

MAS Motion Axis Stop

Axis	Ref_ServoAxis_1 <Axis_1_X>	EN, DN, ER, IP, PC
Motion Control	Wrk_MI_StopManualJog_1	
Stop Type	All	
Change Decel	Yes	
Decel Rate	Par_Jog_Decel 300	
Decel Units	Units per sec2	
Change Decel Jerk	No	
Decel Jerk	100	
Jerk Units	% of Time	

FAULT RESET

4

The Clearing state is active. Inp_MachineStateModel.Sts_Clearing <UN01_MachineStateModel.Sts_Clearing>

Wrk_MI_StartManualJog_1.ER (U)

Wrk_MI_StopManualJog_1.ER (U)

5

Wrk_MI_StartManualJog_1.ER / Wrk_MI_StopManualJog_1.ER

The Clearing state is active. Inp_MachineStateModel.Sts_Clearing <UN01_MachineStateModel.Sts_Clearing> /

Jog instr error for axis 1 - X Wrk_JogFault_1

6

Wrk_MI_StartManualJog_1.ER

1 for Start Fault, 2 for Stop Fault

MOVE Move

Source	1
Dest	Wrk_JogFault_Sts_Err_1 0

MI .ERR value

MOVE Move

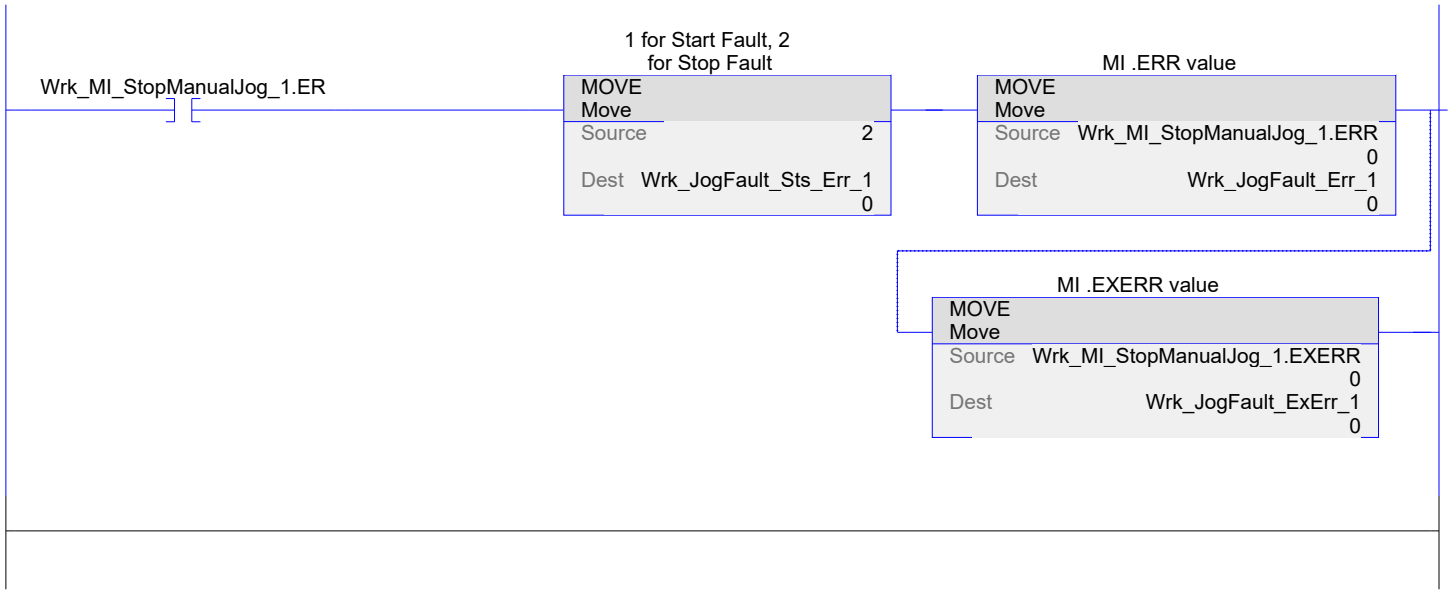
Source	Wrk_MI_StartManualJog_1.ERR 0
Dest	Wrk_JogFault_Err_1 0

MI .EXERR value

MOVE Move

Source	Wrk_MI_StartManualJog_1.EXERR 0
Dest	Wrk_JogFault_ExErr_1 0

7


Wrk_MI_StopManualJog_1.ER
1 for Start Fault, 2 for Stop Fault
MOVE
Move
Source 2
Dest Wrk_JogFault_Sts_Err_1 0
MI .ERR value
MOVE
Move
Source Wrk_MI_StopManualJog_1.ERR 0
Dest Wrk_JogFault_Err_1 0
MI .EXERR value
MOVE
Move
Source Wrk_MI_StopManualJog_1.EXERR 0
Dest Wrk_JogFault_ExErr_1 0

(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

1
Current Mode ID
EQ
Equal
Source A Inp_MachineStateModel.Sts_ModeCurrent
<UN01_MachineStateModel.Sts_ModeCurrent>
1
Source B c_Manual
3

The Execute state
is active.
Inp_MachineStateModel.Sts_Execute
<UN01_MachineStateModel.Sts_Execute>

EQ
Equal
Source A HMI_I_Select_JogAxis
<HMI_Ins[1]>
3
Source B Cfg_JogAxis_2
2

Wrk_JogPermissive_2

JOG SERVO AXIS

2

Wrk_JogPermissive_2

Ref_ServoAxis_2.ServoActionStatus
<Axis_2_Z.ServoActionStatus>

HMI_I_JogPositive
<HMI_Ins[0].4>

HMI_I_JogNegative
<HMI_Ins[0].5>

MOVE
Move
Source 0
Dest Wrk_JogDirection_2
0

HMI_I_JogNegative
<HMI_Ins[0].5>

HMI_I_JogPositive
<HMI_Ins[0].4>

MOVE
Move
Source 1
Dest Wrk_JogDirection_2
0

MAJ
Motion Axis Jog

Axis	Ref_ServoAxis_2 <Axis_2_Z>
Motion Control	Wrk_MI_StartManualJog_2
Direction	Wrk_JogDirection_2 0
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

EN
DN
ER
IP

STOP SERVO AXIS

3

HMI_I_JogPositive <HMI_Ins[0].4> / HMI_I_JogNegative <HMI_Ins[0].5> / Wrk_MI_StartManualJog_2.IP

HMI_I_JogPositive <HMI_Ins[0].4> HMI_I_JogNegative <HMI_Ins[0].5>

Wrk_JogPermissive_2 /

MAS Motion Axis Stop

Axis	Ref_ServoAxis_2 <Axis_2_Z>
Motion Control	Wrk_MI_StopManualJog_2
Stop Type	All
Change Decel	Yes
Decel Rate	Par_Jog_Decel 300
Decel Units	Units per sec2
Change Decel Jerk	No
Decel Jerk	100
Jerk Units	% of Time

EN DN ER IP PC

FAULT RESET

4

The Clearing state is active. Inp_MachineStateModel.Sts_Clearing <UN01_MachineStateModel.Sts_Clearing>

Wrk_MI_StartManualJog_2.ER (U) Wrk_MI_StopManualJog_2.ER (U)

5

Wrk_MI_StartManualJog_2.ER / The Clearing state is active. Inp_MachineStateModel.Sts_Clearing <UN01_MachineStateModel.Sts_Clearing>

Wrk_MI_StopManualJog_2.ER

EM Sequence move instr error for axis 2 - Z Wrk_JogFault_2

6

Wrk_MI_StartManualJog_2.ER

1 for Start Fault, 2 for Stop Fault

MOVE Move

Source	1
Dest	Wrk_JogFault_Sts_Err_2 0

MI .ERR value

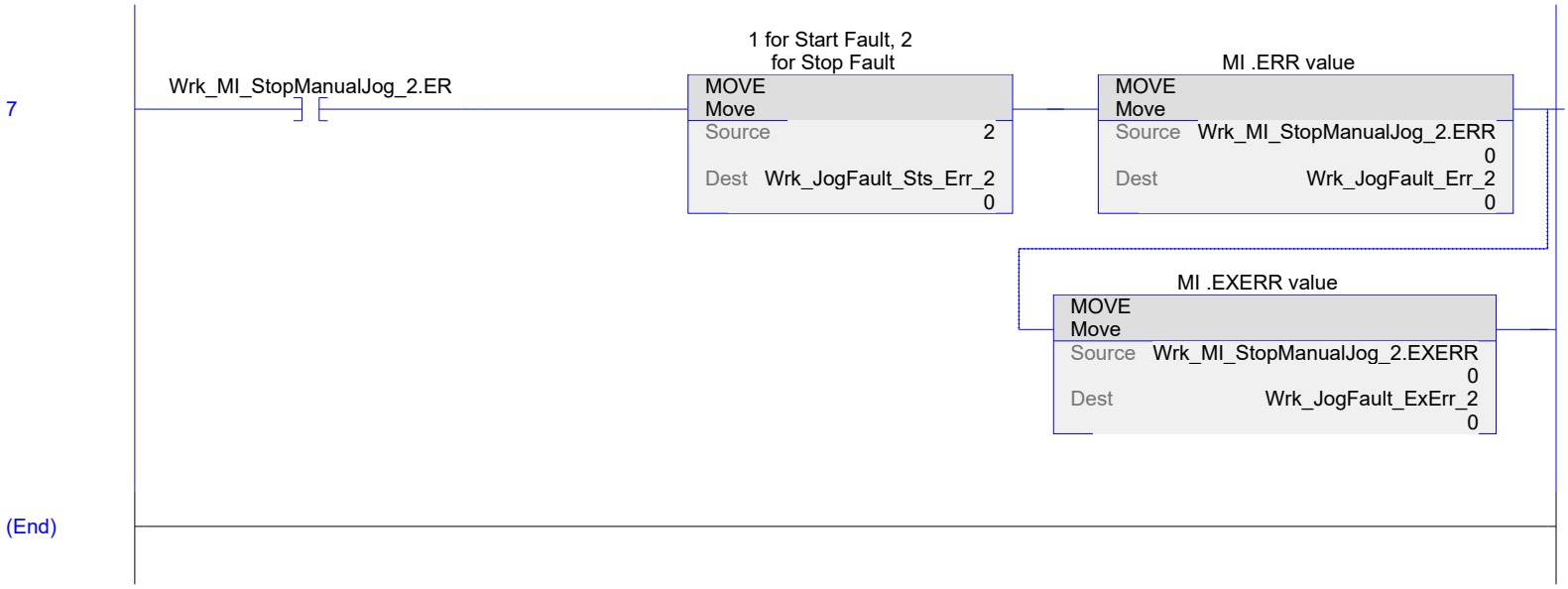
MOVE Move

Source	Wrk_MI_StartManualJog_2.ERR 0
Dest	Wrk_JogFault_Err_2 0

MI .EXERR value

MOVE Move

Source	Wrk_MI_StartManualJog_2.EXERR 0
Dest	Wrk_JogFault_ExErr_2 0



//

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

1 S:FS — JSR Jump To Subroutine, Routine Name SR20_Initialize

Set EM number to 1

EM Number

2 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]

3 ( )

Set axis numbers for jogging

HMI jog axis number for axis 1 - X

HMI jog axis number for axis 2 - Z

4 MOVE Move, Source 1, Dest Cfg_JogAxis_1 1 — MOVE Move, Source 2, Dest Cfg_JogAxis_2 2

5 JSR Jump To Subroutine, Routine Name CM00_Procedure

SERVO AXIS X AND IT`S LOGICAL FUNCTIONs

6

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_1_ServoAxisObject_X

7

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_1_ServoAxisJog_X

SERVO AXIS Z AND IT`S LOGICAL FUNCTIONs

8

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_2_ServoAxisObject_Z

9

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_2_ServoAxisJog_Z

Summary of EM conditions and status based on CM's

10

JSR
Jump To Subroutine
Routine Name CM01_EMConditions

Map axis faults to EM

11

JSR
Jump To Subroutine
Routine Name SR03_FaultHandler

12

JSR
Jump To Subroutine
Routine Name SR30_Simulate

(End)

Simple fault handler for EM

0

NOP

Map axis errors, procedure motion instruction errors, and jogging errors into bits of EM_MajorFaults

If instruction fault in Axis_Object AOI, or in EM procedure, also save location of error and .ERR and .EXERR fields of instruction causing fault. Only save info for

1

Axis CIP Drive Object Any Fault occured on this Axis
Wrk_ServoObject_1.Sts_ER

Axis CIP Drive Object Any instruction within the AOI faulted
Wrk_ServoObject_1.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_1.Err_MI_Err
0
Dest EM_Fault[Cfg_EM_Number].MI_Err
0

st fault after resetting.

All the Fault bits
related an Equipment
EM_Fault[Cfg_EM_Number].EM_MajorFaults.0
L

All the Fault bits
related an Equipment

VE	
ve	
urce	Wrk_ServoObject_1.Sts_Err
	0
st	EM_Fault[Cfg_EM_Number].Sts_MotionErr
	0

All the Fault bits
related an Equipment

MOVE	
Move	
Source	Wrk_ServoObject_1.Err_MI_ExErr
	0
Dest	EM_Fault[Cfg_EM_Number].MI_Exerr
	0

2

Axis CIP Drive
Object Any Fault
occured on this Axis
Wrk_ServoObject_2.Sts_ER

Axis CIP Drive
Object Any
instruction within
the AOI faulted
Wrk_ServoObject_2.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_2.Err_MI_Err
	0
Dest	EM_Fault[Cfg_EM_Number].MI_Err
	0

All the Fault bits
related an Equipment
EM_Fault[Cfg_EM_Number].EM_MajorFaults.1
L

All the Fault bits
related an Equipment
)VE
ve
urce Wrk_ServoObject_2.Sts_Err
0
st EM_Fault[Cfg_EM_Number].Sts_MotionErr
0

All the Fault bits
related an Equipment
MOVE
Move
Source Wrk_ServoObject_2.Err_MI_ExErr
0
Dest EM_Fault[Cfg_EM_Number].MI_Exerr
0

3

EM Sequence move
instr error
Wrk_EM_ProcedureFault

All the Fault bits
related an Equipment
EM_Fault[Cfg_EM_Number].EM_MajorFaults.2
L

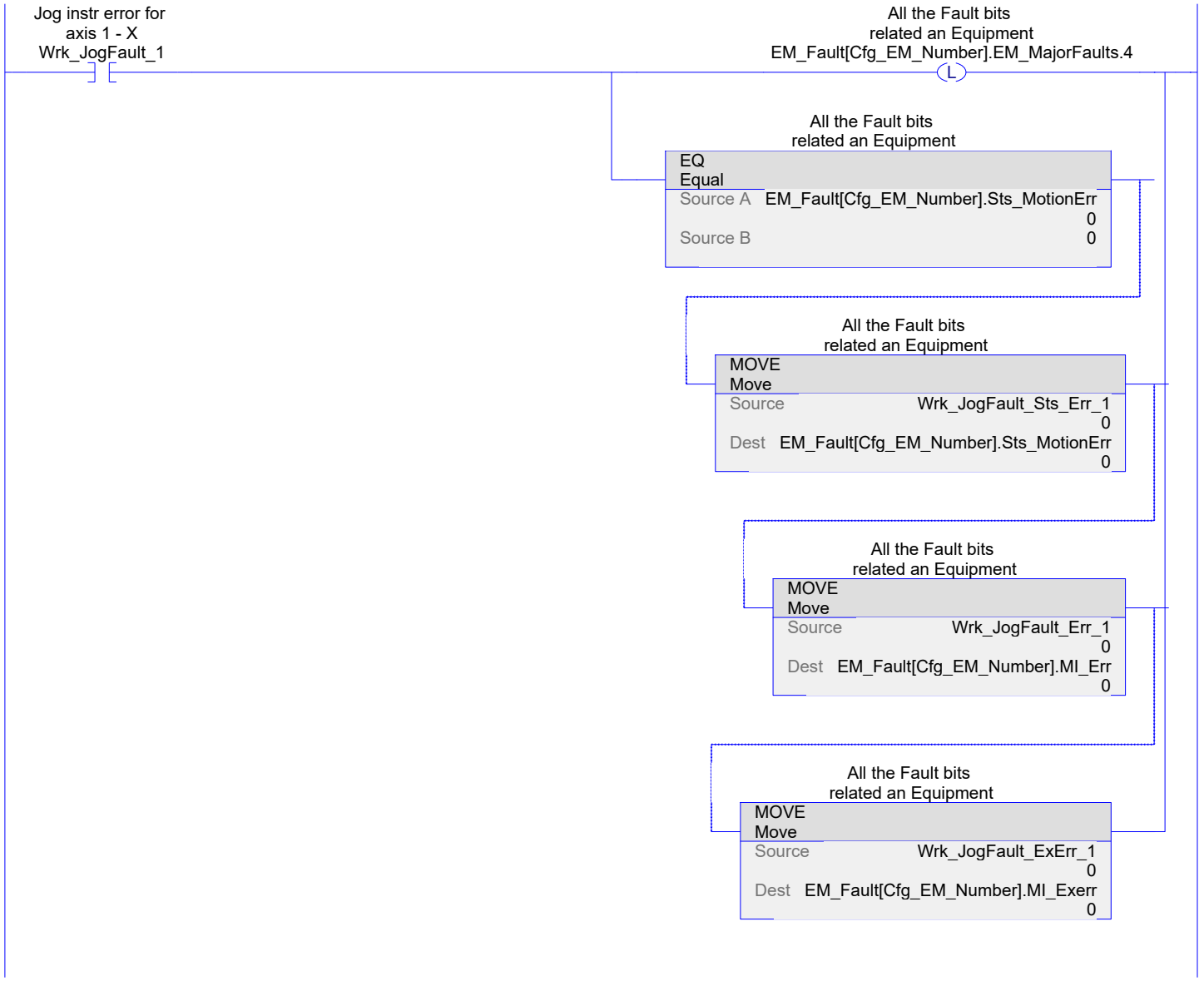
All the Fault bits
related an Equipment
EQ
Equal
Source A EM_Fault[Cfg_EM_Number].Sts_MotionErr
0
Source B 0

All the Fault bits
related an Equipment
MOVE
Move
Source Wrk_EM_ProcedureStep
0
Dest EM_Fault[Cfg_EM_Number].Sts_MotionErr
0

All the Fault bits
related an Equipment
MOVE
Move
Source Wrk_EM_Procedure_MI_Err
0
Dest EM_Fault[Cfg_EM_Number].MI_Err
0

All the Fault bits
related an Equipment
MOVE
Move
Source Wrk_EM_Procedure_MI_ExErr
0
Dest EM_Fault[Cfg_EM_Number].MI_Exerr
0

4



5

EM Sequence move instr error for axis 2 - Z
Wrk_JogFault_2

All the Fault bits related an Equipment
EM_Fault[Cfg_EM_Number].EM_MajorFaults.5
(L)

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_JogFault_Sts_Err_2 0
Dest EM_Fault[Cfg_EM_Number].Sts_MotionErr 0

All the Fault bits related an Equipment
MOVE Move
Source Wrk_JogFault_Err_2 0
Dest EM_Fault[Cfg_EM_Number].MI_Err 0

All the Fault bits related an Equipment
MOVE Move
Source Wrk_JogFault_ExErr_2 0
Dest EM_Fault[Cfg_EM_Number].MI_Exerr 0

***** Moved from CM04_ServoAxisGear

Watchdog for resetting - Create an error if timeout occurs

6

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

7

The Clearing state is active.
Inp_MachineStateModel.Sts_Clearing
<UN01_MachineStateModel.Sts_Clearing>

All the Fault bits related an Equipment
EM_Fault[Cfg_EM_Number].StartFaultWatchdog
(U)

All the Fault bits related an Equipment
MOVE
Move
Source 0
Dest EM_Fault[Cfg_EM_Number].EM_MajorFaults
0

All the Fault bits related an Equipment
MOVE
Move
Source 0
Dest EM_Fault[Cfg_EM_Number].EM_MinorFaults
0

All the Fault bits related an Equipment
MOVE
Move
Source 0
Dest EM_Fault[Cfg_EM_Number].EM_Warnings
0

All the Fault bits related an Equipment
MOVE
Move
Source 0
Dest EM_Fault[Cfg_EM_Number].Sts_MotionErr
0

All the Fault bits related an Equipment
MOVE
Move
Source 0
Dest EM_Fault[Cfg_EM_Number].MI_Err
0

All the Fault bits related an Equipment
MOVE
Move
Source 0
Dest EM_Fault[Cfg_EM_Number].MI_Exerr
0

***** Moved from CM04_ServoAxisGear

Watchdog fault bit

8

All the Fault bits related an Equipment
EM_Fault[Cfg_EM_Number].WatchdogPrepareExecution.DN

All the Fault bits related an Equipment
EM_Fault[Cfg_EM_Number].StartFaultWatchdog
(L)

Summary of EM faults

9

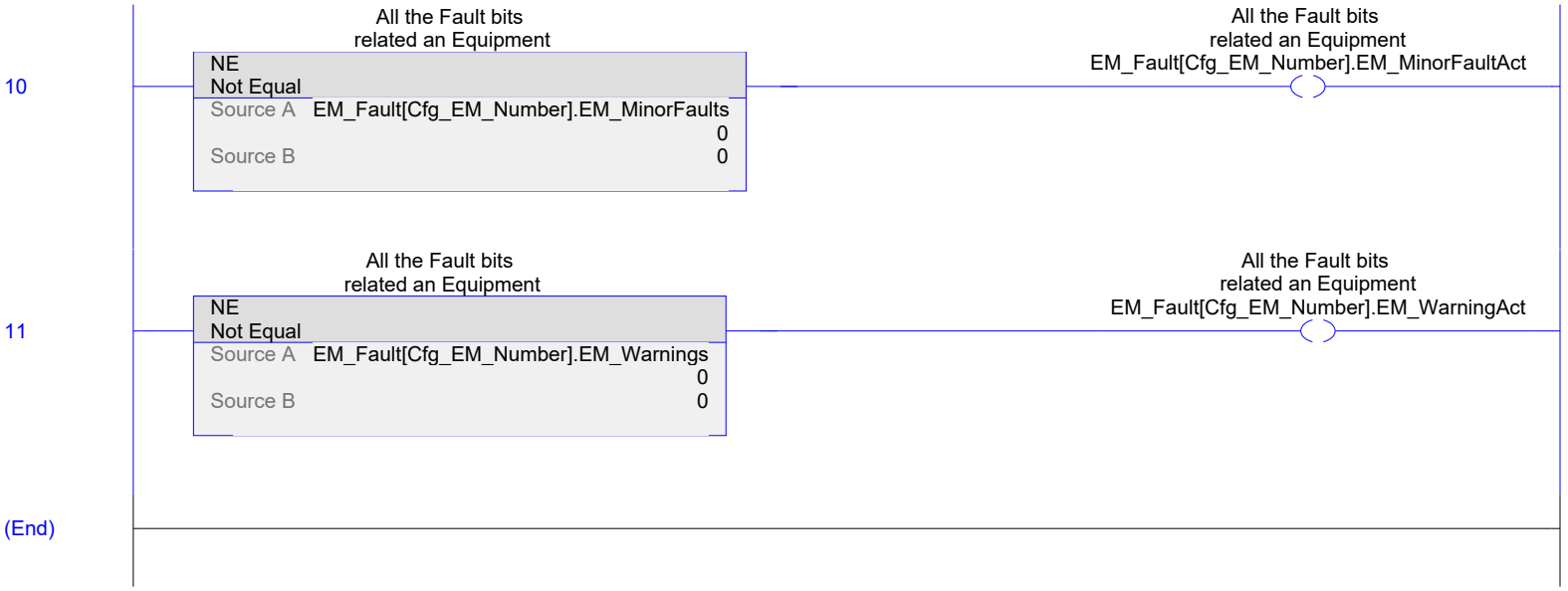
All the Fault bits related an Equipment
NE
Not Equal
Source A EM_Fault[Cfg_EM_Number].EM_MajorFaults
0
Source B 0

All the Fault bits related an Equipment
EM_Fault[Cfg_EM_Number].EM_MajorFaultAct
( )

All the Fault bits related an Equipment
EM_Fault[Cfg_EM_Number].StartFaultInstruction

All the Fault bits related an Equipment
EM_Fault[Cfg_EM_Number].StartFaultCalculation

All the Fault bits related an Equipment
EM_Fault[Cfg_EM_Number].StartFaultWatchdog



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

Version Comments:

//

0 [NOP]

1
Jog Speed — MOVE Move; Source 30; Dest Par_Jog_Speed 30
Jog acceleration — MOVE Move; Source 300; Dest Par_Jog_Accel 300
Jog deceleration — MOVE Move; Source 300; Dest Par_Jog_Decel 300

Clear EM procedure step

2
EM sequence step number — MOVE Move; Source 0; Dest Wrk_EM_ProcedureStep 0

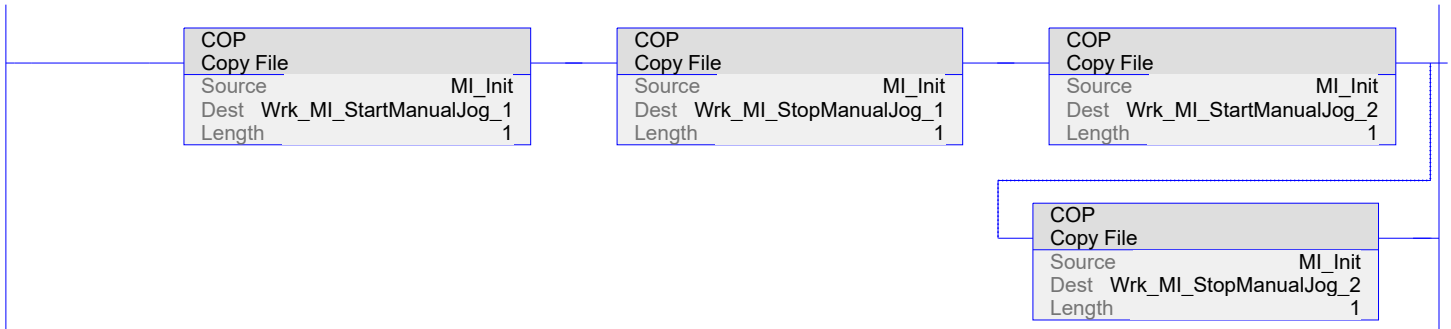
Both axes do not use a virtual master

3 [AFI]
Axis CIP Drive Object Configuration: =1: Abort, Stop will wait for Inp_MasterNoMotion before executing MAS instruction
Wrk_ServoObject_1.Cfg_UseVirtualMaster ( )
Axis CIP Drive Object Configuration: =1: Abort, Stop will wait for Inp_MasterNoMotion before executing MAS instruction
Wrk_ServoObject_2.Cfg_UseVirtualMaster ( )

Initialize motion instruction tags

4
First X move — COP Copy File; Source MI_Init; Dest Wrk_MI_Move1_1_X; Length 1
Second X move — COP Copy File; Source MI_Init; Dest Wrk_MI_Move2_1_X; Length 1
First Z Move — COP Copy File; Source MI_Init; Dest Wrk_MI_Move1_2_Z; Length 1
Second Z move — COP Copy File; Source MI_Init; Dest Wrk_MI_Move2_2_Z; Length 1

5



(End)

Simulate Cycle_Start and Cycle_Finish

0

NOP

Cycle_Start simulation - turn on when procedure step 1 for 2 secs

1

EM sequence step number

EQ
Equal
Source A Wrk_EM_ProcedureStep
0
Source B 1

TON
Timer On Delay
Timer Wrk_SimDelay1
Preset 2000
Accum 0

EN
DN

Wrk_SimDelay1.DN

Cycle_Start

Cycle_Finiah simulation - turn on when procedure step 4 for 4 secs

2

EM sequence step number

EQ
Equal
Source A Wrk_EM_ProcedureStep
0
Source B 4

TON
Timer On Delay
Timer Wrk_SimDelay2
Preset 4000
Accum 0

EN
DN

Wrk_SimDelay2.DN

Cycle_Finish

(End)

ESTOP function

0

ESTOP
Emergency Stop
ESTOP Estop1
Reset Type AUTOMATIC
Channel A EStop_1
<aentr:1:I.Pt00Data>
1
Channel B EStop_2
<aentr:1:I.Pt01Data>
1
Circuit Reset 1
Fault Reset 1
O1
CI
CRHO
II
FP

Light Curtain function

1

LC
Light Curtain
LC LightCurtain1
Reset Type AUTOMATIC
Channel A LC_1
<aentr:1:I.Pt02Data>
1
Channel B LC_2
<aentr:1:I.Pt03Data>
1
Input Filter Time 0
Mute Light Curtain LightCurtain1Mute
0
Circuit Reset 1
Fault Reset 1
O1
CI
CRHO
LCB
LCM
II
FP

2

Estop1.O1 LightCurtain1.O1

TOF
Timer Off Delay
Timer Sfty_STO_Delay
Preset 500
Accum 0
EN
DN

Sfty_STO_Delay.DN

Drive_STO_1 <aentr:2:O.Pt00Data>

Drive_STO_2 <aentr:2:O.Pt01Data>

Map block outputs to safety tags in controller memory

3

Estop1.O1 EStop1_O1

4

LightCurtain1.O1 LightCurtain1_O1

(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, 2024-09-10T00:30:53.458Z

Axis_ObjectCD v1.13

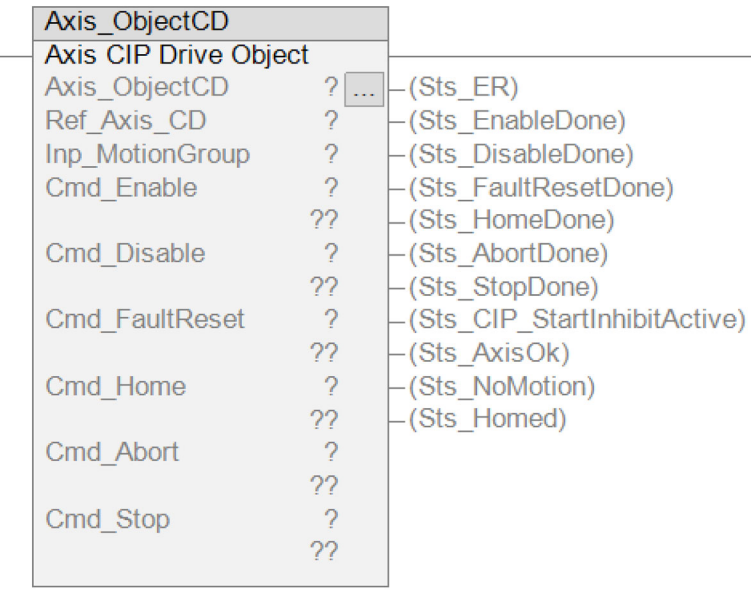
Rockwell Automation

Axis CIP Drive Object

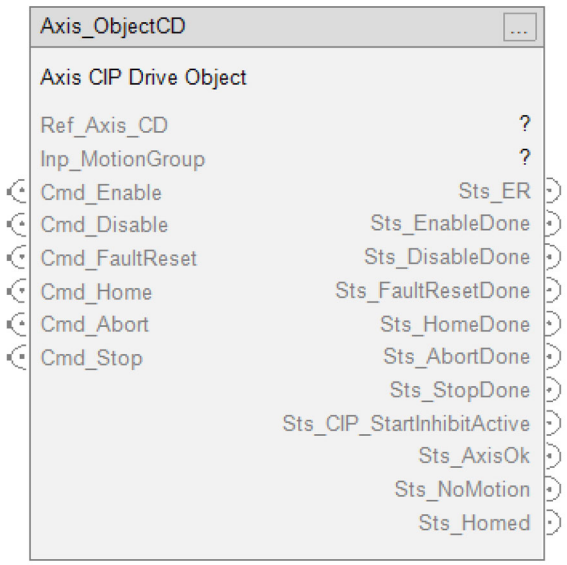
Class: Standard

Available Languages

Relay Ladder



Function Block



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.
==========

==========

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
Cfg_AbortEnabled	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		
Cfg_AbortEnabled - Axis_ObjectCD/Logic - 10(XIC), 11(XIC)			
Cfg_AbortRamp	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		
Cfg_AbortRamp - Axis_ObjectCD/Logic - 10(MOVE)			
Cfg_HMIFPDisplay	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		
*Cfg_HMIFPDisplay - Axis_ObjectCD/Logic - *20(MOVE)*			
Cfg_HomeEnabled	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		
Cfg_HomeEnabled - Axis_ObjectCD/Logic - 6(XIC), 9(XIC)			
Cfg_StopEnabled	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		
Cfg_StopEnabled - Axis_ObjectCD/Logic - 10(XIC), 11(XIC)			
Cfg_StopRamp	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		
Cfg_StopRamp - Axis_ObjectCD/Logic - 10(MOVE)			
Cfg_UseVirtualMaster	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		
Cfg_UseVirtualMaster - Axis_ObjectCD/Logic - 10(XIO)			

Cfg_ZeroSpeedTolerance 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
Cfg_ZeroSpeedTolerance - Axis_ObjectCD/Logic - 13(LE)

Cmd_Abort 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
Cmd_Abort - Axis_ObjectCD/Logic - 10(XIC), 11(XIC)

Cmd_Disable 0 BOOL Axis_ObjectCD
Disables the Axis
Usage: Input Parameter
Required: Yes
Visible: Yes
External Access: Read/Write
OPC UA Access: None
Cmd_Disable - Axis_ObjectCD/Logic - 2(XIO), 3(XIC)

Cmd_Enable 0 BOOL Axis_ObjectCD
Enables the Axis
Usage: Input Parameter
Required: Yes
Visible: Yes
External Access: Read/Write
OPC UA Access: None
Cmd_Enable - Axis_ObjectCD/Logic - 2(XIC)

Cmd_FaultReset 0 BOOL Axis_ObjectCD
Fault Reset
Usage: Input Parameter
Required: Yes
Visible: Yes
External Access: Read/Write
OPC UA Access: None
Cmd_FaultReset - Axis_ObjectCD/Logic - 4(XIC), 5(XIC), 5(XIO)

Cmd_Home 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
Cmd_Home - Axis_ObjectCD/Logic - 6(XIC), 9(XIC)

Cmd_Stop 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
Cmd_Stop - Axis_ObjectCD/Logic - 10(XIC), 11(XIC)

Err_DeviceCommunication 0 BOOL Axis_ObjectCD
Any General Fault
Usage: Output Parameter
Required: No
Visible: No
External Access: Read Only
OPC UA Access: None
*Err_DeviceCommunication - Axis_ObjectCD/Logic - *18(OTL), *18(OTL), *4(OTU)*
*Err_DeviceCommunication - Axis_ObjectCD/Prescan - *4(OTU)*

Err_FeedbackFault 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
*Err_FeedbackFault - Axis_ObjectCD/Logic - *18(OTL), *4(OTU)*
*Err_FeedbackFault - Axis_ObjectCD/Prescan - *4(OTU)*

Err_GuardFault 0 BOOL Axis_ObjectCD
Any Guard Fault (Safety Fault)
Usage: Output Parameter
Required: No
Visible: No
External Access: Read Only
OPC UA Access: None
*Err_GuardFault - Axis_ObjectCD/Logic - *18(OTL), *18(OTL), *4(OTU)*
*Err_GuardFault - Axis_ObjectCD/Prescan - *4(OTU)*

Err_InstructionFault 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
*Err_InstructionFault - Axis_ObjectCD/Logic - *17(OTL), *17(OTU), *4(OTU)*
*Err_InstructionFault - Axis_ObjectCD/Prescan - *4(OTU)*

Err_MI_Err 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
*Err_MI_Err - Axis_ObjectCD/Logic - *10(MOVE), *2(MOVE), *3(MOVE), *4(MOVE), *4(MOVE), *4(MOVE), *7(MOVE)*
*Err_MI_Err - Axis_ObjectCD/Prescan - *3(MOVE)*

Err_MI_ExErr 0 DINT Axis_ObjectCD
Motion instuction .EXERR field if fault
Usage: Output Parameter
Required: No
Visible: No
External Access: Read Only
OPC UA Access: None
*Err_MI_ExErr - Axis_ObjectCD/Logic - *10(MOVE), *2(MOVE), *3(MOVE), *4(MOVE), *4(MOVE), *4(MOVE), *7(MOVE)*
*Err_MI_ExErr - Axis_ObjectCD/Prescan - *3(MOVE)*

Err_NegOvertravel 0 BOOL Axis_ObjectCD
Any neagtive Overtravel Fault
Usage: Output Parameter

Err_NegOvertravel (Continued)
Required: No
Visible: No
External Access: Read Only
OPC UA Access: None
*Err_NegOvertravel - Axis_ObjectCD/Logic - *18(OTL), *4(OTU)*
*Err_NegOvertravel - Axis_ObjectCD/Prescan - *4(OTU)*

Err_PositionError 0 BOOL Axis_ObjectCD
Position Error window exceeded
Usage: Output Parameter
Required: No
Visible: No
External Access: Read Only
OPC UA Access: None
*Err_PositionError - Axis_ObjectCD/Logic - *18(OTL)*

Err_PosOvertravel 0 BOOL Axis_ObjectCD
Any positive Overtravel Fault
Usage: Output Parameter
Required: No
Visible: No
External Access: Read Only
OPC UA Access: None
*Err_PosOvertravel - Axis_ObjectCD/Logic - *18(OTL), *4(OTU)*
*Err_PosOvertravel - Axis_ObjectCD/Prescan - *4(OTU)*

Err_PowerFault 0 BOOL Axis_ObjectCD
Any Overload/Voltage Fault
Usage: Output Parameter
Required: No
Visible: No
External Access: Read Only
OPC UA Access: None
*Err_PowerFault - Axis_ObjectCD/Logic - *18(OTL), *4(OTU)*
*Err_PowerFault - Axis_ObjectCD/Prescan - *4(OTU)*

Err_TemperatureFault 0 BOOL Axis_ObjectCD
Any Temperature Fault
Usage: Output Parameter
Required: No
Visible: No
External Access: Read Only
OPC UA Access: None
*Err_TemperatureFault - Axis_ObjectCD/Logic - *18(OTL), *4(OTU)*
*Err_TemperatureFault - Axis_ObjectCD/Prescan - *4(OTU)*

Inp_MasterNoMotion 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
Inp_MasterNoMotion - Axis_ObjectCD/Logic - 10(XIC)

Inp_MotionGroup MOTION_GROUP Axis_ObjectCD
Motion Group
Usage: InOut Parameter
Required: Yes
Visible: Yes
OPC UA Access: None
Inp_MotionGroup.GroupStatus ?? DINT

Inp_MotionGroup (Continued)			
Motion Group			
Inp_MotionGroup.GroupStatus.1	??	BOOL	
Motion Group			
Inp_MotionGroup.InhibStatus	??	BOOL	
Motion Group			
Inp_MotionGroup.GroupSynced	??	BOOL	
Motion Group			
Inp_MotionGroup.GroupSynced - Axis_ObjectCD/Logic - 19(XIC)			
Inp_MotionGroup.AxisInhibitStatus	??	BOOL	
Motion Group			
Inp_MotionGroup.AxisTestModeStatus	??	BOOL	
Motion Group			
Inp_MotionGroup.GroupFault	??	DINT	
Motion Group			
Inp_MotionGroup.GroupOverlapFault	??	BOOL	
Motion Group			
Inp_MotionGroup.CSTLossFault	??	BOOL	
Motion Group			
Inp_MotionGroup.GroupTaskLoadingFault	??	BOOL	
Motion Group			
Inp_MotionGroup.ClockSyncFault	??	BOOL	
Motion Group			
Inp_MotionGroup.GroupAlarm	??	DINT	
Motion Group			
Inp_MotionGroup.ClockSyncAlarm	??	BOOL	
Motion Group			
Inp_MotionGroup.AxisFault	??	DINT	
Motion Group			
Inp_MotionGroup.PhysicalAxisFault	??	BOOL	
Motion Group			
Inp_MotionGroup.ModuleFault	??	BOOL	
Motion Group			
Inp_MotionGroup.ConfigFault	??	BOOL	
Motion Group			
Inp_MotionGroup.TaskMaxScanTime	??	DINT	
Motion Group			
Inp_MotionGroup.TaskLastScanTime	??	DINT	
Motion Group			
Inp_MotionGroup.TaskLastIOTime	??	DINT	
Motion Group			
Inp_MotionGroup.TaskMaxIOTime	??	DINT	
Motion Group			
Inp_MotionGroup.TaskAverageScanTime	??	DINT	
Motion Group			
Inp_MotionGroup.TaskAverageIOTime	??	DINT	
Motion Group			
Out_AxisCipState	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.ConfigUpdateInProcess	??	BOOL

Ref_Axis_CD (Continued)
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.InhibitStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.DirectControlStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.AxisUpdateStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotionStatus ?? DINT
Servo Axis, Data type Axis CIP Drive
Ref_Axis_CD.MotionStatus - Axis_ObjectCD/Logic - 13(MEQ)

Ref_Axis_CD.AccelStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.DecelStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MoveStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.JogStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.GearingStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.HomingStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.StoppingStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.AxisHomedStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.PositionCamStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.TimeCamStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.PositionCamPendingStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.TimeCamPendingStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.GearingLockStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.PositionCamLockStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.TimeCamLockStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MasterOffsetMoveStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.CoordinatedMotionStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.TransformStateStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ControlledByTransformStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.DirectVelocityControlStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.DirectTorqueControlStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD (Continued)

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

Ref_Axis_CD (Continued)

Ref_Axis_CD.OutputCamTransitionStatus ?? DINT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ActualPosition ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.StrobeActualPosition ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.StartActualPosition ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.AverageVelocity ?? REAL
Servo Axis, Data type Axis CIP Drive
Ref_Axis_CD.AverageVelocity - Axis_ObjectCD/Logic - 13(ABS)

Ref_Axis_CD.ActualVelocity ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ActualAcceleration ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.WatchPosition ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.Registration1Position ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.Registration1PositiveEdgePosition ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.Registration1NegativeEdgePosition ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.Registration2Position ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.Registration2PositiveEdgePosition ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.Registration2NegativeEdgePosition ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.Registration1Time ?? DINT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.Registration1PositiveEdgeTime ?? DINT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.Registration1NegativeEdgeTime ?? DINT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.Registration2Time ?? DINT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.Registration2PositiveEdgeTime ?? DINT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.Registration2NegativeEdgeTime ?? DINT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.InterpolationTime ?? DINT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.InterpolatedActualPosition ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.InterpolatedCommandPosition ?? REAL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MasterOffset ?? REAL

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

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

Ref_Axis_CD (Continued)

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

Ref_Axis_CD (Continued)
Servo Axis, Data type Axis CIP Drive

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

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

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

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

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

Ref_Axis_CD (Continued)

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

Ref_Axis_CD (Continued)

Ref_Axis_CD.GuardMaxAccelMonitorFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.GuardDirectionMonitorFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.GuardDoorMonitorInputFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.GuardDoorMonitorFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.GuardDoorControlOutputFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.GuardLockMonitorInputFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.GuardLockMonitorFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.GuardEnablingSwitchMonitorInputFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.GuardEnablingSwitchMonitorFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.GuardFeedback1VoltageMonitorFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.GuardFeedback2VoltageMonitorFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.CIPAxisState ?? INT
Servo Axis, Data type Axis CIP Drive
Ref_Axis_CD.CIPAxisState - Axis_ObjectCD/Logic - 1(MOVE), 16(EQ), 16(LIMIT), 18(LIMIT), 2(EQ)

Ref_Axis_CD.CIPAxisStatus ?? DINT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.LocalControlStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.AlarmStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.DCBusUpStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.PowerStructureEnabledStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorFluxUpStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.TrackingCommandStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.PositionLockStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.VelocityLockStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.VelocityStandstillStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.VelocityThresholdStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

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

Ref_Axis_CD (Continued)

?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineFrequencyChangeStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineSyncLossStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.SinglePhaseStatus ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.BusVoltageLimitStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.BusVoltageRateLimitStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ActiveCurrentRateLimitStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ReactiveCurrentRateLimitStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ReactivePowerLimitStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ReactivePowerRateLimitStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ActiveCurrentLimitStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ReactiveCurrentLimitStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotoringPowerLimitStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.RegenerativePowerLimitStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterThermalLimitStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.CIPAxisStatusRA ?? DINT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.TorqueNotchFilterFrequencyDetectedStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.TorqueNotchFilterTuneUnsuccessfulStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.TorqueNotchFilterMultipleFreqStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.TorqueNotchFilterFreqBelowLimitStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.TorqueNotchFilterFreqAboveLimitStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.AdaptiveTuneGainStabilizationStatus
?? BOOL

Ref_Axis_CD (Continued)
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.TestModeStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.CIPAxisStatus2RA	??	DINT
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.CIPAxisIOStatus	??	DINT
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.EnableInputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.HomeInputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.Registration1InputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.Registration2InputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.PositiveOvertravelInputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.NegativeOvertravelInputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.Feedback1ThermostatStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.ResistiveBrakeOutputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.MechanicalBrakeOutputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.MotorThermostatInputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.CIPAxisIOStatusRA	??	DINT
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.RegenerativePowerInputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.BusCapacitorInputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.ShuntThermalSwitchInputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.ContactorEnableOuputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.PreChargeInputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.ACLineContactorInputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.RegenerativePowerOutputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.BusConditionerModuleInputStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.ConverterInputStatus		

Ref_Axis_CD (Continued)

?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterOutputStatus
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.CIPAxisFaults ?? LINT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorOvercurrentFault
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorCommutationFault
?? BOOL
Servo Axis, Data type Axis CIP Drive
Ref_Axis_CD.MotorCommutationFault - Axis_ObjectCD/Logic - 18(XIC)

Ref_Axis_CD.MotorOverspeedFLFault
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorOverspeedULFault
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorOvertemperatureFLFault
?? BOOL
Servo Axis, Data type Axis CIP Drive
Ref_Axis_CD.MotorOvertemperatureFLFault - Axis_ObjectCD/Logic - 18(XIC)

Ref_Axis_CD.MotorOvertemperatureULFault
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorThermalOverloadFLFault
?? BOOL
Servo Axis, Data type Axis CIP Drive
Ref_Axis_CD.MotorThermalOverloadFLFault - Axis_ObjectCD/Logic - 18(XIC)

Ref_Axis_CD.MotorThermalOverloadULFault
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorPhaseLossFault
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.InverterOvercurrentFault
?? BOOL
Servo Axis, Data type Axis CIP Drive
Ref_Axis_CD.InverterOvercurrentFault - Axis_ObjectCD/Logic - 18(XIC)

Ref_Axis_CD.InverterOvertemperatureFLFault
?? BOOL
Servo Axis, Data type Axis CIP Drive
Ref_Axis_CD.InverterOvertemperatureFLFault - Axis_ObjectCD/Logic - 18(XIC)

Ref_Axis_CD.InverterOvertemperatureULFault
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.InverterThermalOverloadFLFault
?? BOOL
Servo Axis, Data type Axis CIP Drive
Ref_Axis_CD.InverterThermalOverloadFLFault - Axis_ObjectCD/Logic - 18(XIC)

Ref_Axis_CD.InverterThermalOverloadULFault
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterOvercurrentFault
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterGroundCurrentFLFault
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterGroundCurrentULFault

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

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

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

Ref_Axis_CD (Continued)

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

Ref_Axis_CD (Continued)

Ref_Axis_CD.PeripheralCommunicationFLFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.PeripheralCommunicationULFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.AdapterCommunicationFLFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.AdapterCommunicationULFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ExcessiveMotorVoltageFeedbackOffsetFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLinePhaseReversalFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.PhaseThermalImbalanceFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.DCBusVoltageImbalanceFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.PredictiveMaintenanceFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ProductSpecificFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.CIPAxisAlarms ?? LINT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorOvercurrentAlarm ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorCommutationAlarm ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorOverspeedFLAlarm ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorOverspeedULAlarm ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorOvertemperatureFLAlarm ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorOvertemperatureULAlarm ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorThermalOverloadFLAlarm ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorThermalOverloadULAlarm ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MotorPhaseLossAlarm ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.InverterOvercurrentAlarm ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.InverterOvertemperatureFLAlarm

Ref_Axis_CD (Continued)

?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.InverterOvertemperatureULAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.InverterThermalOverloadFLAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.InverterThermalOverloadULAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterOvercurrentAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterGroundCurrentFLAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterGroundCurrentULAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterOvertemperatureFLAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterOvertemperatureULAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterThermalOverloadFLAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterThermalOverloadULAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterACPowerLossAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterACSinglePhaseLossAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterACPhaseShortAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ConverterPreChargeAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.BusRegulatorOvertemperatureFLAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.BusRegulatorOvertemperatureULAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.BusRegulatorThermalOverloadFLAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.BusRegulatorThermalOverloadULAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.BusRegulatorAlarm ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.BusModuleAlarm ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.BusUndervoltageFLAlarm
?? BOOL

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

Ref_Axis_CD (Continued)

?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ExcessiveBusVoltageErrorAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.AmbientTemperatureRiseAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.IllegalControlModeAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.EnableInputDeactivatedAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ControllerInitiatedAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ExternalInputAlarm ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.CIPAxisAlarms2 ?? LINT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineOvervoltageFLAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineOvervoltageULAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineUndervoltageFLAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineUndervoltageULAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineHighFrequencyFLAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineHighFrequencyULAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineLowFrequencyFLAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineLowFrequencyULAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineVoltageUnbalanceAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineCurrentUnbalanceAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineVoltageSagAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineFrequencyChangeAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineSyncLossAlarm
?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.ACLineSyncFailureAlarm
?? BOOL

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

Ref_Axis_CD (Continued)
Servo Axis, Data type Axis CIP Drive

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

Ref_Axis_CD (Continued)

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

Ref_Axis_CD (Continued)

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

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

Ref_Axis_CD.SafeTorqueOffActiveStatus		
	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SafeTorqueDisabledStatus		
	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SBCActiveStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SBCEngagedStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SS1ActiveStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SS2ActiveStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SOSActiveStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SOSStandstillStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SMTActiveStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SMTOvertemperatureStatus		
	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SSMActiveStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SSMStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SLSActiveStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SLSLimitStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SLAActiveStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SLALimitStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SDIActiveStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SDILimitStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SafePositiveMotionStatus		
	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SafeNegativeMotionStatus		
	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SCAActiveStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SCAStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SLPActiveStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SLPLimitStatus	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SafetyOutputConnectionClosedStatus		
	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SafetyOutputConnectionIdleStatus		
	??	BOOL
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.AxisSafetyStatusRA	??	DINT
Servo Axis, Data type Axis CIP Drive		
Ref_Axis_CD.SafeBrakeIntegrityStatus		

Ref_Axis_CD (Continued)

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

Ref_Axis_CD (Continued)
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.FeedbackIntegrityLossAPRFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.FeedbackPositionRangeChangedAPRFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.CIPAPRFaultsRA ?? INT
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.PersistentMediaAPRFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.FirmwareErrorAPRFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.FeedbackBatteryLossAPRFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MoverSequencingWithoutReferenceAPRFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Ref_Axis_CD.MoverAssignmentSequenceChangedAPRFault ?? BOOL
Servo Axis, Data type Axis CIP Drive

Sts_AbortDone 0 BOOL Axis_ObjectCD
Condition: Aborting Done
Usage: Output Parameter
Required: No
Visible: Yes
External Access: Read Only
OPC UA Access: None
*Sts_AbortDone - Axis_ObjectCD/Logic - *11(OTE)*

Sts_AbsoluteReferenceStatus 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
*Sts_AbsoluteReferenceStatus - Axis_ObjectCD/Logic - *14(OTE)*

Sts_AxisOk 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
*Sts_AxisOk - Axis_ObjectCD/Logic - *19(OTE)*

Sts_CIP_StartInhibitActive 0 BOOL Axis_ObjectCD
Usage: Output Parameter
Required: No
Visible: Yes
External Access: Read Only
OPC UA Access: None
*Sts_CIP_StartInhibitActive - Axis_ObjectCD/Logic - *15(OTE), 16(XIC)*

Sts_DisableDone 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 occured 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)*

Sts_NoMotion 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
*Sts_NoMotion - Axis_ObjectCD/Logic - *13(OTE), 11(XIC)*

Sts_StopDone 0 BOOL Axis_ObjectCD
Condition: Stopping Done
Usage: Output Parameter
Required: No
Visible: Yes
External Access: Read Only
OPC UA Access: None
*Sts_StopDone - Axis_ObjectCD/Logic - *11(OTE)*

Name	Default	Data Type	Scope
Err_MAFRFault	0	BOOL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Err_MAFRFault - Axis_ObjectCD/Prescan - *4(OTU)*			
Err_MAHFault	0	BOOL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Err_MAHFault - Axis_ObjectCD/Prescan - *4(OTU)*			
Err_MASFault	0	BOOL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Err_MASFault - Axis_ObjectCD/Prescan - *4(OTU)*			
Err_MASRFault	0	BOOL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Err_MASRFault - Axis_ObjectCD/Prescan - *4(OTU)*			
Err_MSFFault	0	BOOL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Err_MSFFault - Axis_ObjectCD/Prescan - *4(OTU)*			
Err_MSOFault	0	BOOL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Err_MSOFault - Axis_ObjectCD/Prescan - *4(OTU)*			
Wrk_DecelRate	0.0	REAL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Wrk_DecelRate - Axis_ObjectCD/Logic - *10(MOVE), *10(MOVE), 10(MAS)*			
Wrk_ER_ONS	0	BOOL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Wrk_ER_ONS - Axis_ObjectCD/Logic - *20(ONS)*			
Wrk_FaultReset_delay		TIMER	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Wrk_FaultReset_delay - Axis_ObjectCD/Logic - *5(TON)*			
Wrk_FaultReset_delay.DN	0	BOOL	
Wrk_FaultReset_delay.DN - Axis_ObjectCD/Logic - 5(XIC)			
Wrk_HomeSequence	0	DINT	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Wrk_HomeSequence - Axis_ObjectCD/Logic - *6(MOVE), *7(MOVE), *8(MOVE), 7(EQ), 8(EQ)*			
*Wrk_HomeSequence - Axis_ObjectCD/Prescan - *2(MOVE)*			

Wrk_MI_Disable		MOTION_INSTRUCTION	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Wrk_MI_Disable - Axis_ObjectCD/Logic - *3(MSF)*			
*Wrk_MI_Disable - Axis_ObjectCD/Prescan - *1(COP)*			
Wrk_MI_Disable.DN	0	BOOL	
Wrk_MI_Disable.DN - Axis_ObjectCD/Logic - 3(XIC)			
Wrk_MI_Disable.ER	0	BOOL	
Wrk_MI_Disable.ER - Axis_ObjectCD/Logic - 3(XIC), 3(XIC)			
Wrk_MI_Disable.ERR	0	INT	
Wrk_MI_Disable.ERR - Axis_ObjectCD/Logic - 3(MOVE)			
Wrk_MI_Disable.EXERR	0	SINT	
Wrk_MI_Disable.EXERR - Axis_ObjectCD/Logic - 3(MOVE)			
Wrk_MI_Enable		MOTION_INSTRUCTION	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Wrk_MI_Enable - Axis_ObjectCD/Logic - *2(MSO)*			
*Wrk_MI_Enable - Axis_ObjectCD/Prescan - *1(COP)*			
Wrk_MI_Enable.ER	0	BOOL	
Wrk_MI_Enable.ER - Axis_ObjectCD/Logic - 2(XIC)			
Wrk_MI_Enable.ERR	0	INT	
Wrk_MI_Enable.ERR - Axis_ObjectCD/Logic - 2(MOVE)			
Wrk_MI_Enable.EXERR	0	SINT	
Wrk_MI_Enable.EXERR - Axis_ObjectCD/Logic - 2(MOVE)			
Wrk_MI_FaultReset		MOTION_INSTRUCTION	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Wrk_MI_FaultReset - Axis_ObjectCD/Logic - *4(MAFR)*			
*Wrk_MI_FaultReset - Axis_ObjectCD/Prescan - *1(COP)*			
Wrk_MI_FaultReset.ER	0	BOOL	
Wrk_MI_FaultReset.ER - Axis_ObjectCD/Logic - 4(XIC)			
Wrk_MI_FaultReset.ERR	0	INT	
Wrk_MI_FaultReset.ERR - Axis_ObjectCD/Logic - 4(MOVE)			
Wrk_MI_FaultReset.EXERR	0	SINT	
Wrk_MI_FaultReset.EXERR - Axis_ObjectCD/Logic - 4(MOVE)			
Wrk_MI_Home		MOTION_INSTRUCTION	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
*Wrk_MI_Home - Axis_ObjectCD/Logic - *7(MAH)*			
*Wrk_MI_Home - Axis_ObjectCD/Prescan - *1(COP)*			
Wrk_MI_Home.ER	0	BOOL	
Wrk_MI_Home.ER - Axis_ObjectCD/Logic - 7(XIC)			
Wrk_MI_Home.PC	0	BOOL	
Wrk_MI_Home.PC - Axis_ObjectCD/Logic - 8(XIC)			
Wrk_MI_Home.ERR	0	INT	
Wrk_MI_Home.ERR - Axis_ObjectCD/Logic - 7(MOVE)			
Wrk_MI_Home.EXERR	0	SINT	
Wrk_MI_Home.EXERR - Axis_ObjectCD/Logic - 7(MOVE)			
Wrk_MI_Init		MOTION_INSTRUCTION	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		
Wrk_MI_Init - Axis_ObjectCD/Prescan - 1(COP), 1(COP), 1(COP), 1(COP), 1(COP), 1(COP)			
Wrk_MI_Init.FLAGS	0	DINT	
*Wrk_MI_Init.FLAGS - Axis_ObjectCD/Prescan - *1(MOVE)*			

Wrk_MI_Init (Continued)
Wrk_MI_Init.ERR 0 INT
*Wrk_MI_Init.ERR - Axis_ObjectCD/Prescan - *1(MOVE)*
Wrk_MI_Init.STATUS 0 SINT
*Wrk_MI_Init.STATUS - Axis_ObjectCD/Prescan - *1(MOVE)*
Wrk_MI_Init.STATE 0 SINT
*Wrk_MI_Init.STATE - Axis_ObjectCD/Prescan - *1(MOVE)*
Wrk_MI_Init.SEGMENT 0 DINT
*Wrk_MI_Init.SEGMENT - Axis_ObjectCD/Prescan - *1(MOVE)*
Wrk_MI_Init.EXERR 0 SINT
*Wrk_MI_Init.EXERR - Axis_ObjectCD/Prescan - *1(MOVE)*

Wrk_MI_ShutdownReset MOTION_INSTRUCTION Axis_ObjectCD
Usage: Local Tag
External Access: None
OPC UA Access: None
*Wrk_MI_ShutdownReset - Axis_ObjectCD/Logic - *4(MASR)*
*Wrk_MI_ShutdownReset - Axis_ObjectCD/Prescan - *1(COP)*
Wrk_MI_ShutdownReset.ER 0 BOOL
Wrk_MI_ShutdownReset.ER - Axis_ObjectCD/Logic - 4(XIC)
Wrk_MI_ShutdownReset.ERR 0 INT
Wrk_MI_ShutdownReset.ERR - Axis_ObjectCD/Logic - 4(MOVE)
Wrk_MI_ShutdownReset.EXERR 0 SINT
Wrk_MI_ShutdownReset.EXERR - Axis_ObjectCD/Logic - 4(MOVE)

Wrk_MI_Stop MOTION_INSTRUCTION Axis_ObjectCD
Usage: Local Tag
External Access: None
OPC UA Access: None
*Wrk_MI_Stop - Axis_ObjectCD/Logic - *10(MAS)*
*Wrk_MI_Stop - Axis_ObjectCD/Prescan - *1(COP)*
Wrk_MI_Stop.ER 0 BOOL
Wrk_MI_Stop.ER - Axis_ObjectCD/Logic - 10(XIC)
Wrk_MI_Stop.ERR 0 INT
Wrk_MI_Stop.ERR - Axis_ObjectCD/Logic - 10(MOVE)
Wrk_MI_Stop.EXERR 0 SINT
Wrk_MI_Stop.EXERR - Axis_ObjectCD/Logic - 10(MOVE)

Wrk_MSFwatchdog TIMER Axis_ObjectCD
Usage: Local Tag
External Access: None
OPC UA Access: None
*Wrk_MSFwatchdog - Axis_ObjectCD/Logic - *3(TON)*
Wrk_MSFwatchdog.PRE 0 DINT
*Wrk_MSFwatchdog.PRE - Axis_ObjectCD/Logic - *3(MOVE)*
Wrk_MSFwatchdog.DN 0 BOOL
Wrk_MSFwatchdog.DN - Axis_ObjectCD/Logic - 3(XIC)

Wrk_MSOwatchdog TIMER Axis_ObjectCD
Usage: Local Tag
External Access: None
OPC UA Access: None
*Wrk_MSOwatchdog - Axis_ObjectCD/Logic - *2(TON)*
Wrk_MSOwatchdog.PRE 0 DINT
*Wrk_MSOwatchdog.PRE - Axis_ObjectCD/Logic - *2(MOVE)*
Wrk_MSOwatchdog.DN 0 BOOL
Wrk_MSOwatchdog.DN - Axis_ObjectCD/Logic - 2(XIC)

Wrk_ONS_HomeStart 0 BOOL Axis_ObjectCD
Usage: Local Tag
External Access: None
OPC UA Access: None
*Wrk_ONS_HomeStart - Axis_ObjectCD/Logic - *6(ONS)*

Wrk_ONS_HomeStart (Continued)
*Wrk_ONS_HomeStart - Axis_ObjectCD/Prescan - *2(OTU)*

Wrk_ONS_Init	0	BOOL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	None		
OPC UA Access:	None		

*Wrk_ONS_Init - Axis_ObjectCD/Logic - *4(ONS)*

Wrk_Velocity	0.0	REAL	Axis_ObjectCD
Usage:	Local Tag		
External Access:	Read/Write		
OPC UA Access:	None		

*Wrk_Velocity - Axis_ObjectCD/Logic - *13(ABS), 13(LE)*

//
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

//

0 [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

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

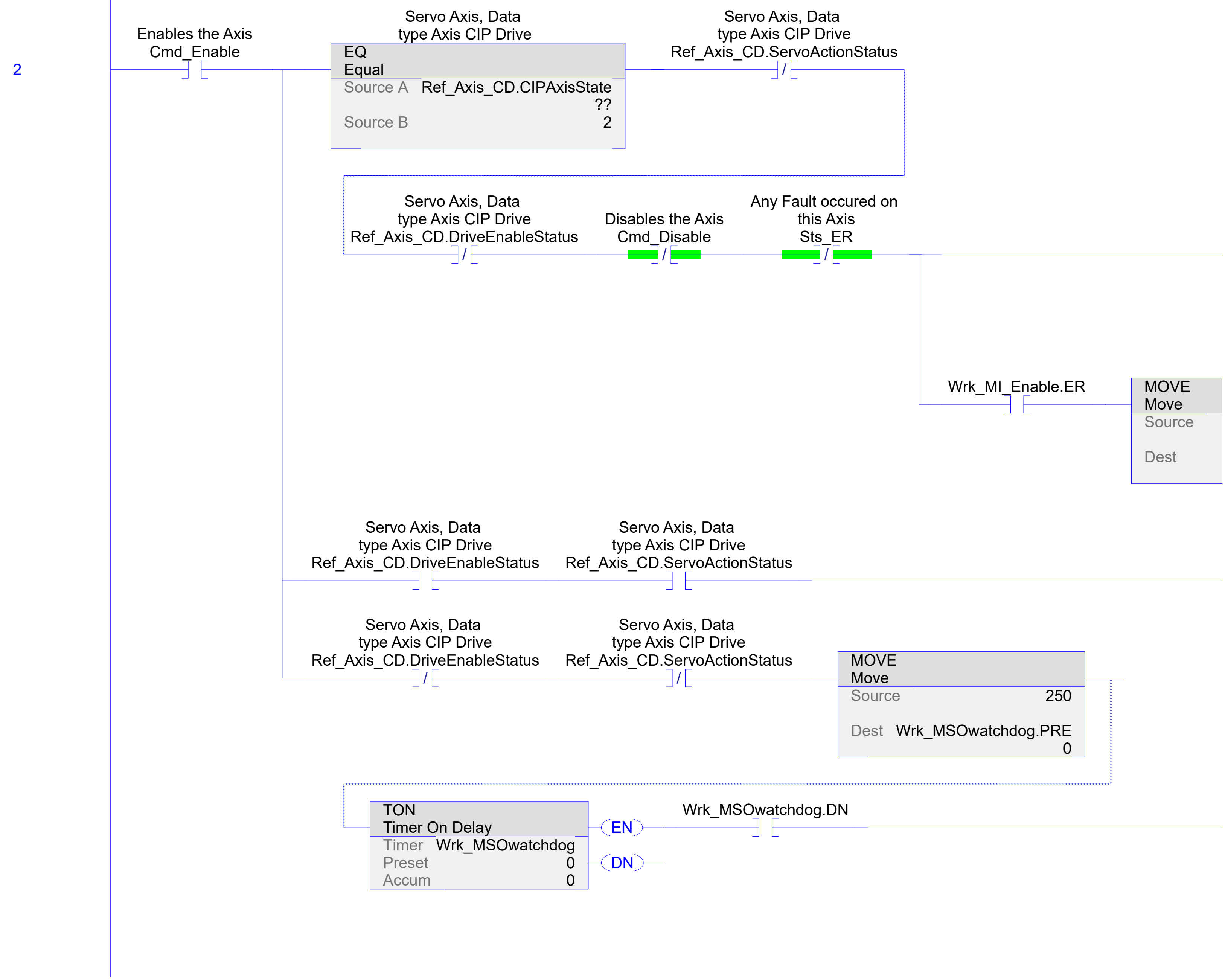
//

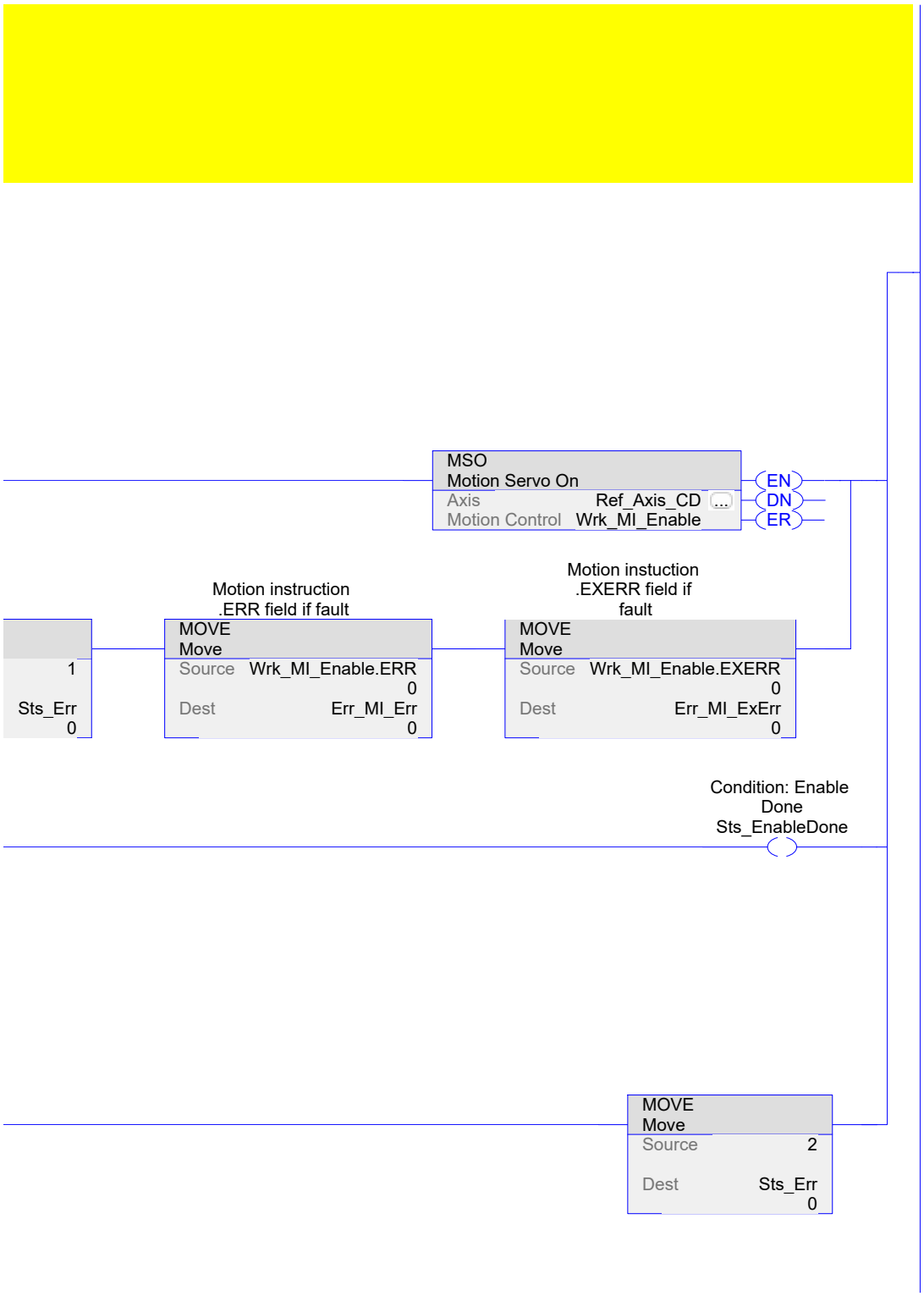
- SECTION AXIS ENABLE

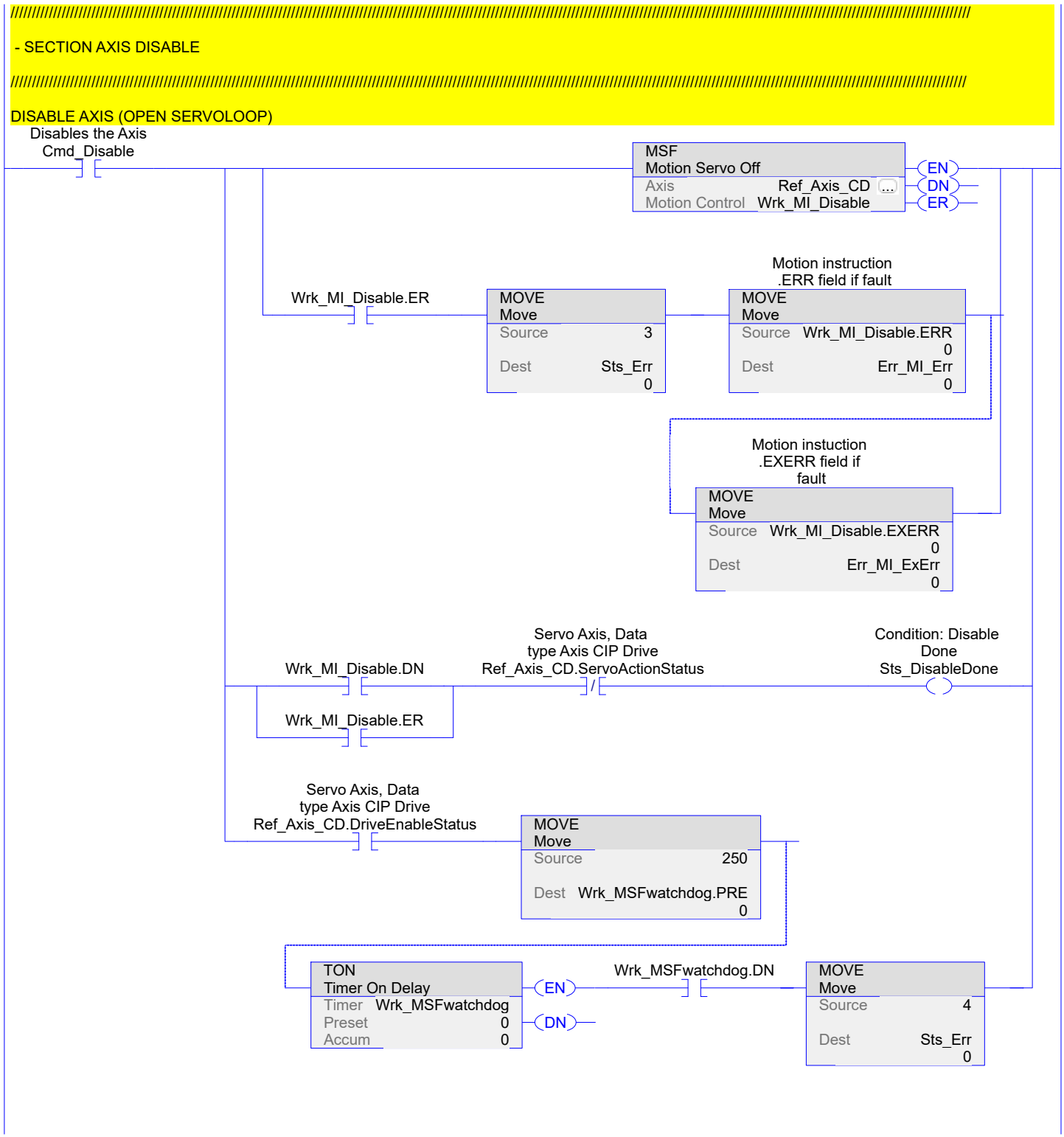
//

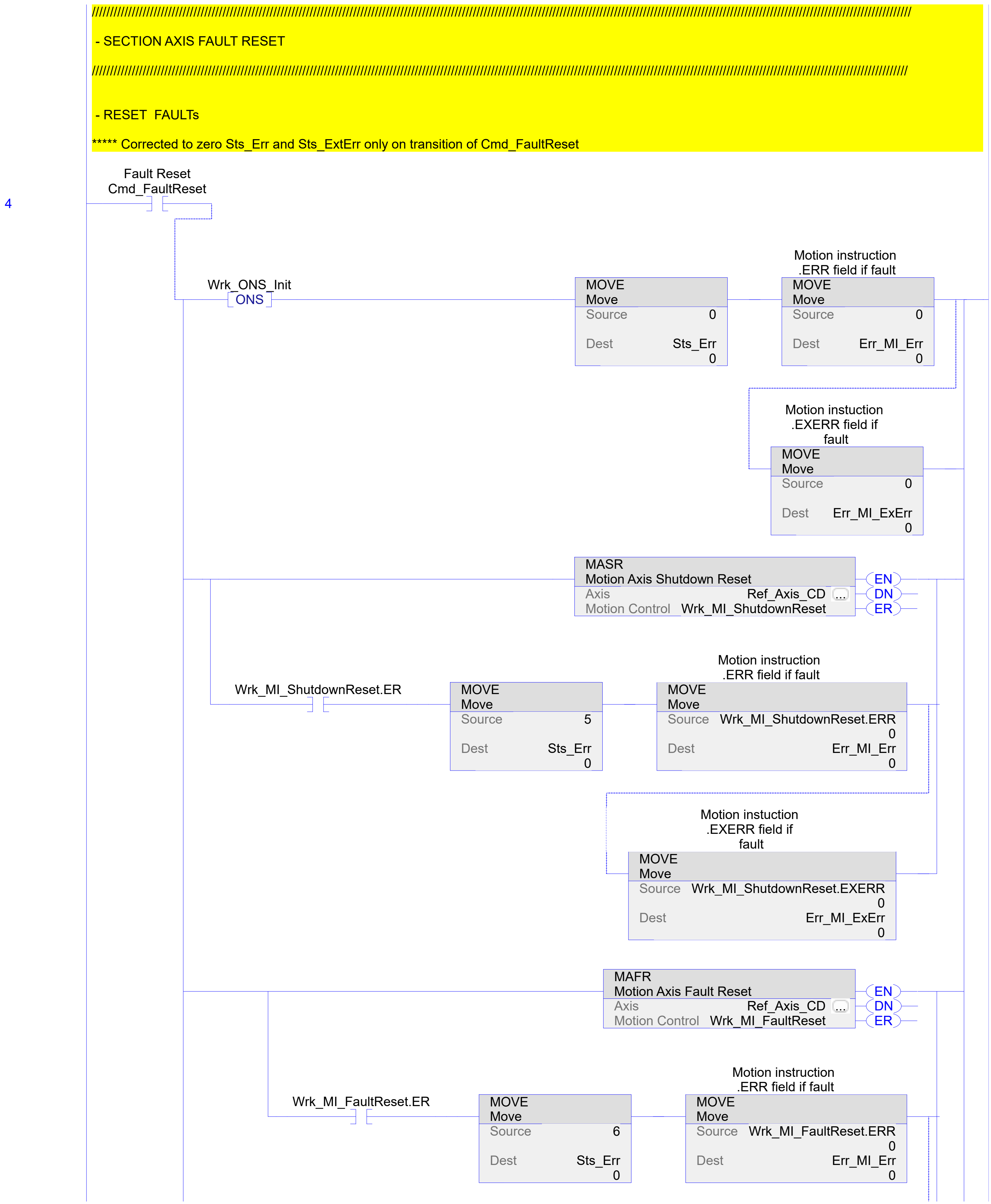
ENABLE AXIS (CLOSE SERVOLOOP)

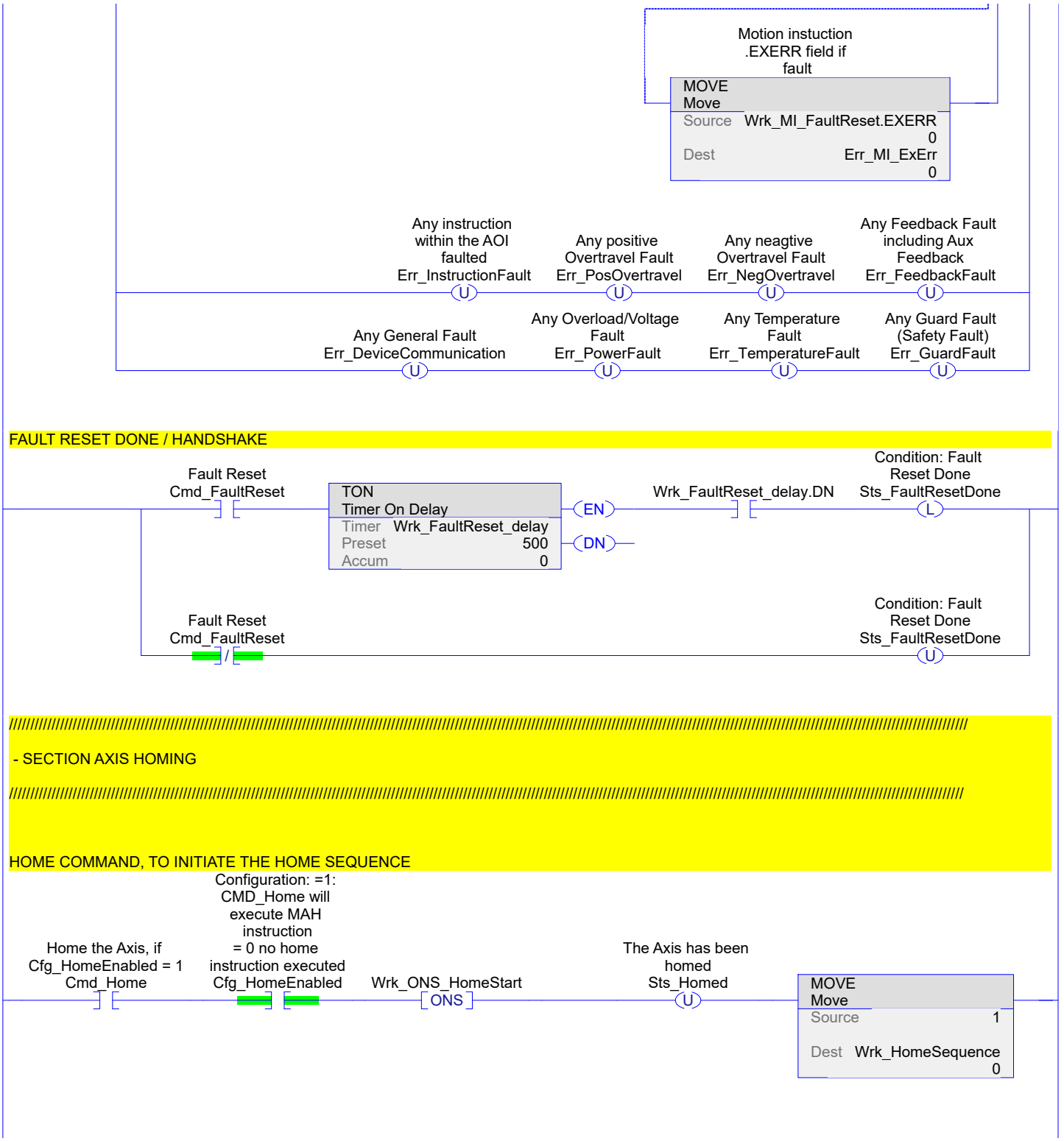
***** Changed occurances of Ref_Axis_CD.PowerStructureEnabledStatus to Ref_Axis_CD.DriveEnableStatus




MSO
Motion Servo On
Axis Ref_Axis_CD
Motion Control Wrk_MI_Enable
EN
DN
ER
Motion instruction .ERR field if fault
Motion instuction .EXERR field if fault
MOVE
Move
Source 1
0
Dest Sts_Err
0
MOVE
Move
Source Wrk_MI_Enable.ERR
0
Dest Err_MI_Err
0
MOVE
Move
Source Wrk_MI_Enable.EXERR
0
Dest Err_MI_ExErr
0
Condition: Enable Done
Sts_EnableDone
MOVE
Move
Source 2
Dest Sts_Err
0




//
- SECTION AXIS FAULT RESET
//
- RESET FAULTs
***** Corrected to zero Sts_Err and Sts_ExtErr only on transition of Cmd_FaultReset
4
Fault Reset
Cmd_FaultReset
Wrk_ONS_Init
ONS
MOVE
Move
Source 0
Dest Sts_Err
0
Motion instruction
.ERR field if fault
MOVE
Move
Source 0
Dest Err_MI_Err
0
Motion instuction
.EXERR field if
fault
MOVE
Move
Source 0
Dest Err_MI_ExErr
0
MASR
Motion Axis Shutdown Reset
Axis Ref_Axis_CD ...
Motion Control Wrk_MI_ShutdownReset
EN
DN
ER
Wrk_MI_ShutdownReset.ER
MOVE
Move
Source 5
Dest Sts_Err
0
Motion instruction
.ERR field if fault
MOVE
Move
Source Wrk_MI_ShutdownReset.ERR
0
Dest Err_MI_Err
0
Motion instuction
.EXERR field if
fault
MOVE
Move
Source Wrk_MI_ShutdownReset.EXERR
0
Dest Err_MI_ExErr
0
MAFR
Motion Axis Fault Reset
Axis Ref_Axis_CD ...
Motion Control Wrk_MI_FaultReset
EN
DN
ER
Wrk_MI_FaultReset.ER
MOVE
Move
Source 6
Dest Sts_Err
0
Motion instruction
.ERR field if fault
MOVE
Move
Source Wrk_MI_FaultReset.ERR
0
Dest Err_MI_Err
0



HOME SEQUENCE EXECUTION (CONFIGURATION VIA AXIS PROPERTIES WIZARDS)

7

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 ...
trol Wrk_MI_Home

EN
DN
ER
IP
PC

Motion instuction
.EXERR field if
fault

OVE
ove
ource Wrk_MI_Home.EXERR
0
est Err_MI_ExErr
0

MOVE
Move
Source 2
Dest Wrk_HomeSequence
0

AXIS IS HOMED

8

EQ
Equal
Source A Wrk_HomeSequence
0
Source B 2

Wrk_MI_Home.PC

The Axis has been
homed
Sts_Homed
L

MOVE
Move
Source 3
Dest Wrk_HomeSequence
0

HOME DONE HANDSHAKE

9

Home the Axis, if Cfg_HomeEnabled = 1
Cmd_Home

Configuration: =1: CMD_Home will execute MAH instruction = 0 no home instruction executed
Cfg_HomeEnabled

The Axis has been homed
Sts_Homed

Condition: Home Done
Sts_HomeDone

//

- SECTION AXIS STOP

//

WHENEVER THE MACHINE ENTERS EITHER STOPPING OR ABORTING, STOP THE AXIS
- If stopping, all axes are stopped AFTER the imaginary stops. This provides a coordinated stop
- Aborting cause all axes independently to stop.

10

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

MOVE
Move
Source Cfg_AbortRamp
100.0
Dest Wrk_DecelRate
0.0

If Cfg_UseVirtualMaster =1: Abort, Stop will wait for Inp_MasterNoMotion before executing MAS instruction
Inp_MasterNoMotion

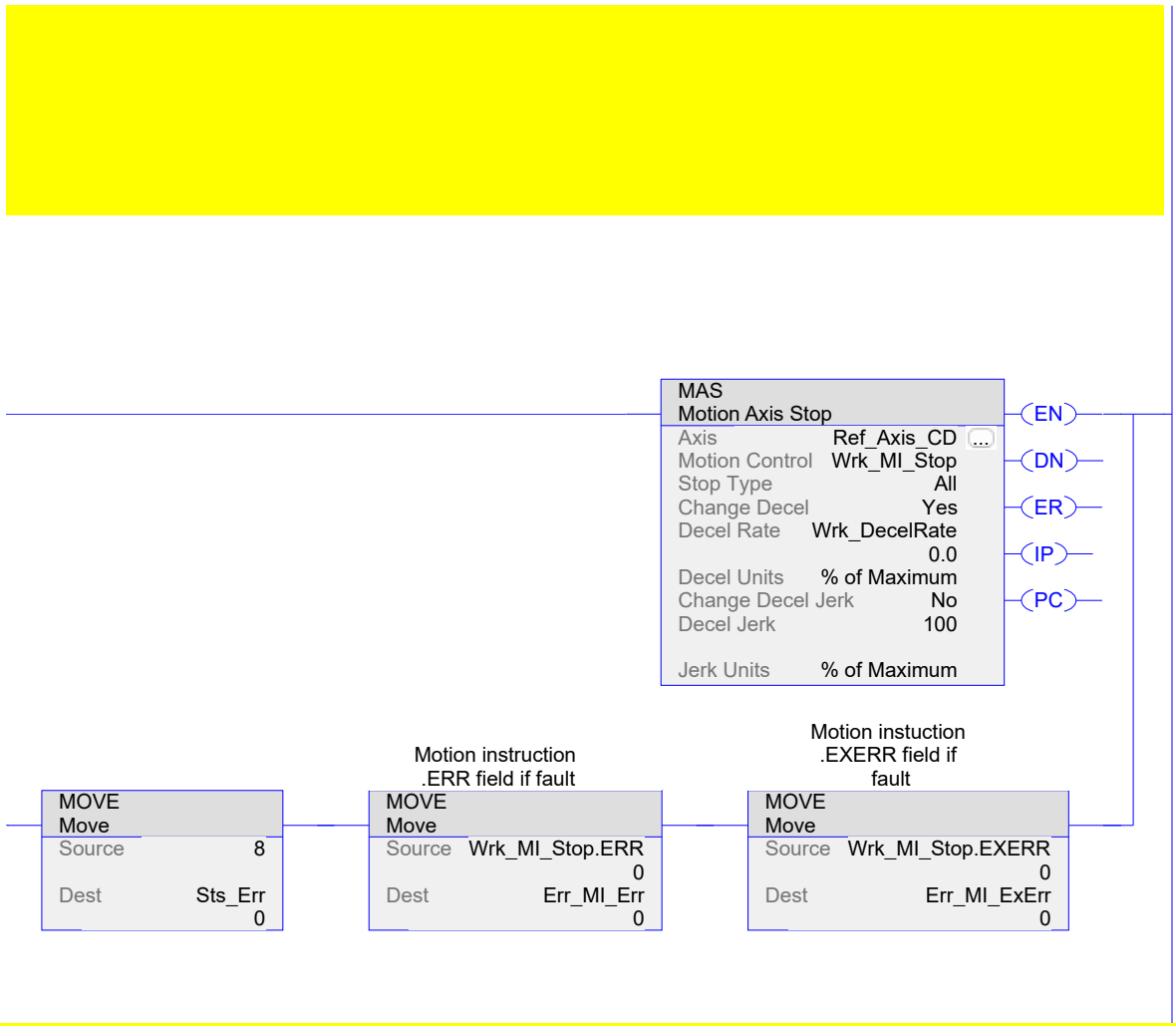
Configuration: =1: Abort, Stop will wait for Inp_MasterNoMotion before executing MAS instruction
Cfg_UseVirtualMaster
/

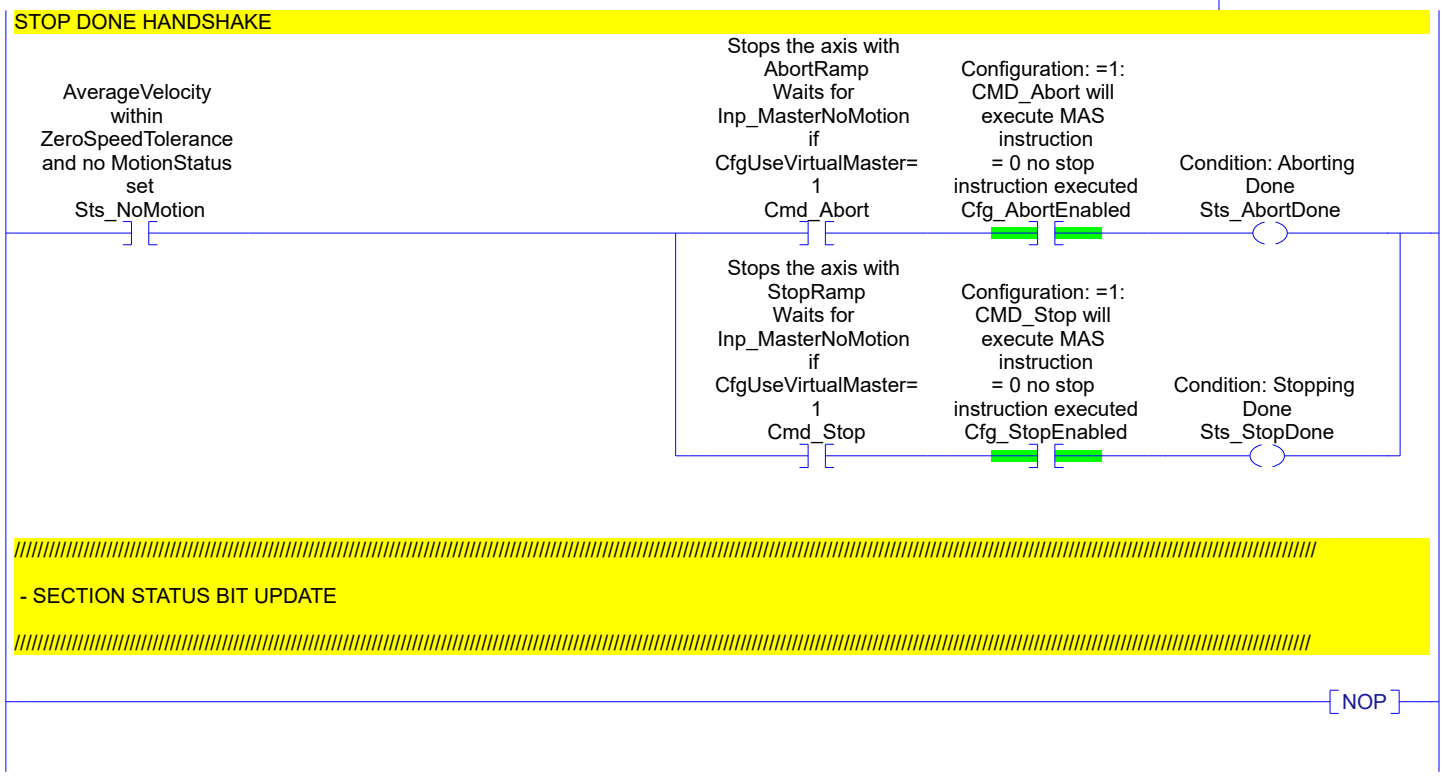
Stops the axis with StopRamp Waits for Inp_MasterNoMotion if CfgUseVirtualMaster= 1
Cmd_Stop

Configuration: =1: CMD_Stop will execute MAS instruction = 0 no stop instruction executed
Cfg_StopEnabled

MOVE
Move
Source Cfg_StopRamp
20.0
Dest Wrk_DecelRate
0.0

Wrk_MI_Stop.ER


MAS
Motion Axis Stop
Axis Ref_Axis_CD
Motion Control Wrk_MI_Stop
Stop Type All
Change Decel Yes
Decel Rate Wrk_DecelRate
0.0
Decel Units % of Maximum
Change Decel Jerk No
Decel Jerk 100
Jerk Units % of Maximum
EN
DN
ER
IP
PC
MOVE
Move
Source 8
Dest Sts_Err
0
Motion instruction
.ERR field if fault
MOVE
Move
Source Wrk_MI_Stop.ERR
0
Dest Err_MI_Err
0
Motion instuction
.EXERR field if
fault
MOVE
Move
Source Wrk_MI_Stop.EXERR
0
Dest Err_MI_ExErr
0


STOP DONE HANDSHAKE
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
11
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

ABS
Absolute Value
Source Ref_Axis_CD.AverageVelocity
??
Dest Wrk_Velocity
0.0

LE
Less Than or Eql (A<=B)
Source A Wrk_Velocity
0.0
Source B Cfg_ZeroSpeedTolerance
0.1

Servo Axis, Data type Axis CIP Drive

MEQ
Mask Equal
Source Ref_Axis_CD.MotionStatus
??
Mask 65407
Compare 0

AverageVelocity within ZeroSpeedTolerance and no MotionStatus set Sts_NoMotion

- ABSOLUTE REFERNCE STATUS INFORMATION

14

Servo Axis, Data type Axis CIP Drive Ref_Axis_CD.APRFault

Absolute Feedback device shows Reference Ok Sts_AbsoluteReferenceStatus

15

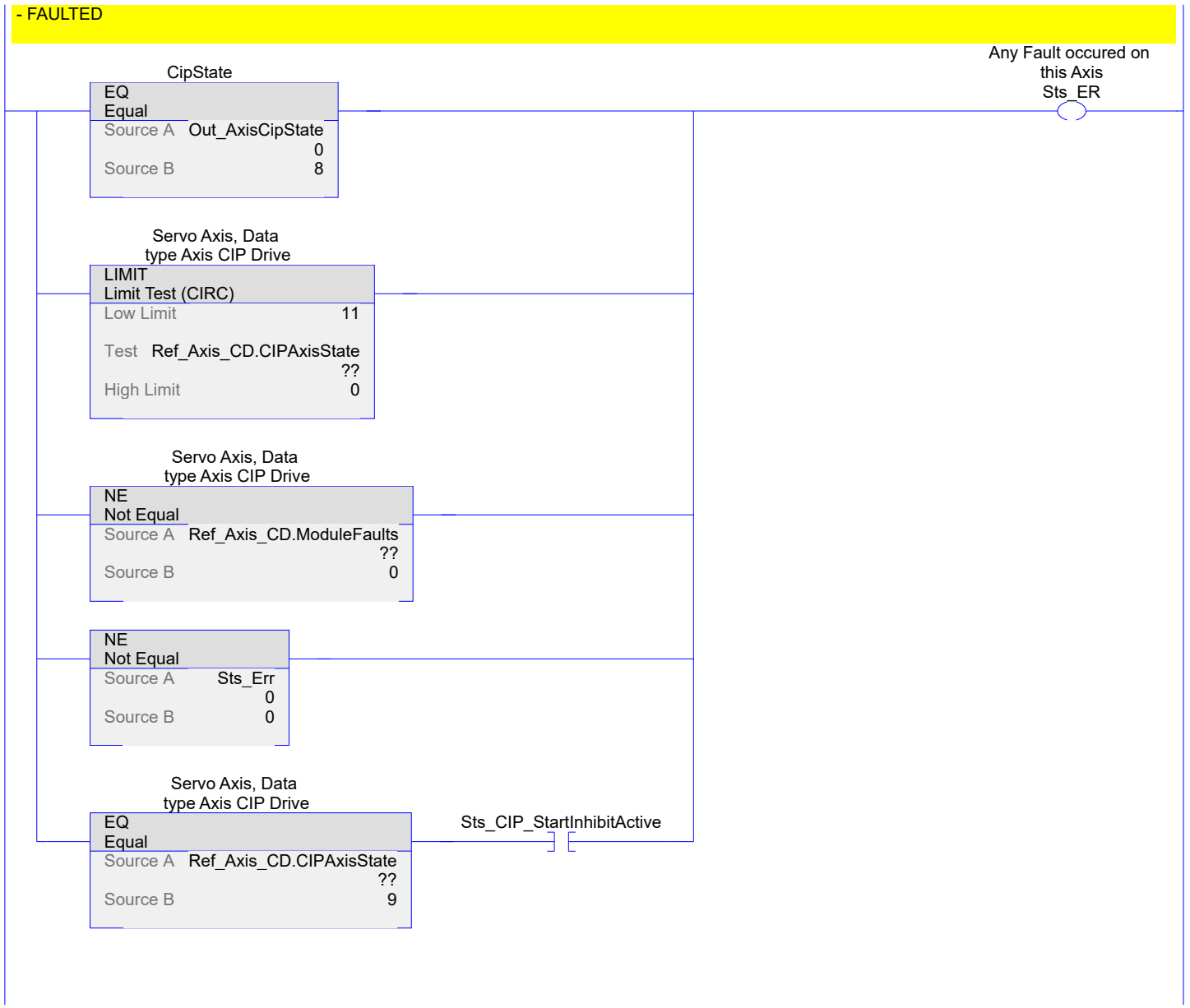
Servo Axis, Data type Axis CIP Drive

NE
Not Equal
Source A Ref_Axis_CD.CIPStartInhibits
??
Source B 0

Servo Axis, Data type Axis CIP Drive

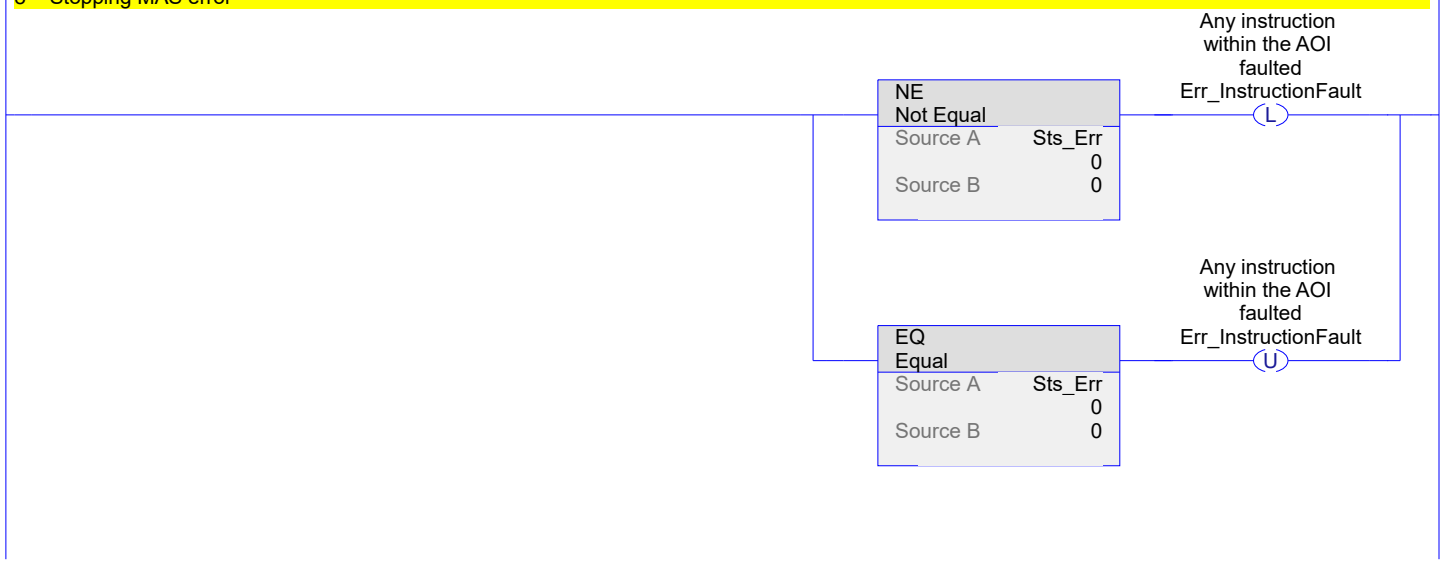
NE
Not Equal
Source A Ref_Axis_CD.CIPStartInhibitsRA
??
Source B 0

Sts_CIP_StartInhibitActive


- FAULTED
16
CipState
EQ
Equal
Source A Out_AxisCipState
0
Source B 8
Any Fault occured on this Axis
Sts_ER
Servo Axis, Data type Axis CIP Drive
LIMIT
Limit Test (CIRC)
Low Limit 11
Test Ref_Axis_CD.CIPAxisState
??
High Limit 0
Servo Axis, Data type Axis CIP Drive
NE
Not Equal
Source A Ref_Axis_CD.ModuleFaults
??
Source B 0
NE
Not Equal
Source A Sts_Err
0
Source B 0
Servo Axis, Data type Axis CIP Drive
EQ
Equal
Source A Ref_Axis_CD.CIPAxisState
??
Source B 9
Sts_CIP_StartInhibitActive

- 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

17



AXIS ERRORS

18

Any Fault occured on this Axis Sts_ER

Servo Axis, Data type Axis CIP Drive Ref_Axis_CD.SoftTravelLimitPositiveFault

Servo Axis, Data type Axis CIP Drive Ref_Axis_CD.HardwareOvertravelPositiveFault

Any positive Overtravel Fault Err_PosOvertravel (L)

Servo Axis, Data type Axis CIP Drive Ref_Axis_CD.SoftTravelLimitNegativeFault

Servo Axis, Data type Axis CIP Drive Ref_Axis_CD.HardwareOvertravelNegativeFault

Any neagtive Overtravel Fault Err_NegOvertravel (L)

Servo Axis, Data type Axis CIP Drive Ref_Axis_CD.FeedbackDeviceFault

Any Feedback Fault including Aux Feedback Err_FeedbackFault (L)

Servo Axis, Data type Axis CIP Drive

LIMIT
Limit Test (CIRC)
Low Limit 11
Test Ref_Axis_CD.CIPAxisState ??
High Limit 0

Any General Fault Err_DeviceCommunication (L)

Servo Axis, Data type Axis CIP Drive

NE
Not Equal
Source A Ref_Axis_CD.ModuleFaults ??
Source B 0

Any General Fault Err_DeviceCommunication (L)

Servo Axis, Data type Axis CIP Drive Ref_Axis_CD.ConverterPreChargeOverloadFLFault

Servo Axis, Data type Axis CIP Drive Ref_Axis_CD.MotorThermalOverloadFLFault

Servo Axis, Data type Axis CIP Drive Ref_Axis_CD.InverterThermalOverloadFLFault

Servo Axis, Data type Axis CIP Drive Ref_Axis_CD.ConverterThermalOverloadFLFault

Servo Axis, Data type Axis CIP Drive Ref_Axis_CD.BusRegulatorThermalOverloadFLFault

Servo Axis, Data type Axis CIP Drive Ref_Axis_CD.ModuleVoltageMismatchFault

Servo Axis, Data type Axis CIP Drive Ref_Axis_CD.MotorCommutationFault

Servo Axis, Data

Any Overload/Voltage Fault Err_PowerFault (L)

type Axis CIP Drive
Ref_Axis_CD.InverterOvercurrentFault

Servo Axis, Data
type Axis CIP Drive
Ref_Axis_CD.BusOvervoltageFLFault

Servo Axis, Data
type Axis CIP Drive
Ref_Axis_CD.BusUndervoltageFLFault

Servo Axis, Data
type Axis CIP Drive
Ref_Axis_CD.ConverterACSinglePhaseLossFault

Servo Axis, Data
type Axis CIP Drive
Ref_Axis_CD.MotorOvertemperatureFLFault

Any Temperature
Fault
Err_TemperatureFault
(L)

Servo Axis, Data
type Axis CIP Drive
Ref_Axis_CD.InverterOvertemperatureFLFault

Servo Axis, Data
type Axis CIP Drive
Ref_Axis_CD.ConverterOvertemperatureFLFault

Servo Axis, Data
type Axis CIP Drive
Ref_Axis_CD.BusRegulatorOvertemperatureFLFault

Servo Axis, Data
type Axis CIP Drive
Ref_Axis_CD.ExcessivePositionErrorFault

Position Error
window exceeded
Err_PositionError
(L)

Servo Axis, Data
type Axis CIP Drive
Ref_Axis_CD.GuardFault

Any Guard Fault
(Safety Fault)
Err_GuardFault
(L)

Servo Axis, Data
type Axis CIP Drive
Ref_Axis_CD.GuardGateDriveOutputStatus
/

Any Guard Fault
(Safety Fault)
Err_GuardFault
(L)

AXIS IS OK AND READY

19

Any Fault occured on
this Axis
Sts_ER
/

Motion Group
Inp_MotionGroup.GroupSynced

Servo Axis, Data
type Axis CIP Drive
Ref_Axis_CD.InitializationFault
/

Servo Axis, Data
type Axis CIP Drive
Ref_Axis_CD.ModuleFault
/

Servo Axis, Data
type Axis CIP Drive
Ref_Axis_CD.ShutdownStatus
/

Status Display:
Axis ready to enable
Sts_AxisOk

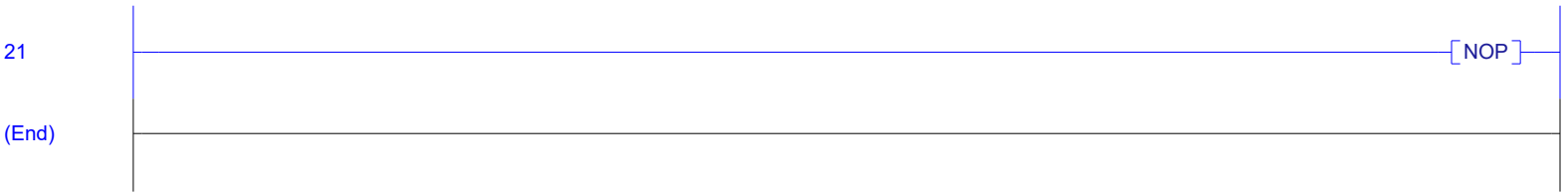
20

Any Fault occured on
this Axis
Sts_ER

Wrk_ER_ONS
ONS

HMI Display tag used
with HMI Global
Object

MOVE
Move
Source 0
Dest Cfg_HMIFPDisplay
0




```
////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
COMPANY:          Rockwell Automation
FUNCTION:         AXIS_CIP_DRIVE AOI
AUTHOR:           Rockwell Automation
DATE UPDATED:     Jun 2011

FUNCTION:

Version Comments:

////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
```

0

NOP

PRESCAN INIT - Motion Instruction

1

MOVE Move — Source 0 — Dest Wrk_MI_Init.FLAGS 0

MOVE Move — Source 0 — Dest Wrk_MI_Init.ERR 0

MOVE Move — Source 0 — Dest Wrk_MI_Init.STATUS 0

MOVE Move — Source 0 — Dest Wrk_MI_Init.STATE 0

MOVE Move — Source 0 — Dest Wrk_MI_Init.SEGMENT 0

MOVE Move — Source 0 — Dest Wrk_MI_Init.EXERR 0

COP Copy File — Source Wrk_MI_Init — Dest Wrk_MI_Disable — Length 1

COP Copy File — Source Wrk_MI_Init — Dest Wrk_MI_Enable — Length 1

COP Copy File — Source Wrk_MI_Init — Dest Wrk_MI_Home — Length 1

COP Copy File — Source Wrk_MI_Init — Dest Wrk_MI_Stop — Length 1

COP Copy File — Source Wrk_MI_Init — Dest Wrk_MI_FaultReset — Length 1

COP Copy File — Source Wrk_MI_Init — Dest Wrk_MI_ShutdownReset — Length 1

PRESCAN INIT - HomeSequence

2

MOVE Move — Source 0 — Dest Wrk_HomeSequence 0

Wrk_ONS_HomeStart (U)

The Axis has been homed Sts_Homed (U)

3

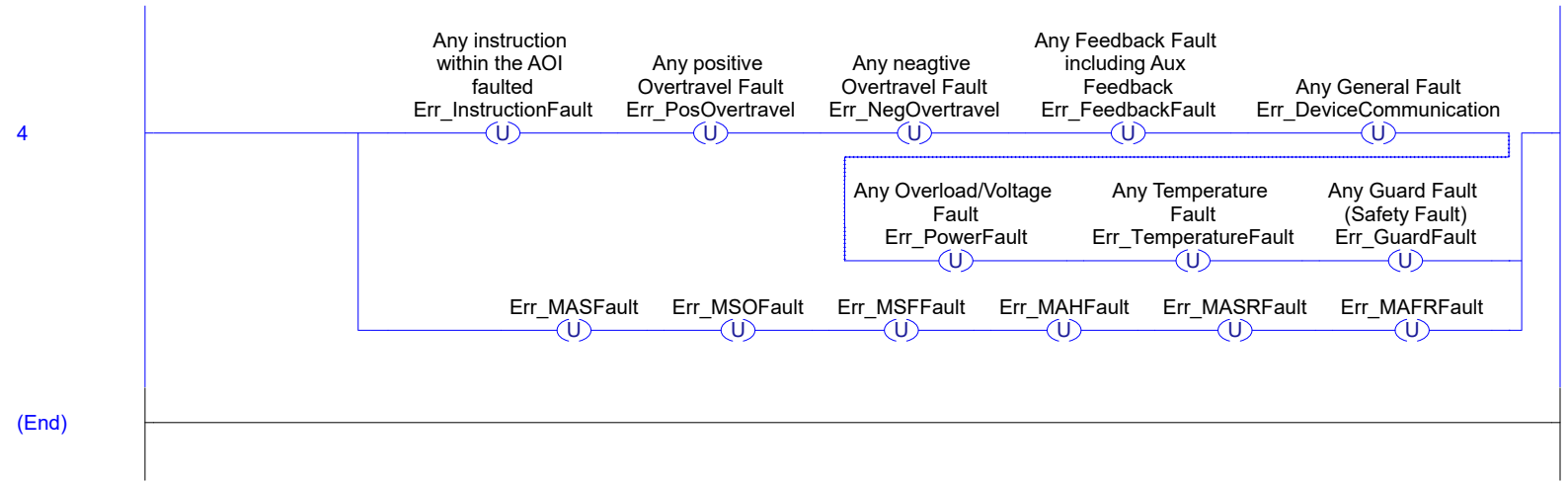
MOVE Move — Source 0 — Dest Sts_Err 0

Motion instruction .ERR field if fault

MOVE Move — Source 0 — Dest Err_MI_Err 0

Motion instuction .EXERR field if fault

MOVE Move — Source 0 — Dest Err_MI_ExErr 0

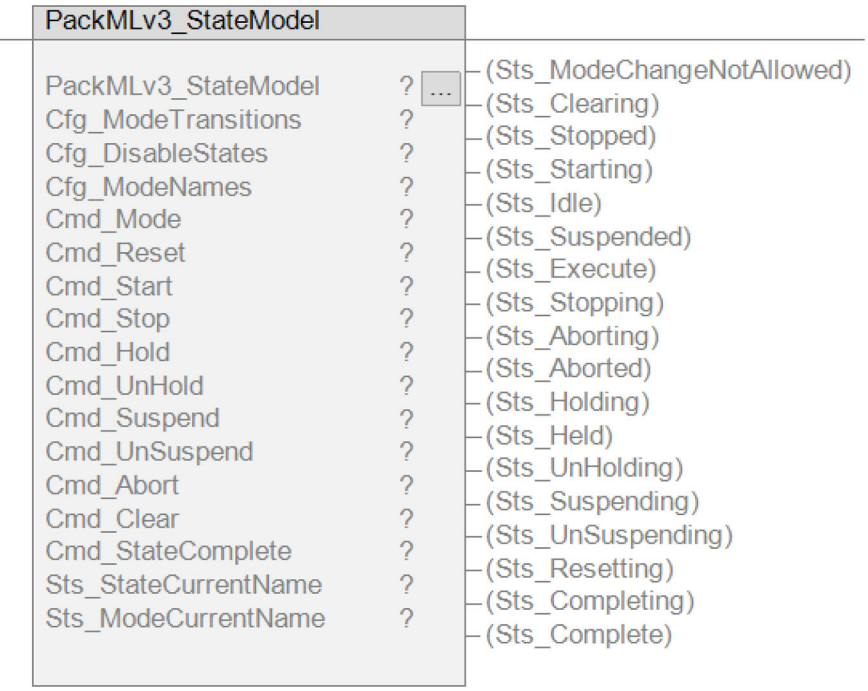

4
Any instruction within the AOI faulted
Err_InstructionFault
Any positive Overtravel Fault
Err_PosOvertravel
Any neagtive Overtravel Fault
Err_NegOvertravel
Any Feedback Fault including Aux Feedback
Err_FeedbackFault
Any General Fault
Err_DeviceCommunication
Any Overload/Voltage Fault
Err_PowerFault
Any Temperature Fault
Err_TemperatureFault
Any Guard Fault (Safety Fault)
Err_GuardFault
Err_MASFault
Err_MSOFault
Err_MSFFault
Err_MAHFault
Err_MASRFault
Err_MAFRFault
U
(End)

PackMLv3_StateModel v2.3
Rockwell Automation

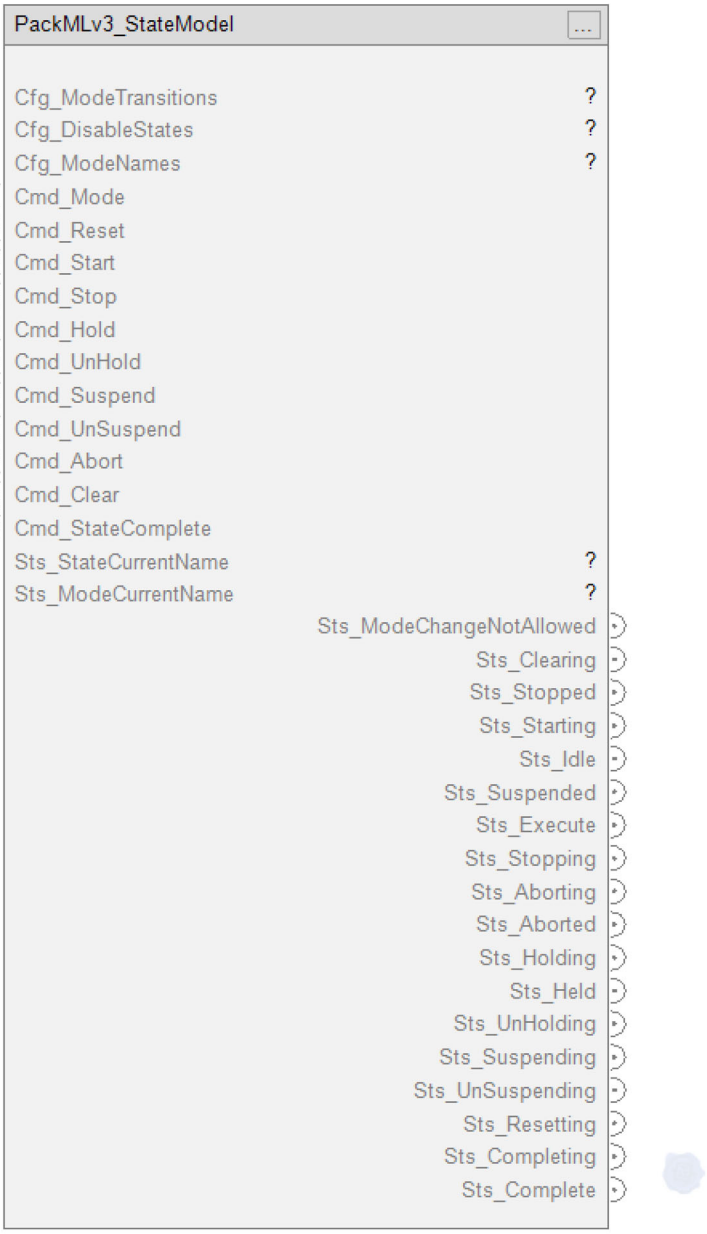
Class: Standard

Available Languages

Relay Ladder



Function Block



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

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

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

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

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

Cfg_ModeNames (Continued)
Mode Names

Cfg_ModeNames[28]	??	String_Short	
Mode Names			
Cfg_ModeNames[28].LEN	??	DINT	
Mode Names			
Cfg_ModeNames[28].DATA		SINT	
Mode Names			
Cfg_ModeNames[29]	??	String_Short	
Mode Names			
Cfg_ModeNames[29].LEN	??	DINT	
Mode Names			
Cfg_ModeNames[29].DATA		SINT	
Mode Names			
Cfg_ModeNames[30]	??	String_Short	
Mode Names			
Cfg_ModeNames[30].LEN	??	DINT	
Mode Names			
Cfg_ModeNames[30].DATA		SINT	
Mode Names			
Cfg_ModeNames[31]	??	String_Short	
Mode Names			
Cfg_ModeNames[31].LEN	??	DINT	
Mode Names			
Cfg_ModeNames[31].DATA		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)

Cfg_ModeTransitions[14]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[15]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[16]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[17]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[18]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[19]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[20]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[21]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[22]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[23]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[24]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[25]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[26]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[27]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[28]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[29]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[30]	??	DINT	
Acceptable States to Transition Between Modes			
Cfg_ModeTransitions[31]	??	DINT	
Acceptable States to Transition Between Modes			

Cfg_RemoteCmdEnable	0	BOOL	PackMLv3_StateModel
Enable Remote Commands			
Usage:	Input Parameter		
Required:	No		
Visible:	No		
External Access:	Read/Write		
OPC UA Access:	None		
Cfg_RemoteCmdEnable - PackMLv3_StateModel/Logic - 2(XIC)			

Cmd_Abort	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		
Cmd_Abort - PackMLv3_StateModel/Logic - 60(XIC)			

Cmd_Clear	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)

Cmd_Hold 0 BOOL PackMLv3_StateModel
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)

Cmd_Mode 0 DINT PackMLv3_StateModel
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)*

Cmd_Reset 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)

Cmd_Start 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)

Cmd_StateComplete 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)

Cmd_Stop 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)

Cmd_Suspend 0 BOOL PackMLv3_StateModel
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(OTE), 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(OTE), 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(OTE)*

Sts_EnabledStates.2 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.2 - PackMLv3_StateModel/Logic - *16(OTE)*

Sts_EnabledStates.3 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.3 - PackMLv3_StateModel/Logic - *17(OTE)*

Sts_EnabledStates.4 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.4 - PackMLv3_StateModel/Logic - *18(OTE)*

Sts_EnabledStates.5 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.5 - PackMLv3_StateModel/Logic - *20(OTE)*

Sts_EnabledStates.6 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.6 - PackMLv3_StateModel/Logic - *21(OTE)*

Sts_EnabledStates.7 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.7 - PackMLv3_StateModel/Logic - *22(OTE)*

Sts_EnabledStates.8 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.8 - PackMLv3_StateModel/Logic - *23(OTE)*

Sts_EnabledStates.9 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.9 - PackMLv3_StateModel/Logic - *24(OTE)*

Sts_EnabledStates.10 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.10 - PackMLv3_StateModel/Logic - *26(OTE)*

Sts_EnabledStates.11 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.11 - PackMLv3_StateModel/Logic - *27(OTE)*

Sts_EnabledStates.12 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.12 - PackMLv3_StateModel/Logic - *28(OTE)*

Sts_EnabledStates.13 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.13 - PackMLv3_StateModel/Logic - *29(OTE)*

Sts_EnabledStates (Continued)
Sts_EnabledStates.14 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.14 - PackMLv3_StateModel/Logic - *30(OTE)*
Sts_EnabledStates.15 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.15 - PackMLv3_StateModel/Logic - *31(OTE)*
Sts_EnabledStates.16 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.16 - PackMLv3_StateModel/Logic - *33(OTE)*
Sts_EnabledStates.17 0 BOOL
Currently Disabled States = 0
*Sts_EnabledStates.17 - PackMLv3_StateModel/Logic - *34(OTE)*

Sts_Execute 0 BOOL PackMLv3_StateModel
The Execute state is active.
Usage: Output Parameter
Required: No
Visible: Yes
External Access: Read Only
OPC UA Access: None
*Sts_Execute - PackMLv3_StateModel/Logic - *67(OTE), 67(XIO)*

Sts_ExecuteEnabled 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
*Sts_ExecuteEnabled - PackMLv3_StateModel/Logic - *21(OTE)*

Sts_Held 0 BOOL PackMLv3_StateModel
The Held state is active.
Usage: Output Parameter
Required: No
Visible: Yes
External Access: Read Only
OPC UA Access: None
*Sts_Held - PackMLv3_StateModel/Logic - *72(OTE), 72(XIO)*

Sts_HeldEnabled 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
*Sts_HeldEnabled - PackMLv3_StateModel/Logic - *27(OTE), 54(XIC)*

Sts_Holding 0 BOOL PackMLv3_StateModel
The Holding state is active.
Usage: Output Parameter
Required: No
Visible: Yes
External Access: Read Only
OPC UA Access: None
*Sts_Holding - PackMLv3_StateModel/Logic - *71(OTE), 71(XIO)*

Sts_HoldingEnabled 0 BOOL PackMLv3_StateModel
Use of the Holding state for the current mode is enabled
Usage: Output Parameter
Required: No

Sts_HoldingEnabled (Continued)
Visible: No
External Access: Read Only
OPC UA Access: None
*Sts_HoldingEnabled - PackMLv3_StateModel/Logic - *26(OTE), 44(XIO)*

Sts_Idle 0 BOOL PackMLv3_StateModel
The Idle state is active.
Usage: Output Parameter
Required: No
Visible: Yes
External Access: Read Only
OPC UA Access: None
*Sts_Idle - PackMLv3_StateModel/Logic - *65(OTE), 65(XIO)*

Sts_IdleEnabled 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
*Sts_IdleEnabled - PackMLv3_StateModel/Logic - *18(OTE), 53(XIO)*

Sts_ModeChangeNotAllowed 0 BOOL PackMLv3_StateModel
Mode Change Request Was Denied
Usage: Output Parameter
Required: No
Visible: Yes
External Access: Read Only
OPC UA Access: None
*Sts_ModeChangeNotAllowed - PackMLv3_StateModel/Logic - *85(OTE)*

Sts_ModeCurrent 0 DINT PackMLv3_StateModel
Current Mode ID
Usage: Output Parameter
Required: No
Visible: No
External Access: Read Only
OPC UA Access: None
*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)*
*Sts_ModeCurrent - PackMLv3_StateModel/Prescan - *0(MOVE)*

Sts_ModeCurrentName ?? String_Short PackMLv3_StateModel
Current Mode Name
Usage: InOut Parameter
Required: Yes
Visible: Yes
Constant No
OPC UA Access: None
*Sts_ModeCurrentName - PackMLv3_StateModel/Logic - *86(COP)*
Sts_ModeCurrentName.LEN ?? DINT
Current Mode Name
Sts_ModeCurrentName.DATA SINT
Current Mode Name

Sts_Resetting 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(OTE), 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(OTE), 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(OTE), 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(OTE), 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(OTE), 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(OTE)*

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(OTE), 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(OTE), 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(OTE), 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(OTE), 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(OTE), 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(OTE), 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(OTE), 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(OTE), 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(OTE), 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(OTE), 47(XIO)*

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

StringClearing 'Clearing' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringClearing - PackMLv3_StateModel/Logic - 62(COP)

StringComplete 'Complete' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringComplete - PackMLv3_StateModel/Logic - 78(COP)

StringCompleting 'Completing' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringCompleting - PackMLv3_StateModel/Logic - 77(COP)

StringExecute 'Execute' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringExecute - PackMLv3_StateModel/Logic - 67(COP)

StringHeld 'Held' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringHeld - PackMLv3_StateModel/Logic - 72(COP)

StringHolding 'Holding' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringHolding - PackMLv3_StateModel/Logic - 71(COP)

StringIdle 'Idle' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringIdle - PackMLv3_StateModel/Logic - 65(COP)

StringResetting 'Resetting' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringResetting - PackMLv3_StateModel/Logic - 76(COP)

StringStarting 'Starting' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringStarting - PackMLv3_StateModel/Logic - 64(COP)

StringStopped 'Stopped' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringStopped - PackMLv3_StateModel/Logic - 63(COP)

StringStopping 'Stopping' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write

StringStopping (Continued)
OPC UA Access: None
StringStopping - PackMLv3_StateModel/Logic - 68(COP)

StringSuspended 'Suspended' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringSuspended - PackMLv3_StateModel/Logic - 66(COP)

StringSuspending 'Suspending' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringSuspending - PackMLv3_StateModel/Logic - 74(COP)

StringUnHolding 'UnHolding' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringUnHolding - PackMLv3_StateModel/Logic - 73(COP)

StringUnSuspending 'UnSuspending' String_Short PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
StringUnSuspending - PackMLv3_StateModel/Logic - 75(COP)

SuspendRemoteCmd 0 BOOL PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
*SuspendRemoteCmd - PackMLv3_StateModel/Logic - *8(OTE), 56(XIC)*

TON_ModeChangeNotAllowed TIMER PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
*TON_ModeChangeNotAllowed - PackMLv3_StateModel/Logic - *85(TON)*
TON_ModeChangeNotAllowed.PRE
3000 DINT
*TON_ModeChangeNotAllowed.PRE - PackMLv3_StateModel/Prescan - *2(MOVE)*
TON_ModeChangeNotAllowed.DN 0 BOOL
TON_ModeChangeNotAllowed.DN - PackMLv3_StateModel/Logic - 85(XIC)

UnHoldRemoteCmd 0 BOOL PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
*UnHoldRemoteCmd - PackMLv3_StateModel/Logic - *7(OTE), 55(XIC)*

UnSuspendRemoteCmd 0 BOOL PackMLv3_StateModel
Usage: Local Tag
External Access: Read/Write
OPC UA Access: None
*UnSuspendRemoteCmd - PackMLv3_StateModel/Logic - *9(OTE), 57(XIC)*

PackML Logic
The following logic will manage PackML modes, states, and times.

0 NOP

Remote Command Processing Logic
Note: Cfg_EnableInternalRemoteCmdProcessing is used enable internal logic.

1 NOP

2 State Remote Command Change Request Inp_RemoteStateCmdChangeRequest | Enable Remote Commands Cfg_RemoteCmdEnable | RemoteCmdChangeRequested

3 RemoteCmdChangeRequested | State Remote Command Interface: EQ Equal, Source A Inp_RemoteStateCmd 0, Source B 1 | ResetRemoteCmd

4 RemoteCmdChangeRequested | State Remote Command Interface: EQ Equal, Source A Inp_RemoteStateCmd 0, Source B 2 | StartRemoteCmd

5 RemoteCmdChangeRequested | State Remote Command Interface: EQ Equal, Source A Inp_RemoteStateCmd 0, Source B 3 | StopRemoteCmd

6 RemoteCmdChangeRequested | State Remote Command Interface: EQ Equal, Source A Inp_RemoteStateCmd 0, Source B 4 | HoldRemoteCmd

7 RemoteCmdChangeRequested | State Remote Command Interface: EQ Equal, Source A Inp_RemoteStateCmd 0, Source B 5 | UnHoldRemoteCmd

8

RemoteCmdChangeRequested

State Remote Command Interface
EQ Equal
Source A Inp_RemoteStateCmd 0
Source B 6

SuspendRemoteCmd

9

RemoteCmdChangeRequested

State Remote Command Interface
EQ Equal
Source A Inp_RemoteStateCmd 0
Source B 7

UnSuspendRemoteCmd

10

RemoteCmdChangeRequested

State Remote Command Interface
EQ Equal
Source A Inp_RemoteStateCmd 0
Source B 8

AbortRemoteCmd

11

RemoteCmdChangeRequested

State Remote Command Interface
EQ Equal
Source A Inp_RemoteStateCmd 0
Source B 9

ClearRemoteCmd

State Disable Logic

Ensure Stopped, Execute, and Aborted States are not disabled.

12

NOP

13

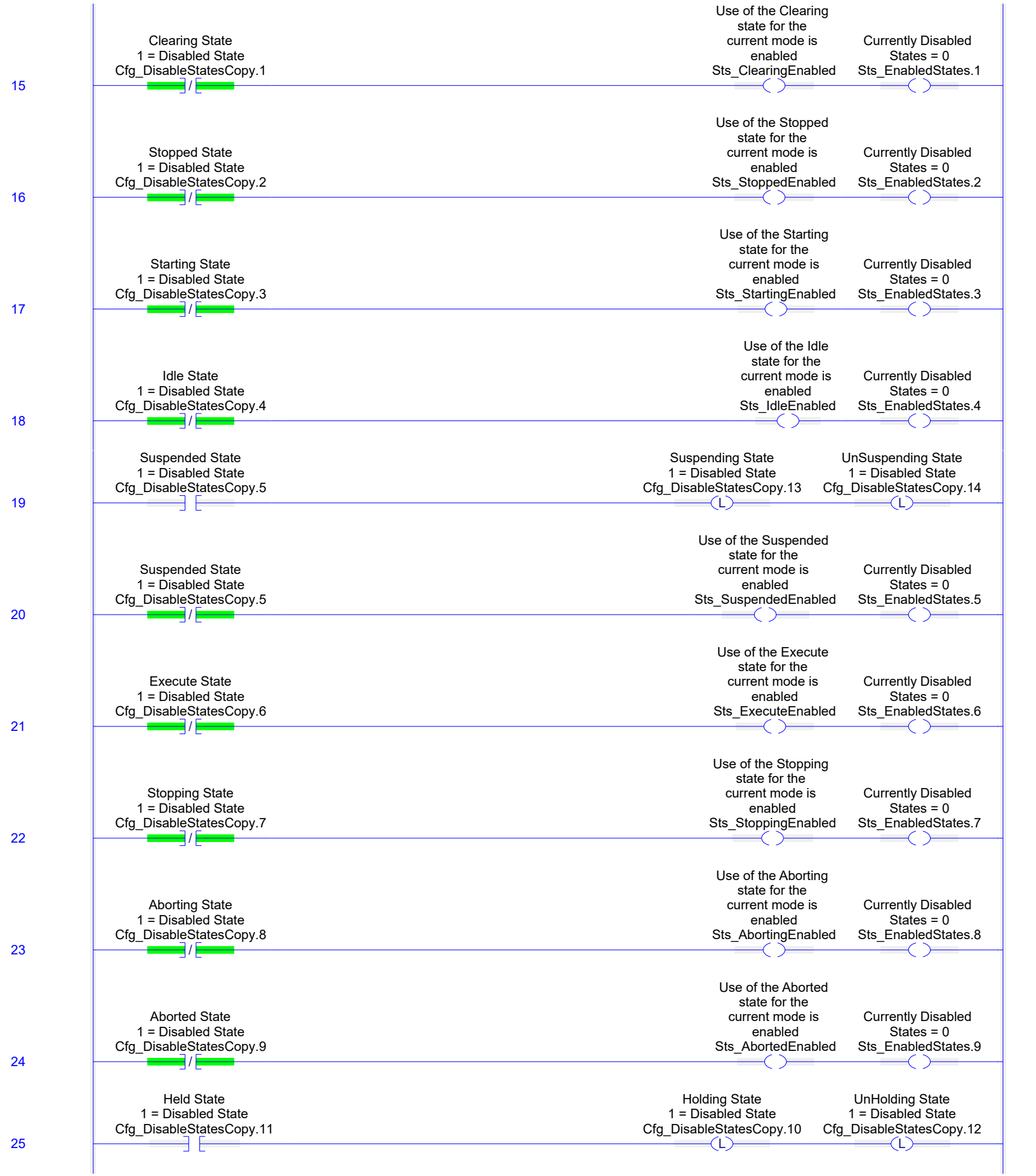
MOVE Move
Source Cfg_DisableStates[Sts_ModeCurrent] ??
Dest Cfg_DisableStatesCopy 0

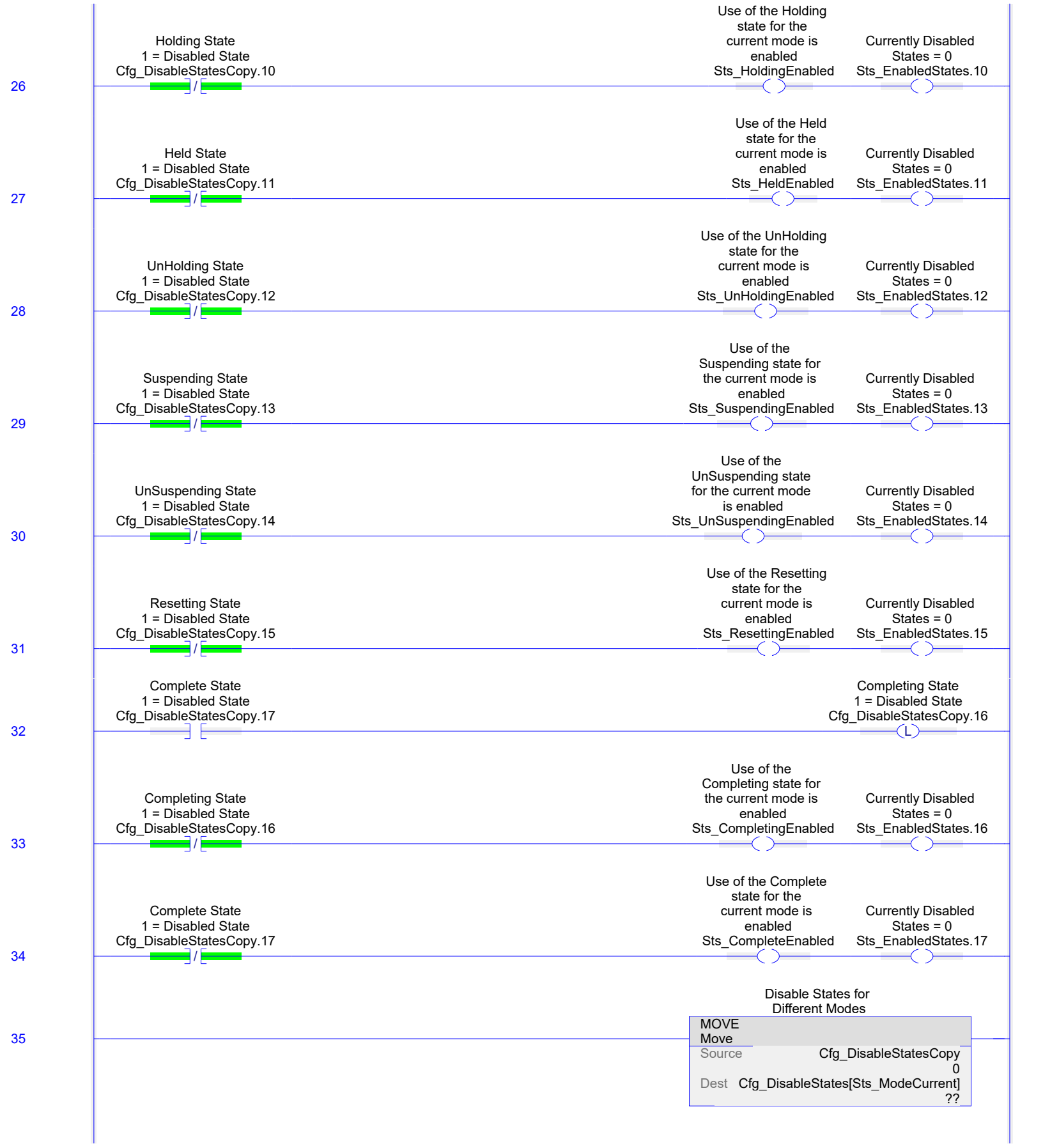
14

Stopped State 1 = Disabled State Cfg_DisableStatesCopy.2
Stopped State 1 = Disabled State Cfg_DisableStatesCopy.2 (U)

Execute State 1 = Disabled State Cfg_DisableStatesCopy.6
Execute State 1 = Disabled State Cfg_DisableStatesCopy.6 (U)

Aborted State 1 = Disabled State Cfg_DisableStatesCopy.9
Aborted State 1 = Disabled State Cfg_DisableStatesCopy.9 (U)





State Complete Bits

36 NOP

37 PackML State Complete Command - Latch Cmd_StateComplete to allow transition from acting state to wait state Cmd_StateComplete — StateComplete (L)

38 PackML State Complete Command - Latch Cmd_StateComplete to allow transition from acting state to wait state Cmd_StateComplete — StateComplete (U)

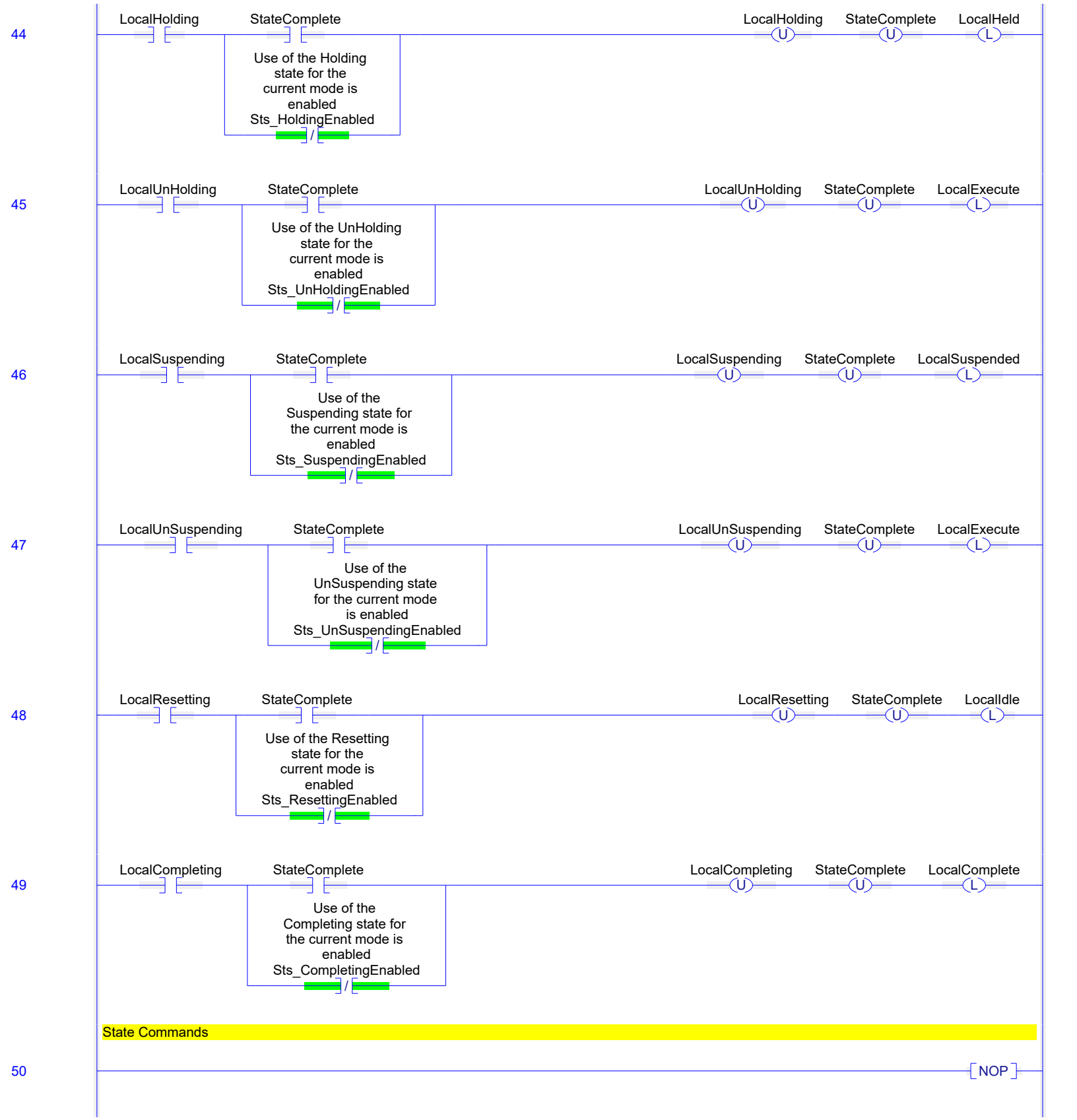
39 LocalClearing, StateComplete, Use of the Clearing state for the current mode is enabled Sts_ClearingEnabled — LocalClearing (U), StateComplete (U), LocalStopped (L)

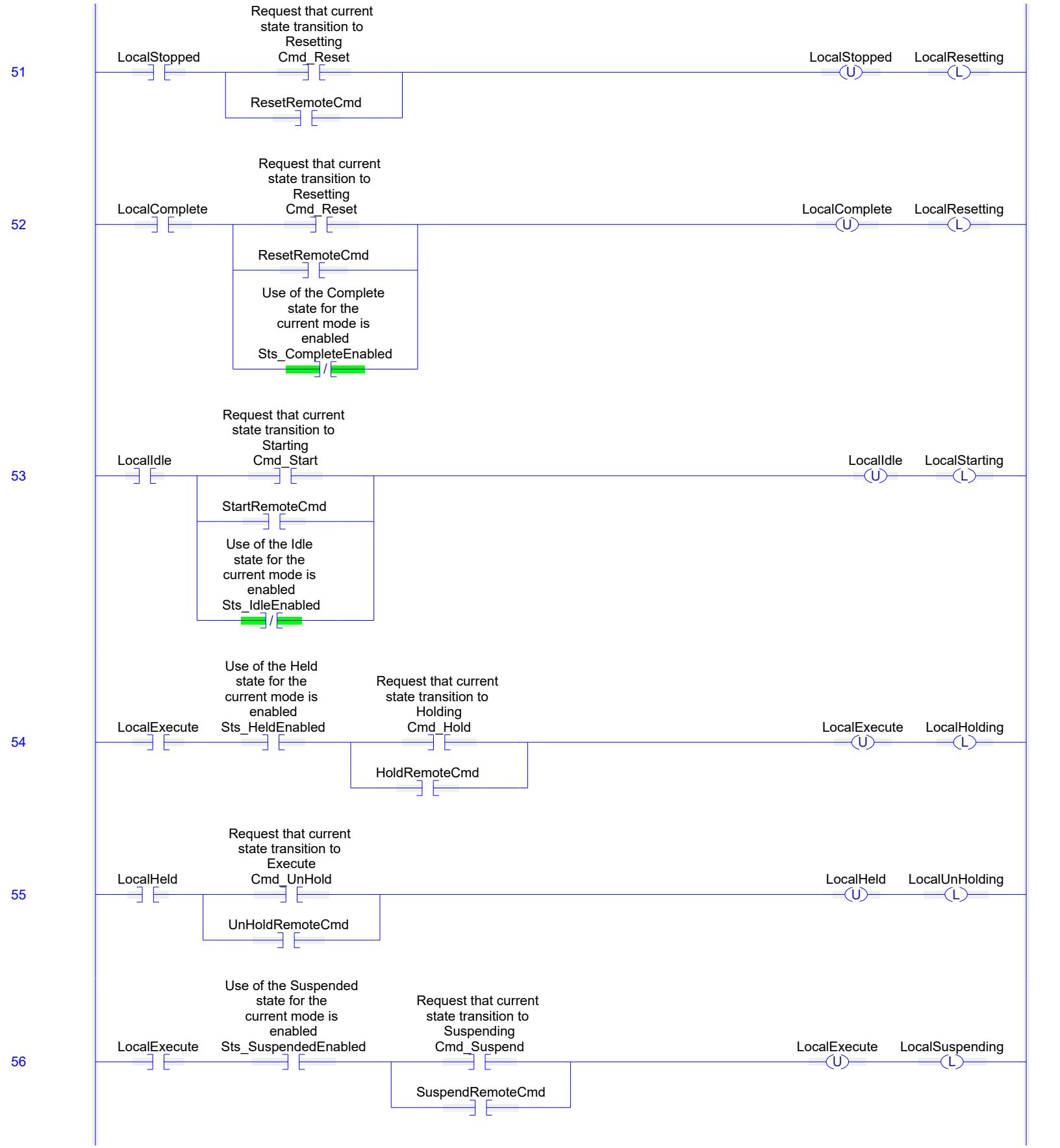
40 LocalStarting, StateComplete, Use of the Starting state for the current mode is enabled Sts_StartingEnabled — LocalStarting (U), StateComplete (U), LocalExecute (L)

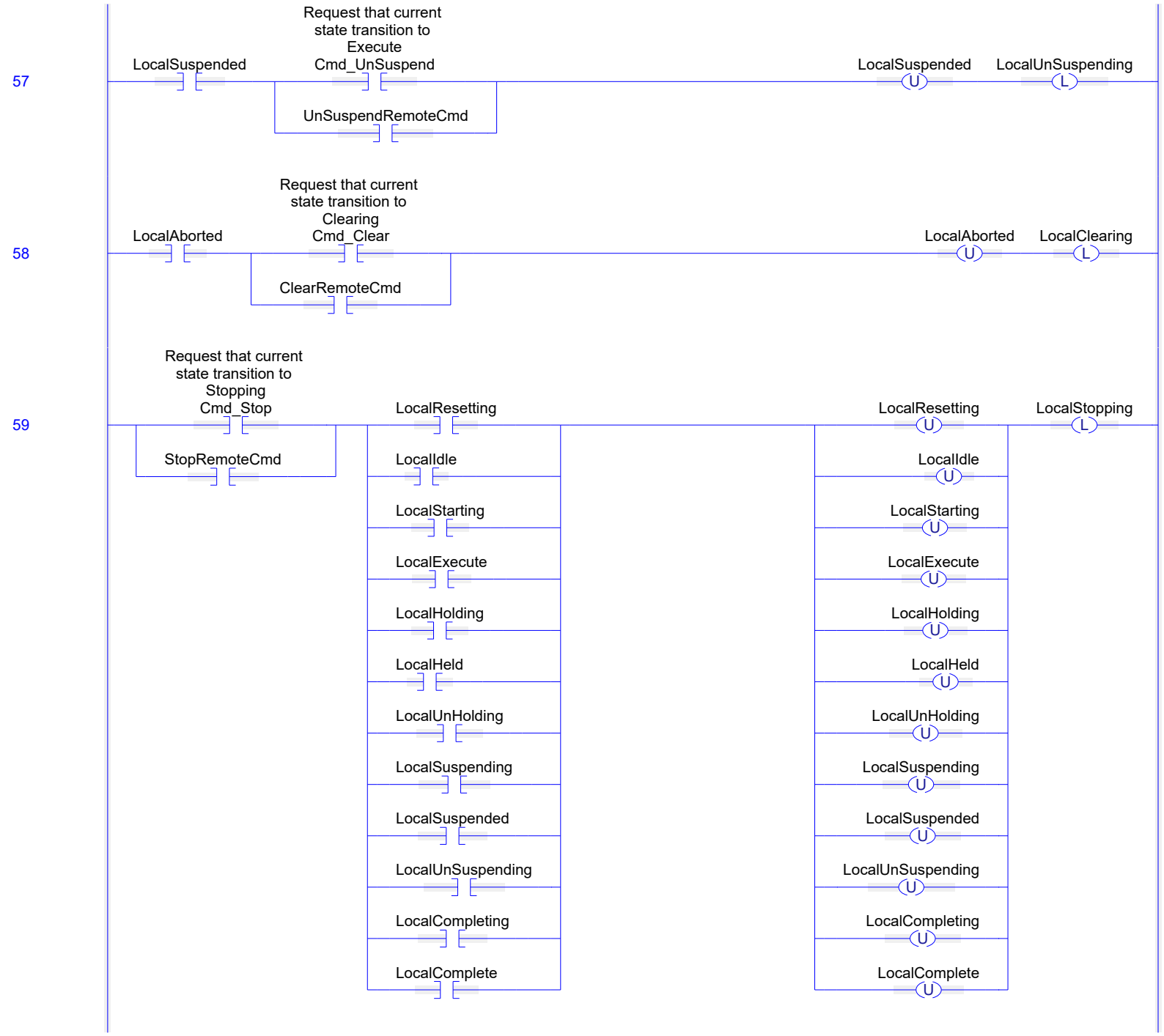
41 LocalExecute, Use of the Complete state for the current mode is enabled Sts_CompleteEnabled, StateComplete — LocalExecute (U), StateComplete (U), LocalCompleting (L)

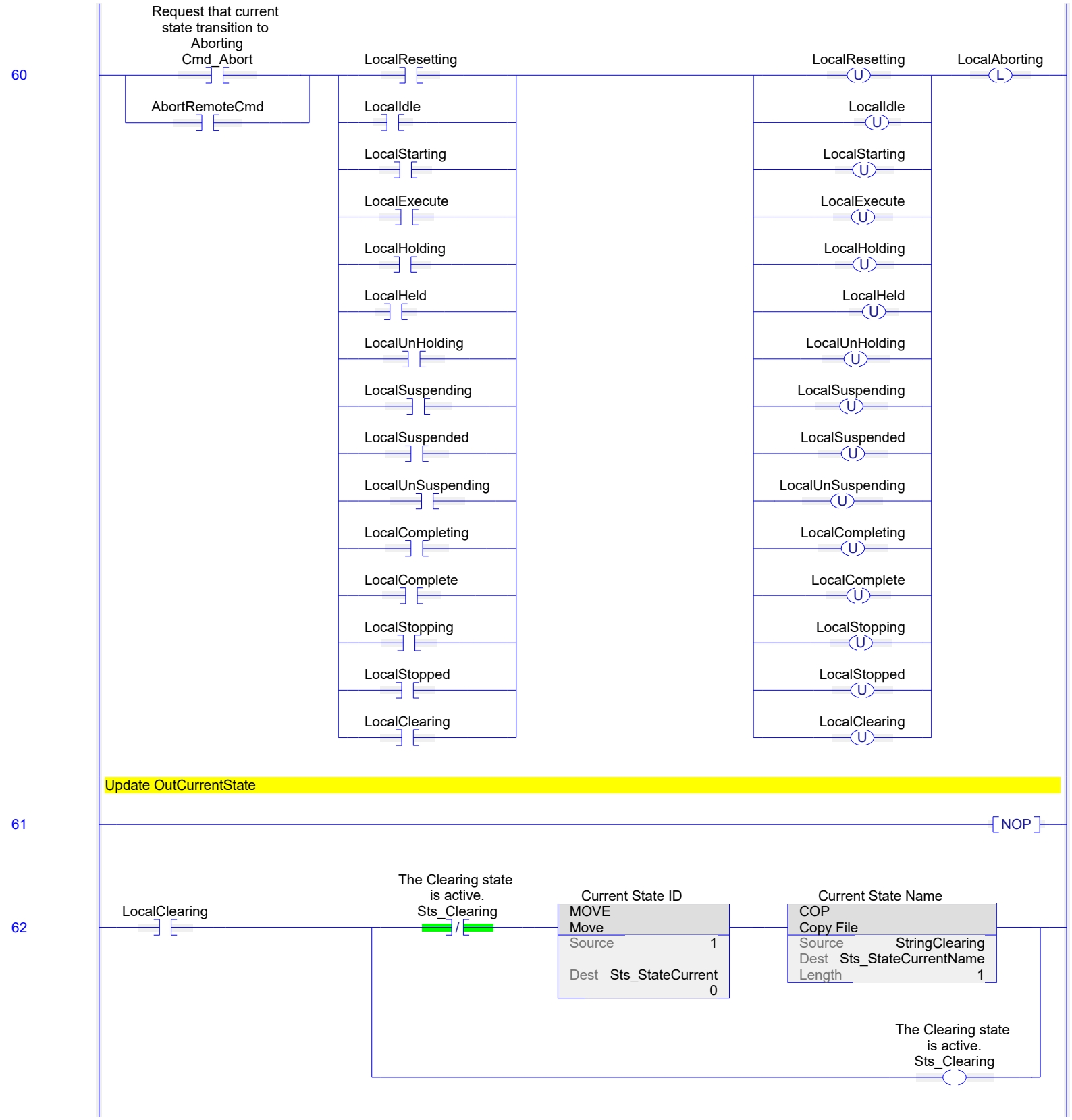
42 LocalStopping, StateComplete, Use of the Stopping state for the current mode is enabled Sts_StoppingEnabled — LocalStopping (U), StateComplete (U), LocalStopped (L)

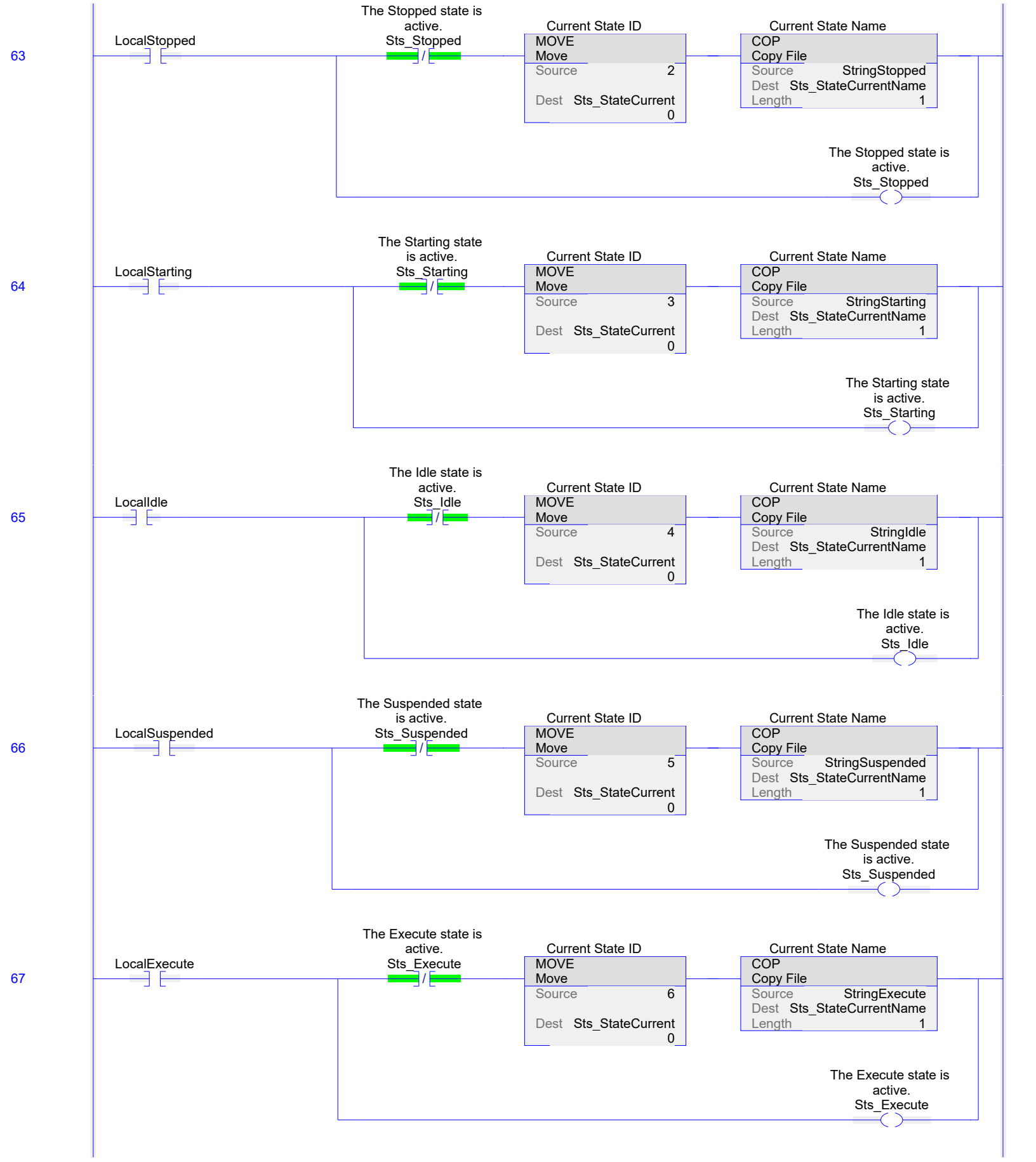
43 LocalAborting, StateComplete, Use of the Aborting state for the current mode is enabled Sts_AbortingEnabled — LocalAborting (U), StateComplete (U), LocalAborted (L)

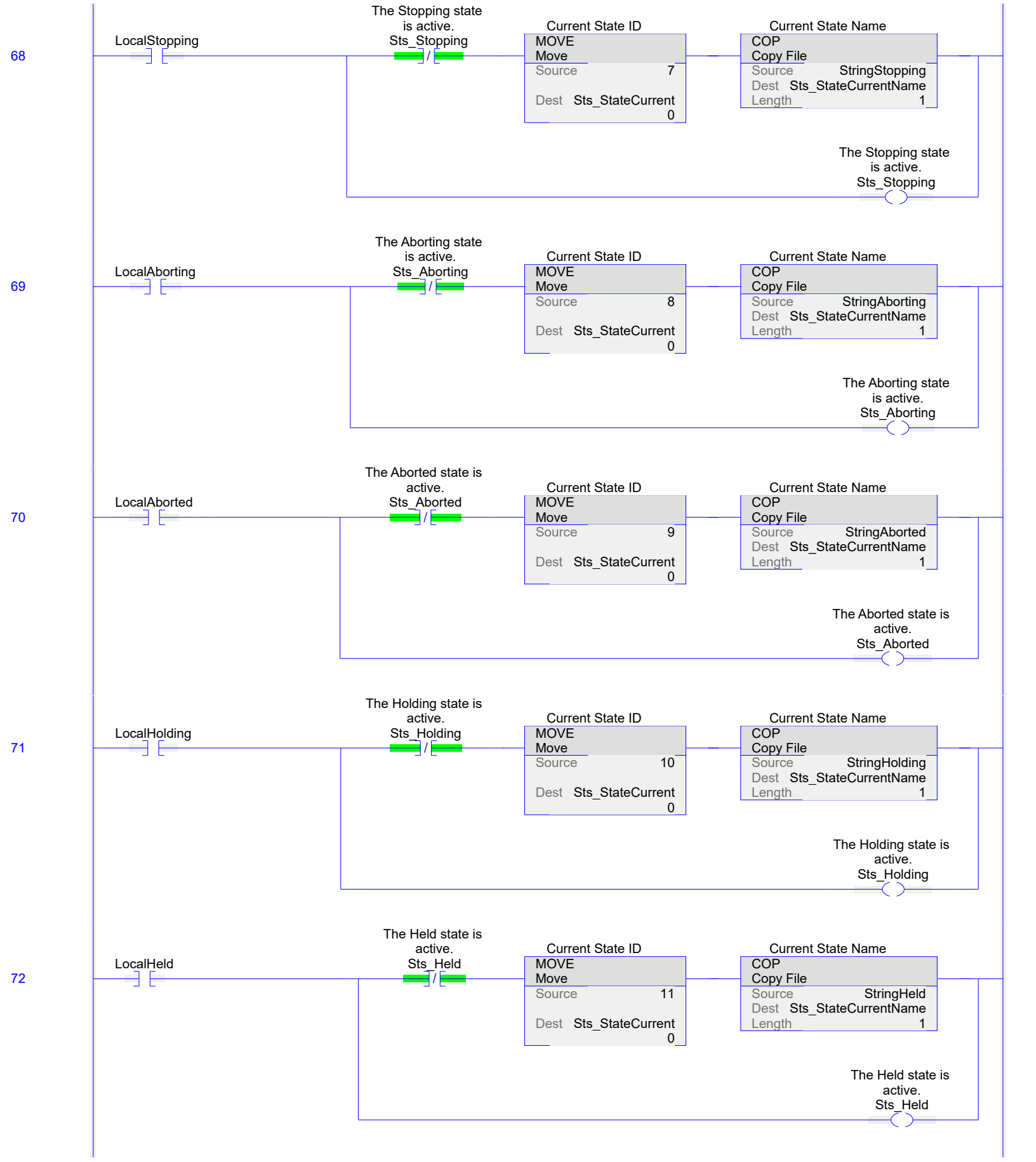


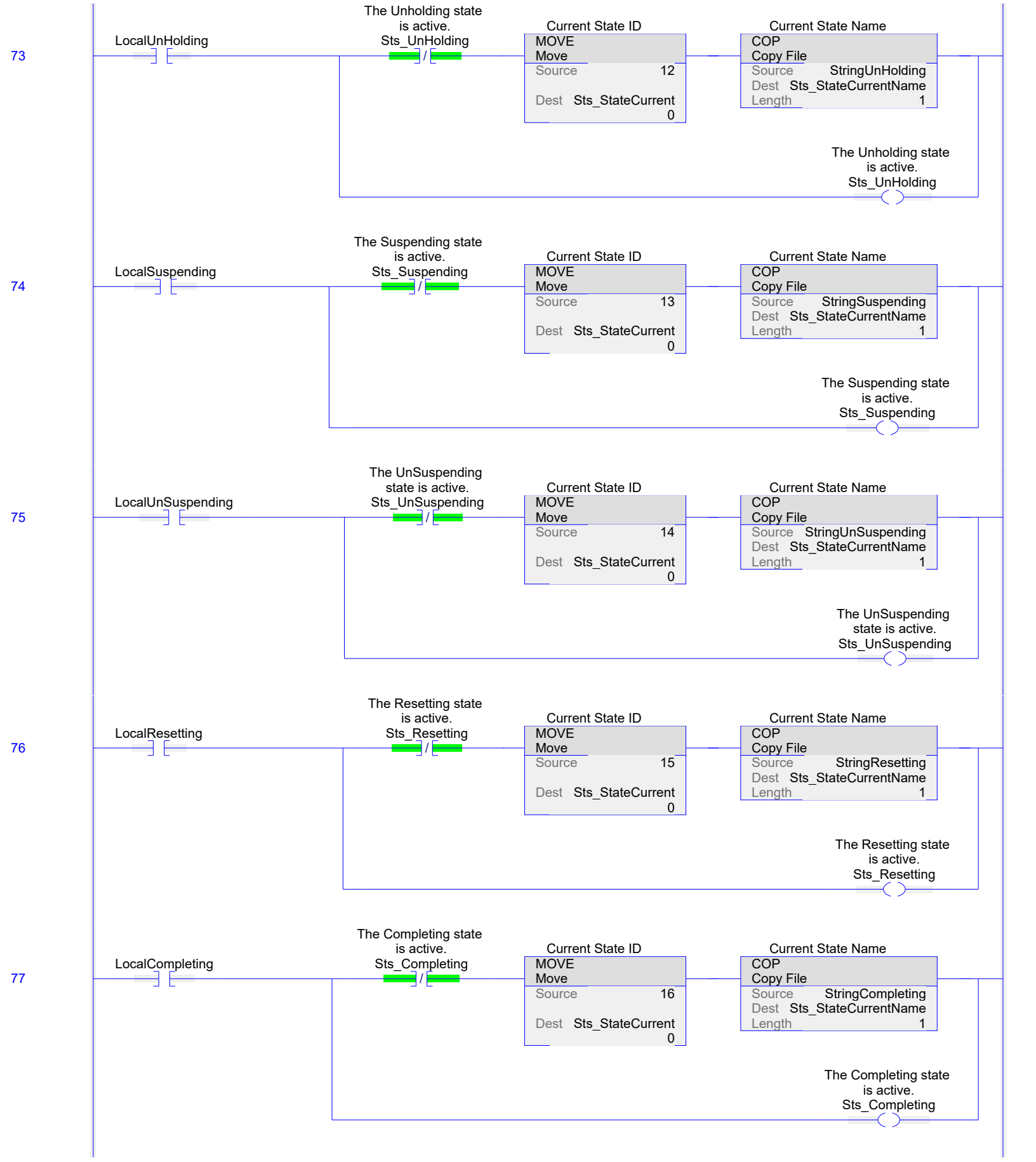


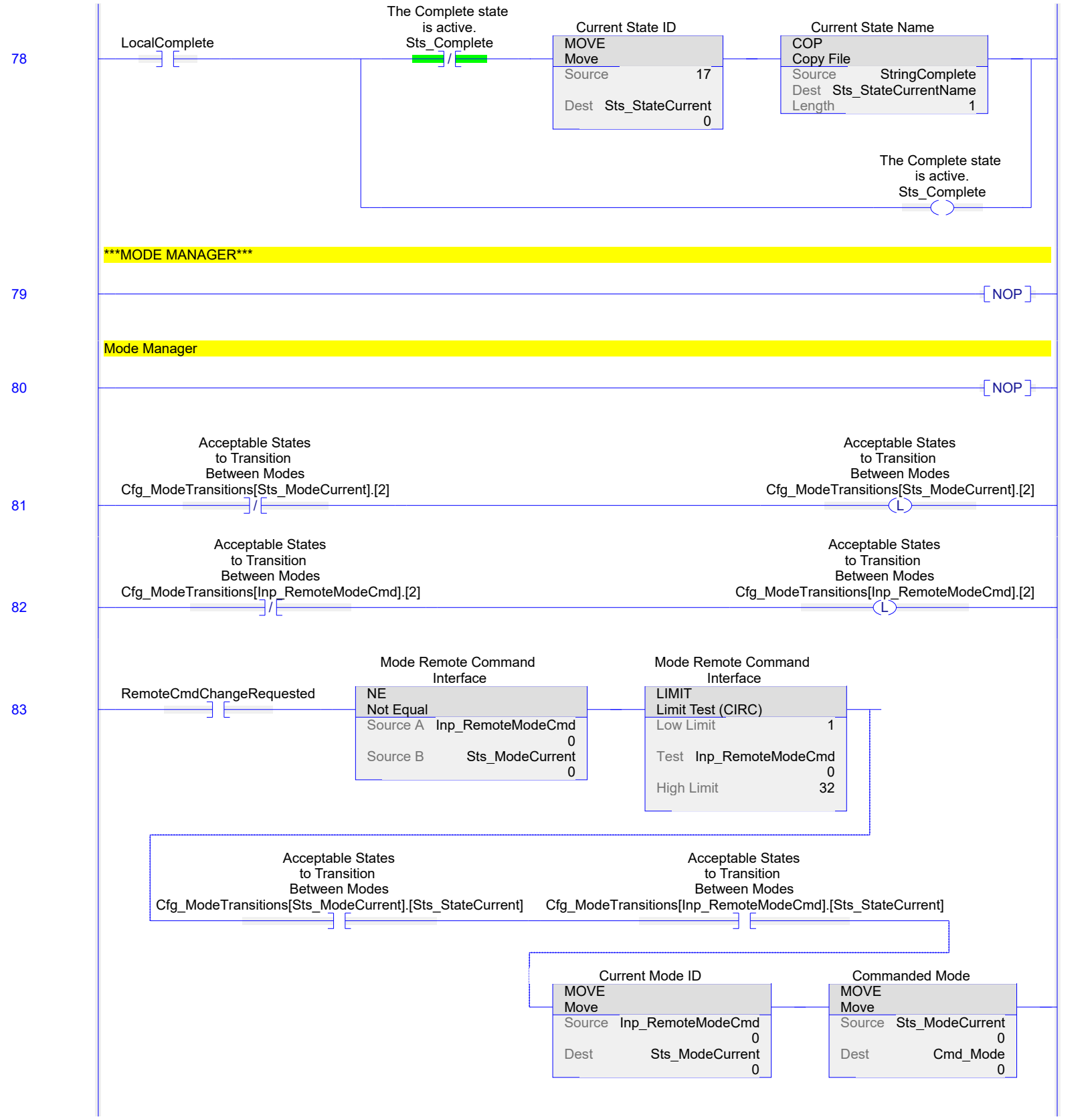


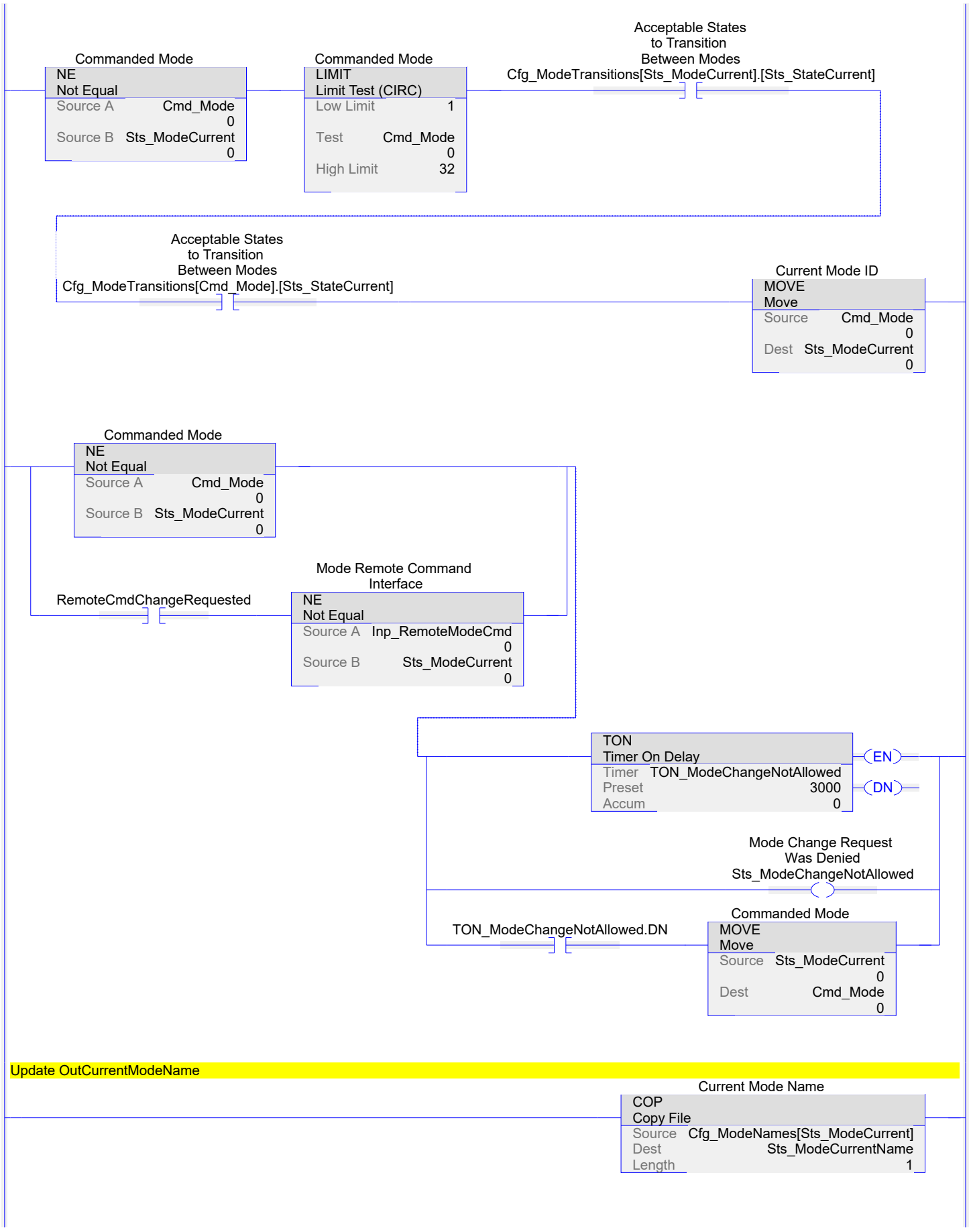

Request that current state transition to Aborting
Cmd_Abort
AbortRemoteCmd
LocalResetting
LocalIdle
LocalStarting
LocalExecute
LocalHolding
LocalHeld
LocalUnHolding
LocalSuspending
LocalSuspended
LocalUnSuspending
LocalCompleting
LocalComplete
LocalStopping
LocalStopped
LocalClearing
LocalResetting
LocalAborting
60
Update OutCurrentState
61
NOP
LocalClearing
The Clearing state is active.
Sts_Clearing
Current State ID
MOVE
Move
Source 1
Dest Sts_StateCurrent
0
Current State Name
COP
Copy File
Source StringClearing
Dest Sts_StateCurrentName
Length 1
62
The Clearing state is active.
Sts_Clearing



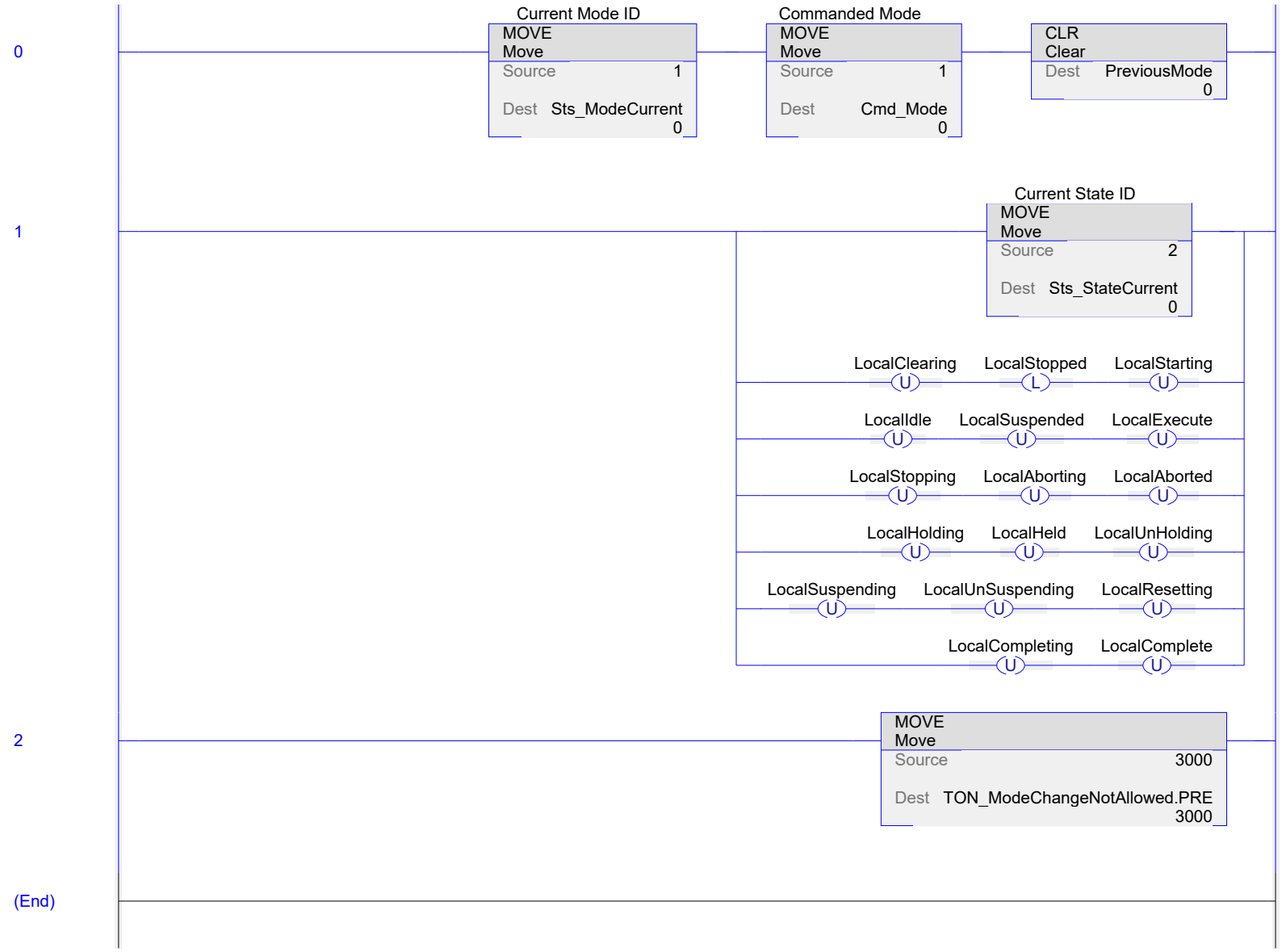



73
LocalUnHolding
The Unholding state is active. Sts_UnHolding
Current State ID
MOVE
Move
Source 12
Dest Sts_StateCurrent 0
Current State Name
COP
Copy File
Source StringUnHolding
Dest Sts_StateCurrentName
Length 1
The Unholding state is active. Sts_UnHolding
74
LocalSuspending
The Suspending state is active. Sts_Suspending
Current State ID
MOVE
Move
Source 13
Dest Sts_StateCurrent 0
Current State Name
COP
Copy File
Source StringSuspending
Dest Sts_StateCurrentName
Length 1
The Suspending state is active. Sts_Suspending
75
LocalUnSuspending
The UnSuspending state is active. Sts_UnSuspending
Current State ID
MOVE
Move
Source 14
Dest Sts_StateCurrent 0
Current State Name
COP
Copy File
Source StringUnSuspending
Dest Sts_StateCurrentName
Length 1
The UnSuspending state is active. Sts_UnSuspending
76
LocalResetting
The Resetting state is active. Sts_Resetting
Current State ID
MOVE
Move
Source 15
Dest Sts_StateCurrent 0
Current State Name
COP
Copy File
Source StringResetting
Dest Sts_StateCurrentName
Length 1
The Resetting state is active. Sts_Resetting
77
LocalCompleting
The Completing state is active. Sts_Completing
Current State ID
MOVE
Move
Source 16
Dest Sts_StateCurrent 0
Current State Name
COP
Copy File
Source StringCompleting
Dest Sts_StateCurrentName
Length 1
The Completing state is active. Sts_Completing




84
Commanded Mode
NE
Not Equal
Source A Cmd_Mode 0
Source B Sts_ModeCurrent 0
Commanded Mode
LIMIT
Limit Test (CIRC)
Low Limit 1
Test Cmd_Mode 0
High Limit 32
Acceptable States to Transition Between Modes
Cfg_ModeTransitions[Sts_ModeCurrent].[Sts_StateCurrent]
Acceptable States to Transition Between Modes
Cfg_ModeTransitions[Cmd_Mode].[Sts_StateCurrent]
Current Mode ID
MOVE
Move
Source Cmd_Mode 0
Dest Sts_ModeCurrent 0
85
Commanded Mode
NE
Not Equal
Source A Cmd_Mode 0
Source B Sts_ModeCurrent 0
RemoteCmdChangeRequested
Mode Remote Command Interface
NE
Not Equal
Source A Inp_RemoteModeCmd 0
Source B Sts_ModeCurrent 0
TON
Timer On Delay
Timer TON_ModeChangeNotAllowed
Preset 3000
Accum 0
EN
DN
Mode Change Request Was Denied
Sts_ModeChangeNotAllowed
TON_ModeChangeNotAllowed.DN
Commanded Mode
MOVE
Move
Source Sts_ModeCurrent 0
Dest Cmd_Mode 0
Update OutCurrentModeName
86
Current Mode Name
COP
Copy File
Source Cfg_ModeNames[Sts_ModeCurrent]
Dest Sts_ModeCurrentName
Length 1

(End)


0
Current Mode ID
MOVE
Move
Source 1
Dest Sts_ModeCurrent
0
Commanded Mode
MOVE
Move
Source 1
Dest Cmd_Mode
0
CLR
Clear
Dest PreviousMode
0
1
Current State ID
MOVE
Move
Source 2
Dest Sts_StateCurrent
0
LocalClearing
LocalStopped
LocalStarting
LocalIdle
LocalSuspended
LocalExecute
LocalStopping
LocalAborting
LocalAborted
LocalHolding
LocalHeld
LocalUnHolding
LocalSuspending
LocalUnSuspending
LocalResetting
LocalCompleting
LocalComplete
2
MOVE
Move
Source 3000
Dest TON_ModeChangeNotAllowed.PRE
3000
(End)

