This Application Note applies to the Unidrive M Drive Series

Using the Drives Control Word

This document shows how to control the drive from its control word. The drive's control word can start and stop the motor by sending a decimal number to the drive via communications. Once the drive is set up and can run the motor, establish communications that you plan to control the drive with. The control word will be used to start and stop the drive; the control word can also be used to select the analog input for speed reference or a preset speed. Set parameter 0.005 back to its default setting of AV (for M100-M400) or A1.A2 (for M600-M700) if you changed it while setting up the motor.

To utilize the control word:

Set Pr 6.040 to off (Turns off sequence latching)
Set Pr 6.043 to on (Enables the control word)
Pr 6.042 is the destination for a binary control word entered in a decimal format. Bit 7 always needs to be on.

Control Word Function Bitmap

Using this table create a binary number that includes the individual bits needed to be turned on.

Bit	Function	Equivalent parameter
0	Drive enable	Pr 6.015
1	Run forward	Pr 6.030
2	Jog	Pr 6.031
3	Run reverse	Pr 6.032
4	Forward/reverse	Pr 6.033
5	Run	Pr 6.034
6	Not stop	Pr 6.039
7	Auto/manual	
8	Analog/Preset reference	
9	Jog reverse	Pr 6.037
10	Reserved	
11	Reserved	
12	Trip drive	
13	Reset drive	Pr 10.033
14	Keypad watchdog	

Disable Drive

Set the binary value of 10000000 in Pr 6.042, which is equivalent to only bit 7 being turned on.

Enable Drive with no run command

Set the binary value of 10000001 in Pr 6.042, which is equivalent to only bit 7 and bit 0 being turned on.

Enable Drive with Run Command sourced by an Analog speed reference

Set the binary value of 10000011 in Pr 6.042, which is equivalent to bit 7, bit 1, and bit 0 being turned on. Bit 8 has a default of 0, which sets the drive to analog reference mode.

Enable Drive with Run Command sourced by a Preset speed reference

Set the binary value of 110000011 in Pr 6.042, which is equivalent to bit 8, bit 7, bit 1, and bit 0 being turned on. The speed reference is stored in Pr. 1.21 (or 18 in the SK)

Change from run forward to run reverse sourced by an Analog Reference

The examples above have been looking at is using bit 1, which is run forward. To change directions, use bit 5 along with bit 4. To run reverse, write the binary value of 10110001 in Pr 6.042, which is equivalent to bit 7, bit 5, bit 4, and bit 0 being turned on. To run forward, write the binary value of 10100001 in Pr 6.042, which is equivalent to bit 7, bit 5, bit 4, and bit 0 being turned on.

Change from run forward to run reverse sourced by a Preset Reference

To run reverse, write the binary value of 110110001 in Pr 6.042, which is equivalent to bit 8, bit 7, bit 5, bit 4 and bit 0 being turned on. To run forward, write the binary value of 110100001 in Pr 6.042, which is equivalent to bit 8, bit 7, bit 5, and bit 0 being turned on.

Here is some additional info on the bits we are using in the control word:

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Bits 0-7 and bit 9: Sequencer control When Auto/manual bit (bit7) = 1 then bits 0 to 6 and bit 9 of the *Control Word* (06.042) become active. The equivalent parameters are not modified by these bits, but become inactive when the equivalent bits in the *Control Word* (06.042) are active. When the bits are active they replace the functions of the equivalent parameters.

Bit 8: Analogue/preset reference The state of Analogue/Preset Reference (bit 8) is written continuously to *Reference Select Flag 2* (01.042). With default drive settings (i.e. *Reference Selector* (01.014) = 0) this selects *Analog Reference 1* (01.036) when bit 8 = 0 or *Preset Reference 1* (01.021) when bit8 = 1. If any other drive parameters are routed to *Reference Select Flag 2* (01.042) the value of this parameter is undefined.

Bit 10 and bit 11: Not used The values of these bits have no effect on the drive.

Bit 12: Trip drive If bit 12 = 1 then a *Control Word* trip is repeatedly initiated. The trip cannot be cleared until bit 12 = 0.

Bit 13: Reset drive If bit 13 is changed from 0 to 1 a drive reset is initiated. Bit 13 does not modify *Drive Reset* (10.033).

Bit 14: Watchdog A watchdog system can be enabled or serviced each time bit 14 is changed from 0 to 1. Once bit 14 has been changed from 0 to 1 to enable the watchdog, this must be repeated every 1s or else a *Watchdog* trip will be initiated. The watchdog is disabled when the trip occurs and must be re-enabled if required when the trip is reset.

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

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