The Application Note is pertinent to the Quantum III / Mentor II Family

Timed Starting Current

Background

On some applications it is often necessary to allow the motor to deliver a high starting torque to get the load moving or break it away from static friction. However, once this starting current demand is delivered, which typically only lasts a few seconds, it is desirable to reduce the allowable current that the motor might demand thenceafter to a much lower level to prevent motor damage in the case of a machine/material jam. The Quantum III and Mentor II Drives have a built-in facility to provide just such a function—namely Timed Starting Current. This application note will discuss how to achieve this functionality.

Discussion

The key to activating this built-in feature is to examine the Menu 4 Flow Diagram (see pg 2) and the block diagram fragment below.

There are 2 current limit settings—namely I-Limit #1 and I-Limit #2. Setting parameter #4.18 to a 1 will activate this automatic changeover feature. When the Drive sees a RUN command, the value in I-Limit #1 is passed thru to the Overriding Current Limit register #4.03 for the time duration defined by parameter #4.19.

Upon expiration of that time (in seconds), the value in I-Limit #2 is then passed thru to the Overriding Current Limit register #4.03. A smaller value in #4.03 will override a larger value in #4.05 and #4.06—the basic Drive Current Limits (see next page).

Note: Both switches shown in starting state. They switch to position 1 after the time in #4.19.
In the example below, the value of 1000 in #4.04 represents the absolute maximum current that the drive can deliver to the motor. Typically the drive is scaled such that 150% of the motor nameplate current is able to be delivered when the current limit values #4.05/#4.06 is set to 1000 (the example shown below was for a non-regenerative model that does not have reverse SCR bridge—therefore #4.06=0).

Also from the above example, if 1000 represents 150% then 666/1000 = 100% (2/3 of 150%). Again it should be noted that these scaling numbers can be manipulated by the Application Engineer to get any desired scaling. For example, with a larger Drive, the drive could deliver 200% or more current for the desired start/breakaway requirements then fall back to a lesser amount after the set duration.
Also in the example above, the changeover from 150% to 100% current will occur after 10 seconds as set by parameter #4.19.

Questions ?? Ask the Author:

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