

Enhanced AIM Update – Version 1.0.1.0

Speed Up the Feed Complete Cycle

Overview

Note: These changes affect the PLC sequence timing only. The feed times and accuracy of the feeds themselves are not affected.

The following enhancements to the E_AIM driver should speed up the Feed Complete cycle by reducing the debounce timer, and by reducing the time for the Auto Feed Command Acknowledgement sequence.

These changes affect the PLC's program sequence by allowing the feeds to be Acknowledged almost immediately. It also changes the Feed Complete sequence so that it no longer waits for the Acknowledge Request bit from the Feed's cyclic data to turn off before setting the Feed Complete bit.

To complete the change, two timer values are reduced.

- E_AIM.Configuration.ACKHandshakeTimerPreset – this timer controls how quickly the Auto Feed Acknowledge will be performed by the Enhanced AIM. This value can be left large if the PLC programmer prefers to have their own logic Acknowledge each feed so they can have better control of the sequence timing. Original value was 3000 milliseconds. New value is 100 milliseconds.
- E_AIM.Configuration.FeedNotActiveTimerPreset – this timer controls how long the Enhanced AIM will wait after the Cycle Active bit goes off before flagging a feed as being complete. It is used to debounce the signal coming back from the Q.i's cyclic data, and helps to avoid false feed complete signals in the case of communication issues between the PLC and the Q.i. Original value was 2000 milliseconds. New value is 100 milliseconds.

ATTENTION!

These changes should be performed OFFLINE, and then applied when the PLC process is not running. Mettler-Toledo accepts no responsibility or liability for damage, injury, or lost production that results from the contents of this update. The programmer and process owner must provide proper due diligence for the safety of the process.

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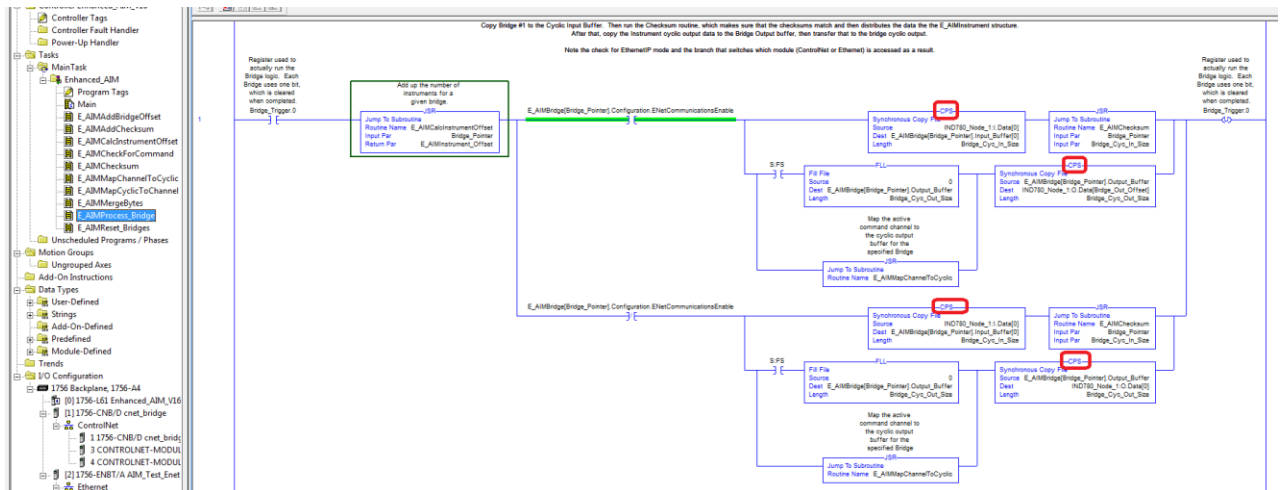
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PLC Program Changes

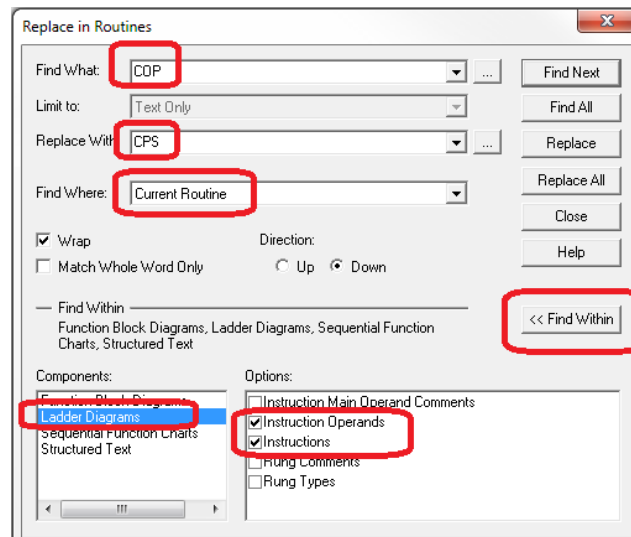
To update the original version, replace the following routines with the ones from the updated version (Enhanced_AIM_V16_1010.ACD):

- Main - this only updates the version numbers. You can do this manually if you prefer.
- E_AIMCheckForCommand
- E_AIMMapCyclicToChannel

Then, in E_AIMProcess_Bridge, change the four **COP** instructions in each rung to **CPS** instructions as shown below. Do this for each Bridge that you are using (there's no need to change all 10 rungs if you only have 1 or 2 IND780's with PLC Bridge cards talking to the PLC – just change the ones that are being used).



Or, execute the following Replace command in the E_AIMProcess_Bridge routine to update all of the COP instructions in all rungs to CPS instructions:

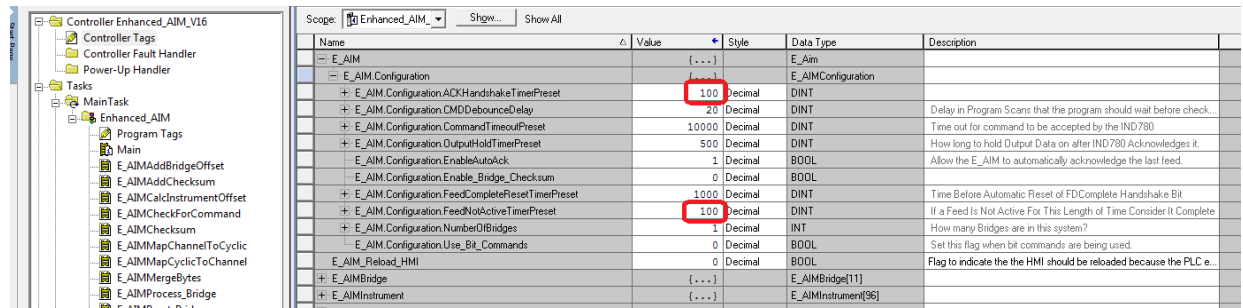


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PLC Configuration Changes

Make the following indicated changes to the Setup Configuration.



Name	Value	Style	Data Type	Description
E_AIM	{...}		E_Aim	
E_AIM.Configuration	{...}		E_AIMConfiguration	
E_AIM.Configuration.ACKHandshakeTimerPreset	100	Decimal	DINT	
E_AIM.Configuration.CMDDebounceDelay	20	Decimal	DINT	Delay in Program Scans that the program should wait before check...
E_AIM.Configuration.CommandTimeoutPreset	10000	Decimal	DINT	Time out for command to be accepted by the IND780
E_AIM.Configuration.OutputHoldTimerPreset	500	Decimal	DINT	How long to hold Output Data on after IND780 Acknowledges it.
E_AIM.Configuration.EnableAutoAck	1	Decimal	BOOL	Allow the E_AIM to automatically acknowledge the last feed.
E_AIM.Configuration.Enable_Bridge_Checksum	0	Decimal	BOOL	
E_AIM.Configuration.FeedCompleteResetTimerPreset	1000	Decimal	DINT	Time Before Automatic Reset of FDComplete Handshake Bit
E_AIM.Configuration.FeedNotActiveTimerPreset	100	Decimal	DINT	If a Feed Is Not Active For This Length of Time Consider It Complete
E_AIM.Configuration.NumberOfBridges	1	Decimal	INT	How many Bridges are in this system?
E_AIM.Configuration.Use_Bit_Commands	0	Decimal	BOOL	Set this flag when bit commands are being used.
E_AIM.Reload_HMI	0	Decimal	BOOL	Flag to indicate the HMI should be reloaded because the PLC e...
E_AIMBridge	{...}		E_AIMBridge[11]	
E_AIMInstrument	{...}		E_AIMInstrument[96]	

Change Details

The following enhancements to the E_AIM driver should speed up the Feed Complete cycle by reducing the debounce timer, and by reducing the time for the Auto Feed Command Acknowledgement sequence.

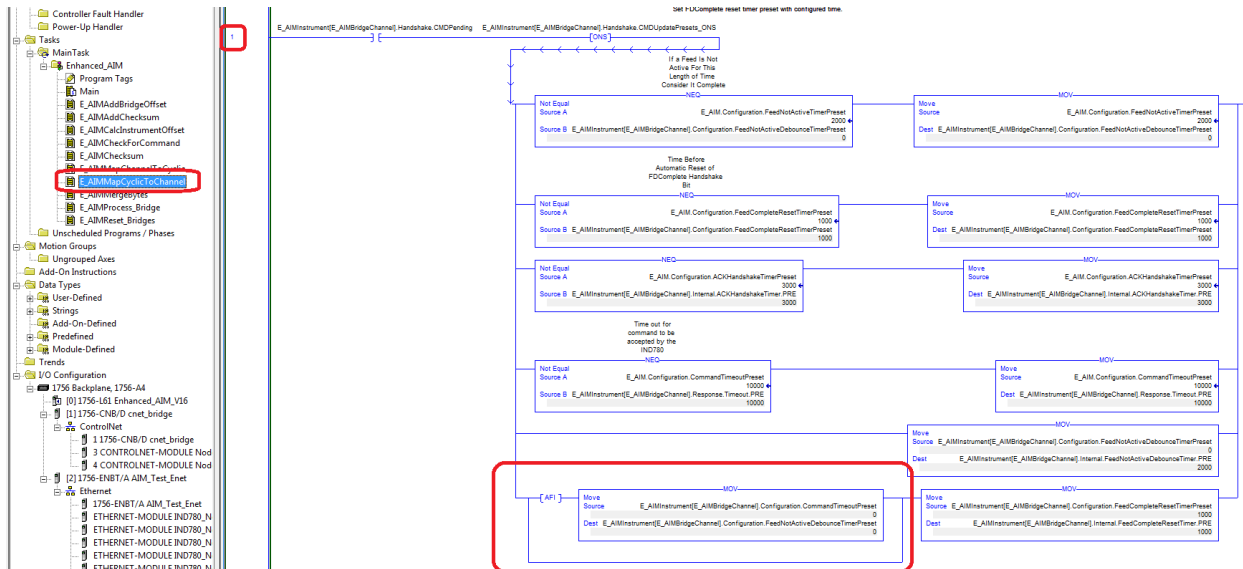
These details are provided for those who would prefer to update the routines themselves instead of copy the routines from the updated version of the Enhanced_AIM Master.

The “E_AIMMapCyclicToChannel” Routine

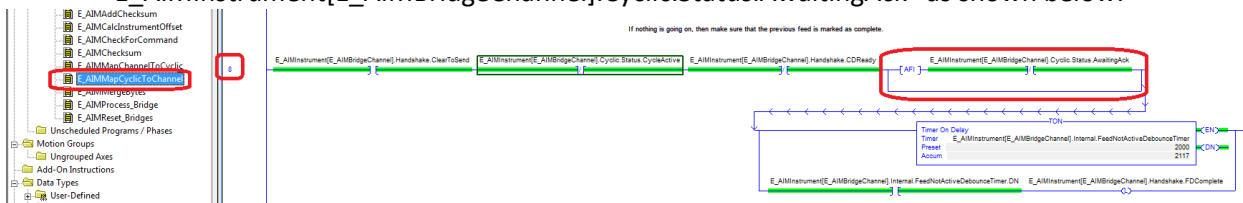
1. In rung 1, remove the MOV statement that moves the “E_AIMInstrument[E_AIMBridgeChannel].Configuration.CommandTimeoutPreset” to “E_AIMInstrument[E_AIMBridgeChannel].Configuration.FeedNotActiveDebounceTimerPreset” as shown below.

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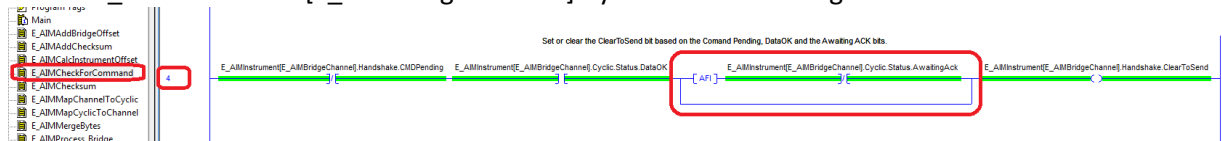


- In rung 8, remove the test for “E_AIMInstrument[E_AIMBridgeChannel].Cyclic.Status.AwaitingAck” as shown below.



The “E_AIMCheckForCommand” Routine

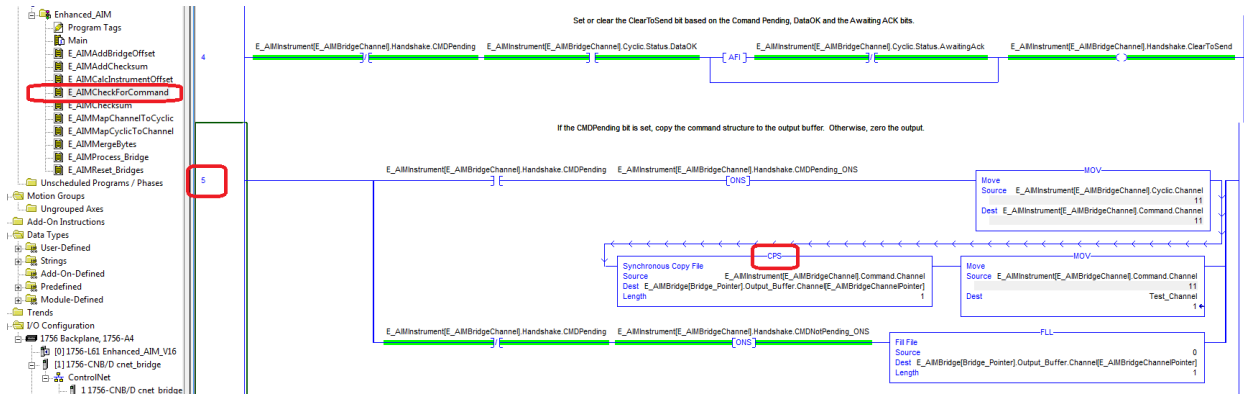
- In rung 4, remove the test for “E_AIMInstrument[E_AIMBridgeChannel].Cyclic.Status.AwaitingAck” as shown below.



- Change the COP instruction on rung 5 to a CPS instruction as shown below.

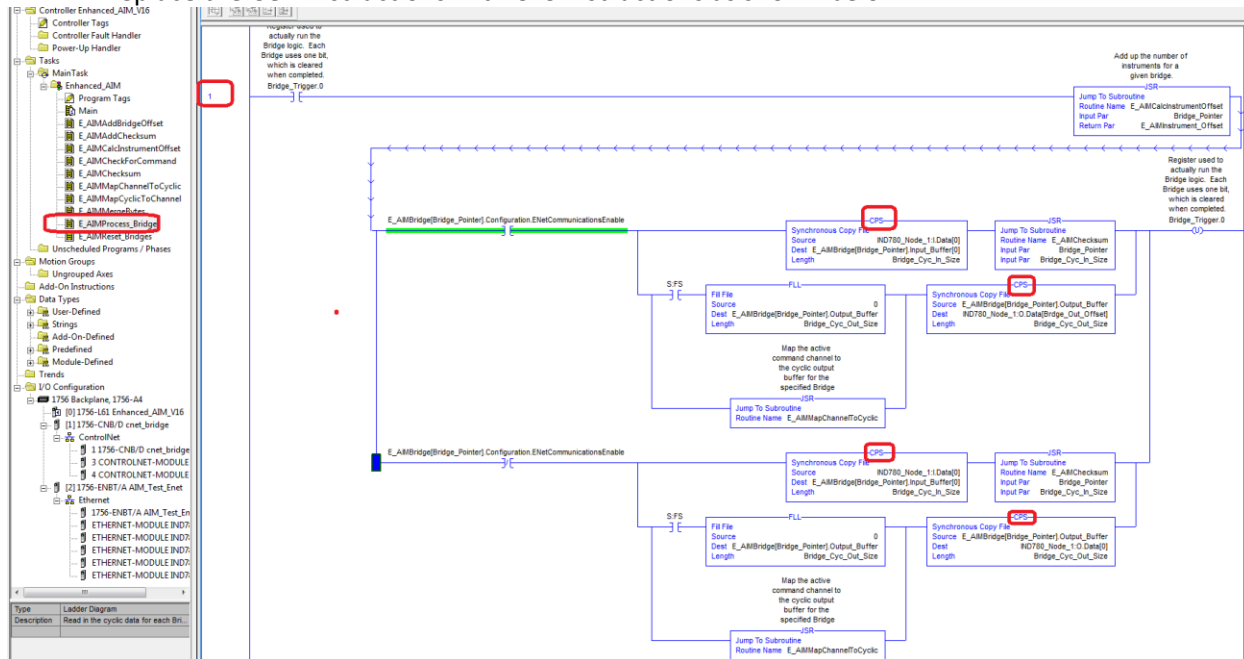
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The “E_AIMProcess_Bridge” Routine

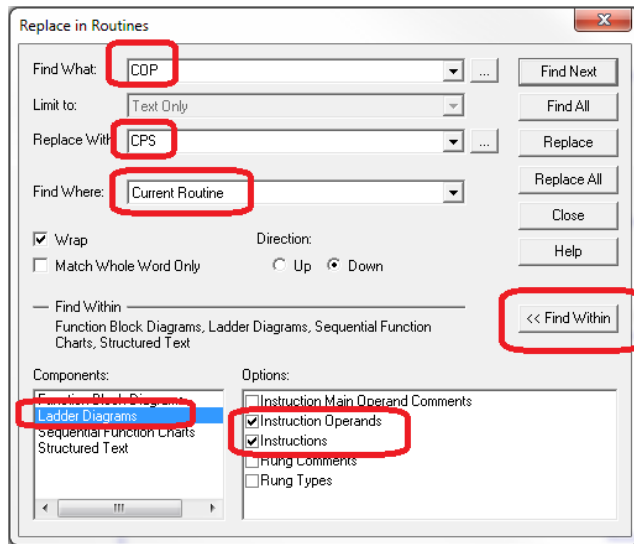
Replace the COP instructions with CPS instructions as shown below.



The following Replace instruction will update the entire routine:

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PLC Program Configuration Changes

Make the following configuration changes as shown below

1. Set the “E_AIM.Configuration.ACKHandshakeTimerPreset” to 100.
2. Set the “E_AIM.Configuration.FeedNotActiveTimerPreset” to 100.

<div> <div>Controller Enhanced_AIM_V16</div> <div> <div>Controller Tags</div> <div>Controller Fault Handler</div> <div>Power-Up Handler</div> <div>Tasks</div> <div>MainTask</div> <div>Enhanced_AIM</div> <div>Program Tags</div> <div>Main</div> <div>E_AIMAddBridgeOffset</div> <div>E_AIMAddChecksum</div> <div>E_AIMCalcInstrumentOffset</div> <div>E_AIMCheckForCommand</div> <div>E_AIMChecksum</div> <div>E_AIMMapChannelToCyclic</div> <div>E_AIMMapCyclicToChannel</div> </div> </div>	<div> <div>Scope: Enhanced_AIM_ Show All</div> <table> <tr> <th>Name</th><th>Value</th><th>Style</th><th>Data Type</th><th>Description</th></tr> <tr> <td>E_AIM</td><td>[...]</td><td></td><td>E_Aim</td><td></td></tr> <tr> <td>E_AIM.Configuration</td><td></td><td></td><td>E_AIMConfiguration</td><td></td></tr> <tr> <td>+ E_AIM.Configuration.ACKHandshakeTimerPreset</td><td>100</td><td>Decimal</td><td>DINT</td><td></td></tr> <tr> <td>+ E_AIM.Configuration.CMDDebounceDelay</td><td>20</td><td>Decimal</td><td>DINT</td><td>Delay in Program Scans that the program should wait before check...</td></tr> <tr> <td>+ E_AIM.Configuration.CommandTimeoutPreset</td><td>10000</td><td>Decimal</td><td>DINT</td><td>Time out for command to be accepted by the IND780</td></tr> <tr> <td>+ E_AIM.Configuration.OutputHoldTimerPreset</td><td>500</td><td>Decimal</td><td>DINT</td><td>How long to hold Output Data on after IND780 Acknowledges it.</td></tr> <tr> <td>E_AIM.Configuration.EnableAutoAck</td><td>1</td><td>Decimal</td><td>BOOL</td><td>Allow the E_AIM to automatically acknowledge the last feed.</td></tr> <tr> <td>E_AIM.Configuration.Enable_Bridge_Checksum</td><td>0</td><td>Decimal</td><td>BOOL</td><td></td></tr> <tr> <td>+ E_AIM.Configuration.FeedCompleteResetTimerPreset</td><td>1000</td><td>Decimal</td><td>DINT</td><td>Time Before Automatic Reset of FDComplete Handshake Bit</td></tr> <tr> <td>+ E_AIM.Configuration.FeedNotActiveTimerPreset</td><td>100</td><td>Decimal</td><td>DINT</td><td>If a Feed is Not Active For This Length of Time Consider It Complete</td></tr> <tr> <td>+ E_AIM.Configuration.NumberOfBridges</td><td>7</td><td>Decimal</td><td>INT</td><td>How many Bridges are in this system?</td></tr> <tr> <td>E_AIM.Configuration.Use_Bit_Commands</td><td>0</td><td>Decimal</td><td>BOOL</td><td>Set this flag when bit commands are being used.</td></tr> <tr> <td>E_AIM.Reload_HMI</td><td>0</td><td>Decimal</td><td>BOOL</td><td>Flag to indicate the HMI should be reloaded because the PLC e...</td></tr> </table> </div>					Name	Value	Style	Data Type	Description	E_AIM	[...]		E_Aim		E_AIM.Configuration			E_AIMConfiguration		+ E_AIM.Configuration.ACKHandshakeTimerPreset	100	Decimal	DINT		+ E_AIM.Configuration.CMDDebounceDelay	20	Decimal	DINT	Delay in Program Scans that the program should wait before check...	+ E_AIM.Configuration.CommandTimeoutPreset	10000	Decimal	DINT	Time out for command to be accepted by the IND780	+ E_AIM.Configuration.OutputHoldTimerPreset	500	Decimal	DINT	How long to hold Output Data on after IND780 Acknowledges it.	E_AIM.Configuration.EnableAutoAck	1	Decimal	BOOL	Allow the E_AIM to automatically acknowledge the last feed.	E_AIM.Configuration.Enable_Bridge_Checksum	0	Decimal	BOOL		+ E_AIM.Configuration.FeedCompleteResetTimerPreset	1000	Decimal	DINT	Time Before Automatic Reset of FDComplete Handshake Bit	+ E_AIM.Configuration.FeedNotActiveTimerPreset	100	Decimal	DINT	If a Feed is Not Active For This Length of Time Consider It Complete	+ E_AIM.Configuration.NumberOfBridges	7	Decimal	INT	How many Bridges are in this system?	E_AIM.Configuration.Use_Bit_Commands	0	Decimal	BOOL	Set this flag when bit commands are being used.	E_AIM.Reload_HMI	0	Decimal	BOOL	Flag to indicate the HMI should be reloaded because the PLC e...
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