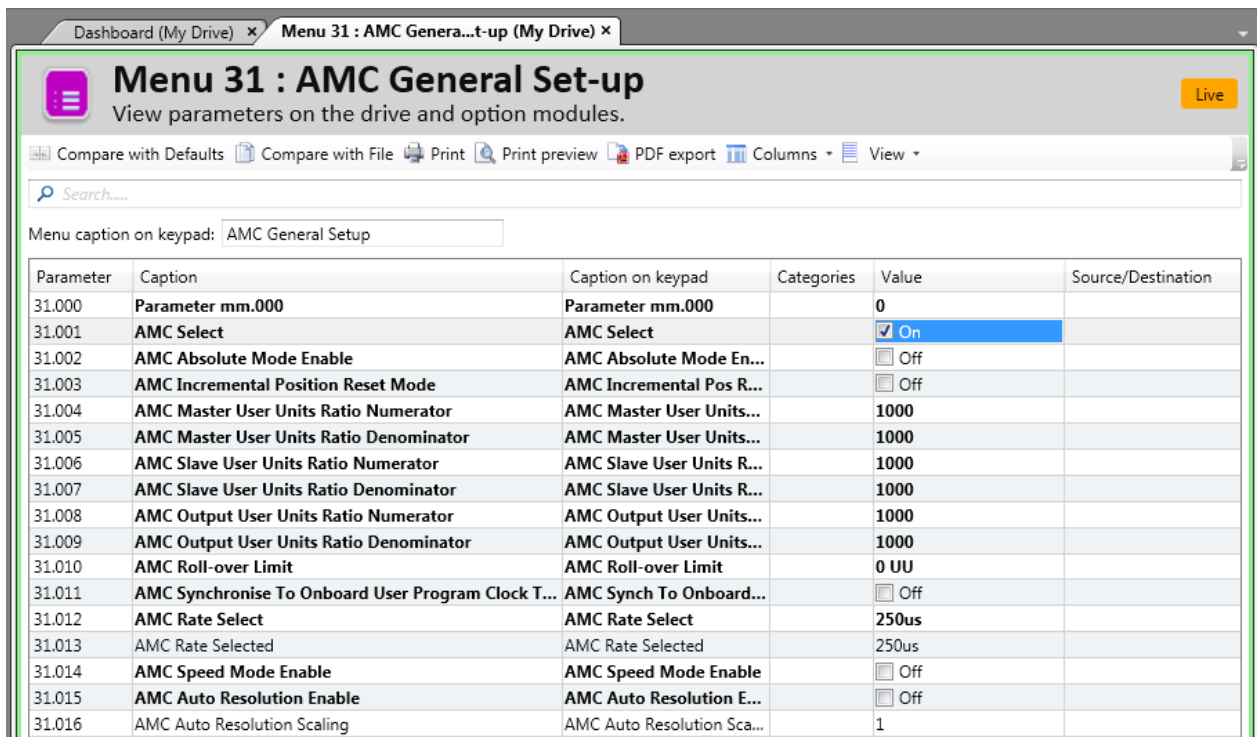


This Application Note applies to M700 – M702 drives

Basic AMC Setup using Unidrive M Connect Software

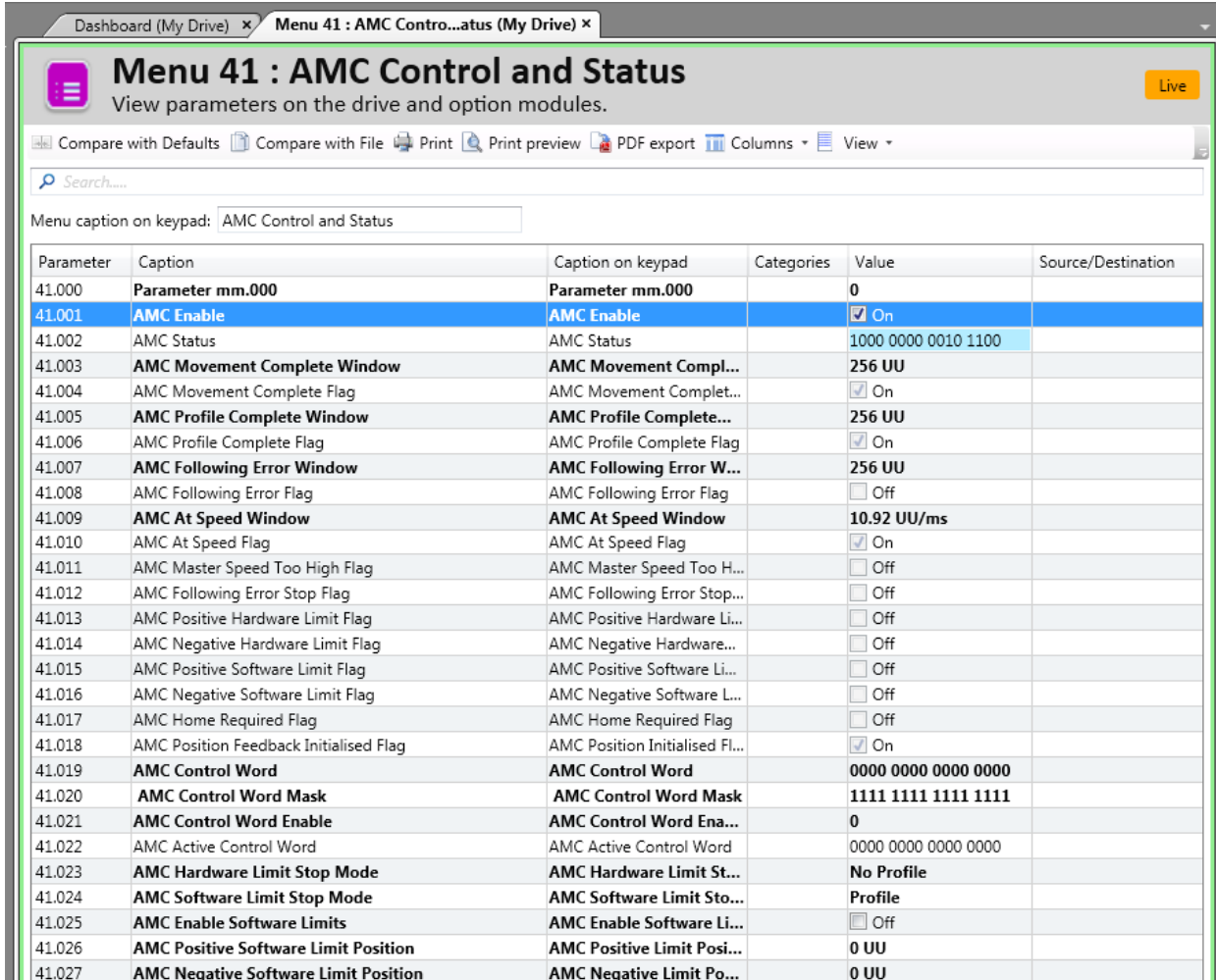
This application note will show the initial parameter setup required for the AMC using Unidrive M Connect software. Furthermore this application note will not address motor and feedback setup for the servo motor connected to the drive. Please refer to application note AN0009 M700 Demo Basic Drive Motor Setup using M Connect Software for step by step setup of a M700 used in RFC-S mode connected to a servo motor for details on motor and feedback device setup. An Ethernet patch cable connected to M700 demo unit with a PC static IP address set to IP address 192.168.1.100 will be used for demonstration purposes and all live screen captures in this document.

First go to Menu 31: AMC General Set-up and set Pr 31.001 AMC Select = On



Parameter	Caption	Caption on keypad	Categories	Value	Source/Destination
31.000	Parameter mm.000	Parameter mm.000		0	
31.001	AMC Select	AMC Select		<input checked="" type="checkbox"/> On	
31.002	AMC Absolute Mode Enable	AMC Absolute Mode En...		<input type="checkbox"/> Off	
31.003	AMC Incremental Position Reset Mode	AMC Incremental Pos R...		<input type="checkbox"/> Off	
31.004	AMC Master User Units Ratio Numerator	AMC Master User Units...		1000	
31.005	AMC Master User Units Ratio Denominator	AMC Master User Units...		1000	
31.006	AMC Slave User Units Ratio Numerator	AMC Slave User Units R...		1000	
31.007	AMC Slave User Units Ratio Denominator	AMC Slave User Units R...		1000	
31.008	AMC Output User Units Ratio Numerator	AMC Output User Units...		1000	
31.009	AMC Output User Units Ratio Denominator	AMC Output User Units...		1000	
31.010	AMC Roll-over Limit	AMC Roll-over Limit		0 UU	
31.011	AMC Synchronise To Onboard User Program Clock T...	AMC Synch To Onboard...		<input type="checkbox"/> Off	
31.012	AMC Rate Select	AMC Rate Select		250us	
31.013	AMC Rate Selected	AMC Rate Selected		250us	
31.014	AMC Speed Mode Enable	AMC Speed Mode Enable		<input type="checkbox"/> Off	
31.015	AMC Auto Resolution Enable	AMC Auto Resolution E...		<input type="checkbox"/> Off	
31.016	AMC Auto Resolution Scaling	AMC Auto Resolution Sca...		1	

Next go to Menu 41: AMC Control and Status and set Pr 41.001 AMC Enable = On



Dashboard (My Drive) x Menu 41 : AMC Contro...atus (My Drive) x

Menu 41 : AMC Control and Status

View parameters on the drive and option modules. Live

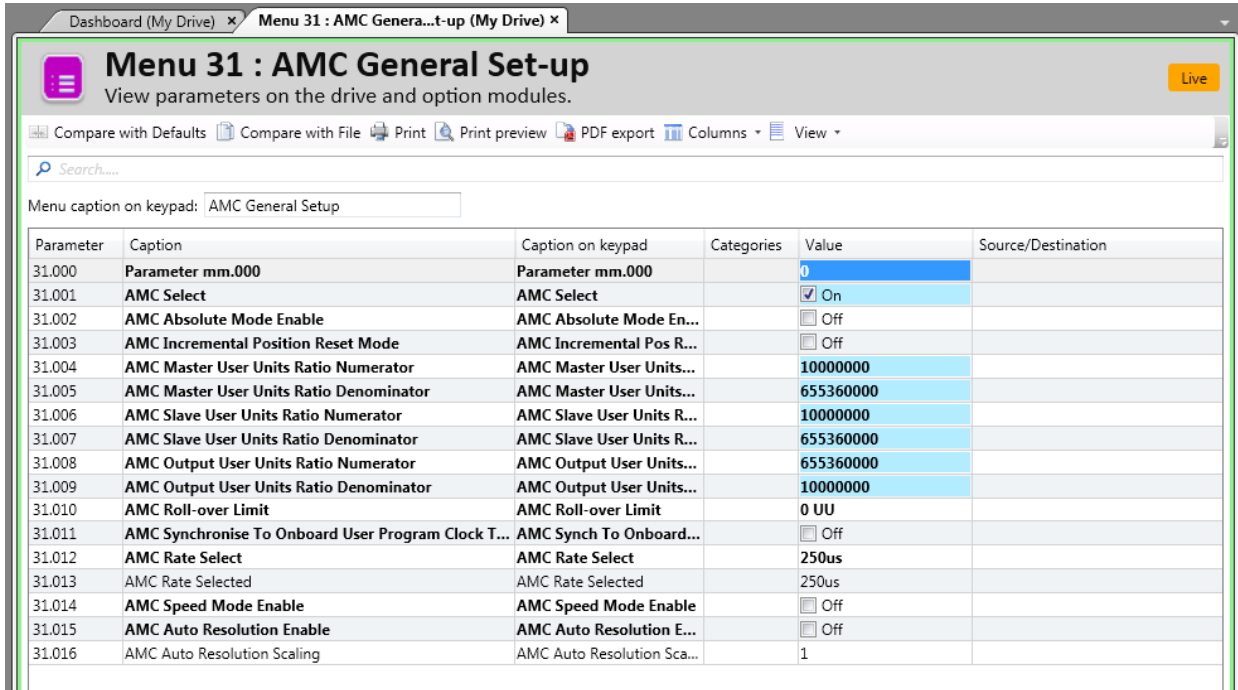
Compare with Defaults Compare with File Print Print preview PDF export Columns View

Search...

Menu caption on keypad: AMC Control and Status

Parameter	Caption	Caption on keypad	Categories	Value	Source/Destination
41.000	Parameter mm.000	Parameter mm.000		0	
41.001	AMC Enable	AMC Enable		<input checked="" type="checkbox"/> On	
41.002	AMC Status	AMC Status		1000 0000 0010 1100	
41.003	AMC Movement Complete Window	AMC Movement Compl...		256 UU	
41.004	AMC Movement Complete Flag	AMC Movement Complet...		<input checked="" type="checkbox"/> On	
41.005	AMC Profile Complete Window	AMC Profile Complete...		256 UU	
41.006	AMC Profile Complete Flag	AMC Profile Complete Flag		<input checked="" type="checkbox"/> On	
41.007	AMC Following Error Window	AMC Following Error W...		256 UU	
41.008	AMC Following Error Flag	AMC Following Error Flag		<input type="checkbox"/> Off	
41.009	AMC At Speed Window	AMC At Speed Window		10.92 UU/ms	
41.010	AMC At Speed Flag	AMC At Speed Flag		<input checked="" type="checkbox"/> On	
41.011	AMC Master Speed Too High Flag	AMC Master Speed Too H...		<input type="checkbox"/> Off	
41.012	AMC Following Error Stop Flag	AMC Following Error Stop...		<input type="checkbox"/> Off	
41.013	AMC Positive Hardware Limit Flag	AMC Positive Hardware Li...		<input type="checkbox"/> Off	
41.014	AMC Negative Hardware Limit Flag	AMC Negative Hardware...		<input type="checkbox"/> Off	
41.015	AMC Positive Software Limit Flag	AMC Positive Software Li...		<input type="checkbox"/> Off	
41.016	AMC Negative Software Limit Flag	AMC Negative Software L...		<input type="checkbox"/> Off	
41.017	AMC Home Required Flag	AMC Home Required Flag		<input type="checkbox"/> Off	
41.018	AMC Position Feedback Initialised Flag	AMC Position Initialised Fl...		<input checked="" type="checkbox"/> On	
41.019	AMC Control Word	AMC Control Word		0000 0000 0000 0000	
41.020	AMC Control Word Mask	AMC Control Word Mask		1111 1111 1111 1111	
41.021	AMC Control Word Enable	AMC Control Word Ena...		0	
41.022	AMC Active Control Word	AMC Active Control Word		0000 0000 0000 0000	
41.023	AMC Hardware Limit Stop Mode	AMC Hardware Limit St...		No Profile	
41.024	AMC Software Limit Stop Mode	AMC Software Limit Sto...		Profile	
41.025	AMC Enable Software Limits	AMC Enable Software Li...		<input type="checkbox"/> Off	
41.026	AMC Positive Software Limit Position	AMC Positive Limit Posi...		0 UU	
41.027	AMC Negative Software Limit Position	AMC Negative Limit Po...		0 UU	

Enter the User Units parameters Pr 31.004 through Pr 31.009 as shown to set up the AMC for Motor revolutions. This will then require the user to enter AMC distances in Motor revolutions with a resolution of thousandths of a motor revolution; 1000 UU = 1.000 motor revolutions; and AMC speed references in UU/mSec; 1.00 UU/mSec = 60 motor rpm.



Dashboard (My Drive) × Menu 31 : AMC Genera...t-up (My Drive) ×

Menu 31 : AMC General Set-up

View parameters on the drive and option modules. Live

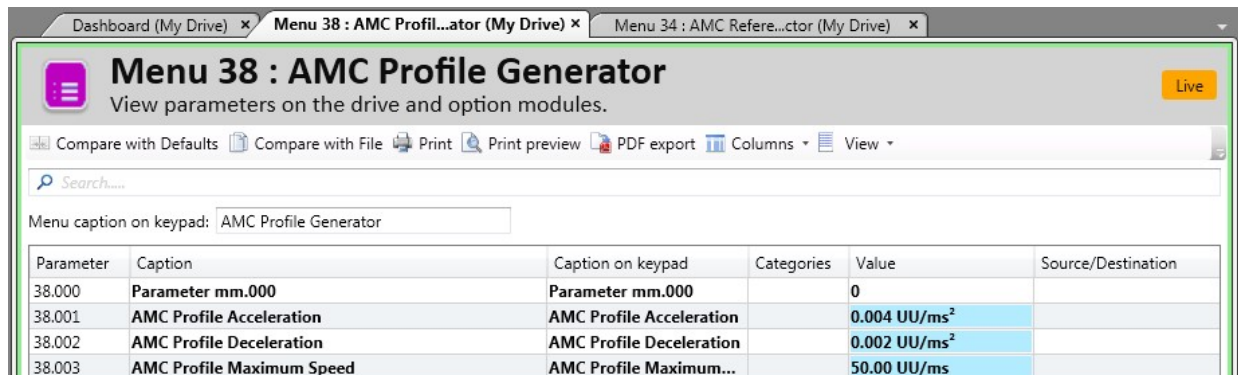
Compare with Defaults Compare with File Print Print preview PDF export Columns View

Search...

Menu caption on keypad: AMC General Setup

Parameter	Caption	Caption on keypad	Categories	Value	Source/Destination
31.000	Parameter mm.000	Parameter mm.000		0	
31.001	AMC Select	AMC Select		<input checked="" type="checkbox"/> On	
31.002	AMC Absolute Mode Enable	AMC Absolute Mode En...		<input type="checkbox"/> Off	
31.003	AMC Incremental Position Reset Mode	AMC Incremental Pos R...		<input type="checkbox"/> Off	
31.004	AMC Master User Units Ratio Numerator	AMC Master User Units...		10000000	
31.005	AMC Master User Units Ratio Denominator	AMC Master User Units...		655360000	
31.006	AMC Slave User Units Ratio Numerator	AMC Slave User Units R...		10000000	
31.007	AMC Slave User Units Ratio Denominator	AMC Slave User Units R...		655360000	
31.008	AMC Output User Units Ratio Numerator	AMC Output User Units...		655360000	
31.009	AMC Output User Units Ratio Denominator	AMC Output User Units...		10000000	
31.010	AMC Roll-over Limit	AMC Roll-over Limit		0 UU	
31.011	AMC Synchronise To Onboard User Program Clock T...	AMC Synch To Onboard...		<input type="checkbox"/> Off	
31.012	AMC Rate Select	AMC Rate Select		250us	
31.013	AMC Rate Selected	AMC Rate Selected		250us	
31.014	AMC Speed Mode Enable	AMC Speed Mode Enable		<input type="checkbox"/> Off	
31.015	AMC Auto Resolution Enable	AMC Auto Resolution E...		<input type="checkbox"/> Off	
31.016	AMC Auto Resolution Scaling	AMC Auto Resolution Sca...		1	

Enter the AMC Profile Generator setup parameters Pr 38.001 & Pr 38.002 for the AMC acceleration and deceleration. The AMC profile max speed shown below entered in Pr 38.003 will limit the maximum commanded speed to 3000.00 rpm which is the motor maximum speed.



Dashboard (My Drive) × Menu 38 : AMC Profil...ator (My Drive) × Menu 34 : AMC Refere...ctor (My Drive) ×

Menu 38 : AMC Profile Generator

View parameters on the drive and option modules. Live

Compare with Defaults Compare with File Print Print preview PDF export Columns View

Search...

Menu caption on keypad: AMC Profile Generator

Parameter	Caption	Caption on keypad	Categories	Value	Source/Destination
38.000	Parameter mm.000	Parameter mm.000		0	
38.001	AMC Profile Acceleration	AMC Profile Acceleration		0.004 UU/ms ²	
38.002	AMC Profile Deceleration	AMC Profile Deceleration		0.002 UU/ms ²	
38.003	AMC Profile Maximum Speed	AMC Profile Maximum...		50.00 UU/ms	

Enter the motor maximum speed or the maximum speed the motor will be limited to into Pr 39.011.

Dashboard (My Drive) x Menu 39 : AMC Positi...Loop (My Drive) x

Menu 39 : AMC Position Control Loop

View parameters on the drive and option modules. Live

Compare with Defaults Compare with File Print Print preview PDF export Columns View

Search...

Menu caption on keypad: AMC Position Control Loop

Parameter	Caption	Caption on keypad	Categories	Value	Source/Destination
39.000	Parameter mm.000	Parameter mm.000		0	
39.001	AMC External Position Reference Select	AMC External Pos Ref S...		<input type="checkbox"/> Off	
39.002	AMC External Position Reference	AMC External Position...		0 UU	
39.004	AMC External Speed Reference	AMC External Speed Ref		0.00 UU/ms	
39.005	AMC Inertia Compensation Mode	AMC Inertia Compensat...		None	
39.007	AMC Position Control Loop Kp Gain	AMC Position Loop P G...		25.000	
39.008	AMC Position Error	AMC Position Error		0 UU	
39.009	AMC Position Control Loop Speed Clamp	AMC Pos Control Loop...		109.20 UU/ms	
39.010	AMC Speed Feed-forwards Gain	AMC Speed Feed-fwds...		1.000	
39.011	AMC Output Speed Clamp	AMC Output Speed Cla...		3000.0 rpm	

Finally enter the AMC Reference Speed into Pr 34.006. In this example 1.00 UU/ms = 60 rpm.

Dashboard (My Drive) x Menu 34 : AMC Refere...ctor (My Drive) x

Menu 34 : AMC Reference Selector

View parameters on the drive and option modules. Live

Compare with Defaults Compare with File Print Print preview PDF export Columns View

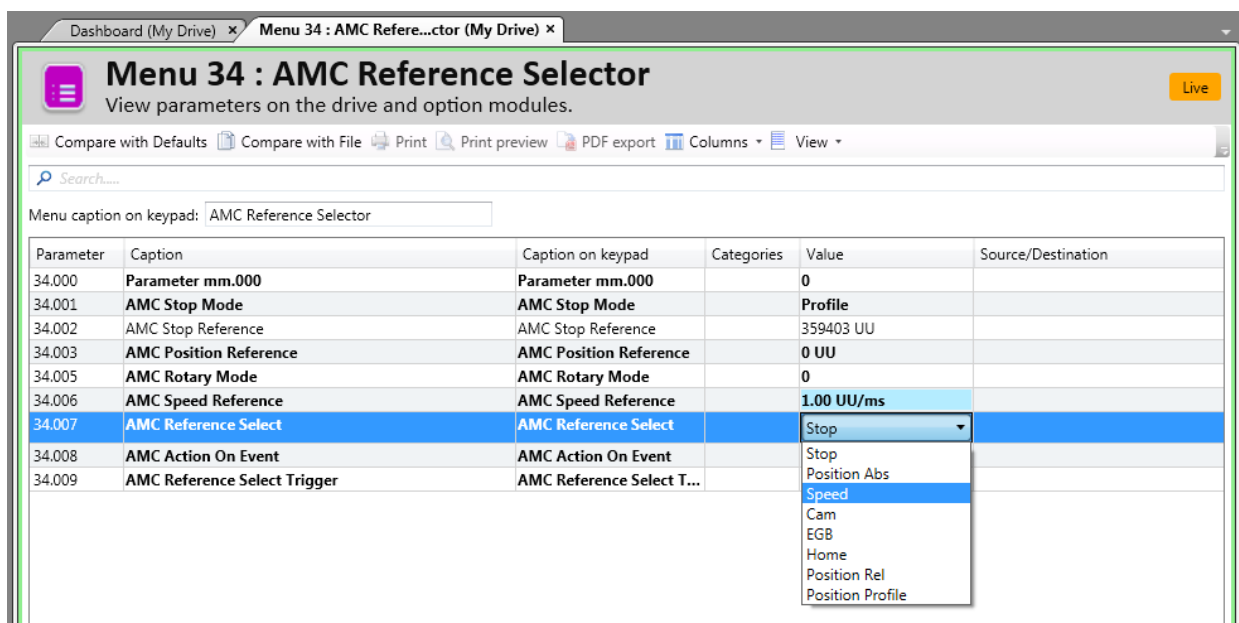
Search...

Menu caption on keypad: AMC Reference Selector

Parameter	Caption	Caption on keypad	Categories	Value	Source/Destination
34.000	Parameter mm.000	Parameter mm.000		0	
34.001	AMC Stop Mode	AMC Stop Mode		Profile	
34.002	AMC Stop Reference	AMC Stop Reference		5000 UU	
34.003	AMC Position Reference	AMC Position Reference		0 UU	
34.005	AMC Rotary Mode	AMC Rotary Mode		0	
34.006	AMC Speed Reference	AMC Speed Reference		1.00 UU/ms	
34.007	AMC Reference Select	AMC Reference Select		Stop	
34.008	AMC Action On Event	AMC Action On Event		None	
34.009	AMC Reference Select Trigger	AMC Reference Select T...		Stop	

The AMC is now ready for use, and now is a good time to save the parameters in the drive before using the AMC. Enable the drive while monitoring the drive keypad; the drive status should change from 'Inhibit' to 'Stop'. A Run command is also needed to use the AMC so the user can turn ON either Run Forward or Run Reverse, and this will change the drive status from 'Stop' to 'Run'.

At this point go to Menu 34 and use parameter Pr 34.007 to run the AMC in Speed Mode by changing it from 'Stop' to 'Speed'. The drive should ramp up to the speed entered in Pr 34.005 AMC Speed Reference following the AMC Profile acceleration rate entered in parameter Pr 38.001. Changing Pr 34.007 to 'Stop' will cause the AMC to ramp the Speed down using the AMC Profile deceleration rate entered in parameter Pr 38.002.



Dashboard (My Drive) x Menu 34 : AMC Refere...ctor (My Drive) x

Menu 34 : AMC Reference Selector

View parameters on the drive and option modules. Live

Compare with Defaults Compare with File Print Print preview PDF export Columns View

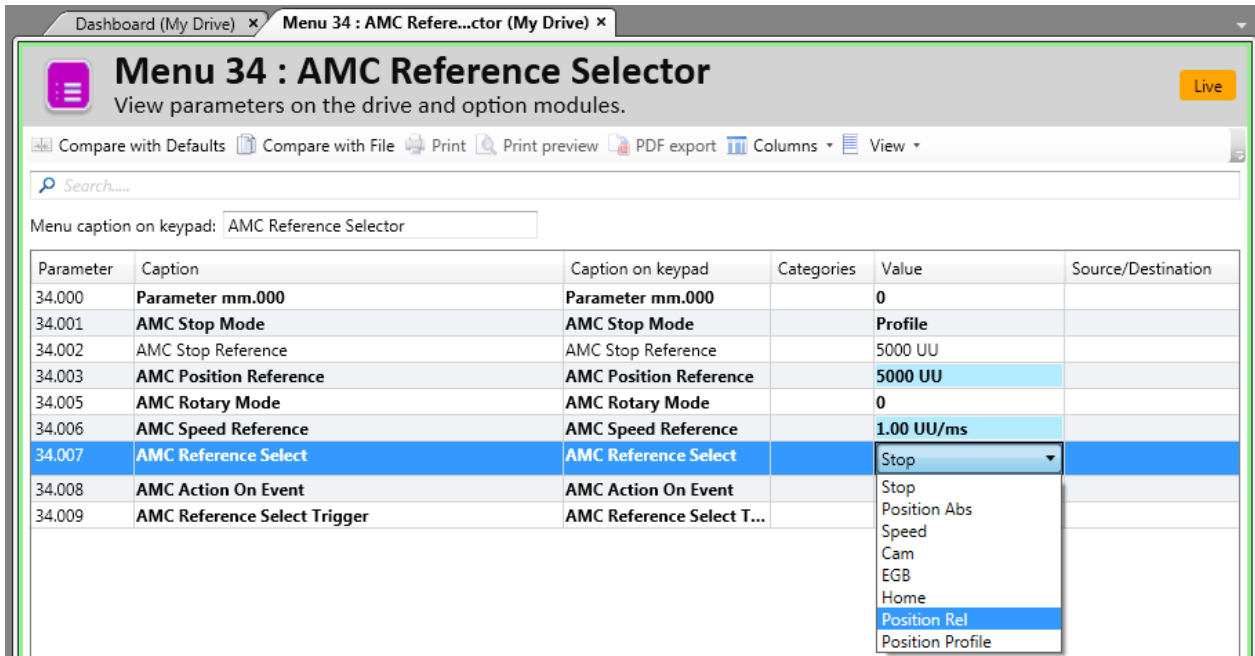
Search...

Menu caption on keypad: AMC Reference Selector

Parameter	Caption	Caption on keypad	Categories	Value	Source/Destination
34.000	Parameter mm.000	Parameter mm.000		0	
34.001	AMC Stop Mode	AMC Stop Mode		Profile	
34.002	AMC Stop Reference	AMC Stop Reference		359403 UU	
34.003	AMC Position Reference	AMC Position Reference		0 UU	
34.005	AMC Rotary Mode	AMC Rotary Mode		0	
34.006	AMC Speed Reference	AMC Speed Reference		1.00 UU/ms	
34.007	AMC Reference Select	AMC Reference Select		Stop	
34.008	AMC Action On Event	AMC Action On Event		Stop	
34.009	AMC Reference Select Trigger	AMC Reference Select T...		Position Abs	

Dropdown menu for 34.007 Value: Stop, Position Abs, Speed, Cam, EGB, Home, Position Rel, Position Profile

To perform an incremental index, first make sure Pr 34.007 = 'Stop'. Enter 5000 into Pr 34.003 then change Pr 34.007 from 'Stop' to 'Position Rel' and the motor will turn 5.000 revolutions and stop. Cycle Pr 34.007 back to 'Stop' then back to 'Position Rel', and the motor will turn another 5.000 revolutions. Another thing to try is to change Pr 34.007 to 'Position Abs'; what happens? After the motor has stopped what happens if you change AMC Position Reference Pr 34.003 to 0 while leaving Pr 34.007 = 'Position Abs'?



Dashboard (My Drive) x Menu 34 : AMC Refere...ctor (My Drive) x

Menu 34 : AMC Reference Selector Live

View parameters on the drive and option modules.

Compare with Defaults Compare with File Print Print preview PDF export Columns View

Search...

Menu caption on keypad: AMC Reference Selector

Parameter	Caption	Caption on keypad	Categories	Value	Source/Destination
34.000	Parameter mm.000	Parameter mm.000		0	
34.001	AMC Stop Mode	AMC Stop Mode		Profile	
34.002	AMC Stop Reference	AMC Stop Reference		5000 UU	
34.003	AMC Position Reference	AMC Position Reference		5000 UU	
34.005	AMC Rotary Mode	AMC Rotary Mode		0	
34.006	AMC Speed Reference	AMC Speed Reference		1.00 UU/ms	
34.007	AMC Reference Select	AMC Reference Select		Stop	
34.008	AMC Action On Event	AMC Action On Event		Stop	
34.009	AMC Reference Select Trigger	AMC Reference Select T...		Position Abs	

Dropdown menu for 34.007: Stop, Position Abs, Speed, Cam, EGB, Home, Position Rel, Position Profile

The basic AMC setup above is a brief demonstration of just a few of the AMC functions with a very basic user unit setup. User Units setup can be simplified with the AMC User Units Calculator that is a tool available from Control Techniques. Please feel free to contact us at the telephone or email in the Resources section if you would like a copy of the AMC User Units spreadsheet emailed to you.

Resources: can be found on our website: www.controltechniques.com

For help contact techsupport.cta@mail.nidec.com, or call Technical Support at 952-995-8000, 24/7/365