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Configuring the Start and Stop Modes

Description

This document serves as a supplement to the PowerFlex 700S Users Manual (20D-UM001x) addressing items specific to the PowerFlex 700S start and stop modes.

Technical Information

The start and stop mode refers to how you want the drive's start and stop to be controlled. There are 2 basic modes of start and stop control: 3 wire and 2 wire.

3 wire control indicates that the start and stop are momentary inputs. 3 wire control also indicates that there is one input for the start command, and one input for the stop command. The term "3 wire" comes from the fact that when using this type of control with digital inputs, 1 wire is used for the start input, 1 wire is used for the stop input, and 1 wire is used for the common.

2 wire control indicates that the start and stop are combined as 1 maintained input. The input must be on to start and to remain running. Then the same input is turned off to stop. The term "2 wire" comes from the fact then when using this type of control with digital inputs, 1 wire is used for the combined start/stop input, and 1 wire is used for the common.

For the stop command, there are 3 different types of stopping that can be performed: coast stop, ramp stop, and current limit stop.

1. Coast Stop – when in coast stop, the drive acknowledges the stop command by shutting off the output transistors and releasing control of the motor. The load/motor will coast or free spin until the mechanical energy is dissipated.
2. Ramp Stop – when in ramp to stop, the drive acknowledges the stop command by ramping down the motor speed reference using the programmed [Decel Time], maintaining control of the motor until the drive output reaches zero. The output transistors are then shut off.
3. Current Limit Stop – when in current limit stop, the drive acknowledges the stop command by setting the motor speed reference to zero, causing the drive to bring the motor down to zero speed as fast as the power limits, torque limits and current limits will allow. When the drive output reaches zero, the output transistors are shut off.

When different stop types are commanded at the same time, the priority from highest priority to lowest is coast stop, current limit stop, and then ramp stop.

The remainder of this section informs the user how to configure the drive for the different start and stop modes.

Configuring the Start and Stop for 3 Wire Control (Momentary Start and Stop)

To configure the drive for 3 wire control with a ramp stop:

- P153 [Control Options] set bit 8 to on, set bits 3 and 9 off.
- To control from digital inputs:
 1. Set P839 [DigIn2 Sel] = 1 "Normal Stop" or = 5 "Stop-CF". "Stop-CF" indicates that the same digital input is used as a stop and a clear fault.
 2. Set P840 [DigIn3 Sel] = 2 "Start"
- To control from a communication network:



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1. Toggle bit 0 “Normal Stop” in the logic command word on and then off to perform a ramp stop.
2. Toggle bit 1 “Start” in the logic command word on and then off to perform a start.

To configure the drive for 3 wire control with a coast stop:

- P153 [Control Options] set bit 8 on, set bits 3 and 9 off.
- To control from digital inputs:
 1. Set P839 [DigIn2 Sel] = 10 “Coast Stop”
 2. Set P840 [DigIn3 Sel] = 2 “Start”
- To control from a communication network:
 1. Toggle bit 9 “Coast Stop” in the logic command word on and then off to perform a coast stop.
 2. Toggle bit 1 “Start” in the logic command word on and then off to perform a start.

To configure the drive for 3 wire control with a current limit stop:

- P153 [Control Options] set bit 8 on, and set bits 3 and 9 off.
- To control from digital inputs:
 1. Set P839 [DigIn2 Sel] = 9 “Current Limit Stop”
 2. Set P840 [DigIn3 Sel] = 2 “Start”
- To control from a communication network:
 1. Toggle bit 8 “CurrLim Stop” in the logic command word on and then off to perform a current limit stop.
 2. Toggle bit 1 “Start” in the logic command word on and then off to perform a start.

Note: In 3 wire mode, all stops commanded from pressing the HIM stop button are ramp stops.

Configuring the Start and Stop for 2 Wire Control (Maintained Start and Stop)

To configure the drive for 2 wire control with a ramp stop:

- P153 [Control Options] set bits 3, 8 and 9 off.
- To control from digital inputs:
 1. Set P839 [DigIn2 Sel] = 3 “Run”
- To control from a communication network:
 1. Set bit 1 “Start” in the logic command word on to run and set bit 1 “Start” off to perform a ramp stop.
- To control from the HIM:
 1. Hold down the start button to run and release the start button to perform a ramp stop.

To configure the drive for 2 wire control with a coast stop:

- P153 [Control Options] set bit 9 on, set bits 3 and 8 off.
- To control from digital inputs:
 1. Set P839 [DigIn2 Sel] = 3 “Run”
- To control from a communication network:
 1. Set bit 1 “Start” in the logic command word on to run and set bit 1 “Start” off to perform a coast stop.
- To control from the HIM:
 1. Hold down the start button to run and release the start button to perform a coast stop.



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Note: When P153 [Control Options] bit 9 is on, and bits 3 and 8 are off all other stop commands become coast stops because of the priority of the stop types. For example, if you try to command a ramp stop or current limit stop from a communication network, the drive will still perform a coast stop.

To configure the drive for 2 wire control with a current limit stop:

- P153 [Control Options] set bit 3 on, set bits 8 and 9 off.
- To control from digital inputs:
 1. Set P839 [DigIn2 Sel] = 3 “Run”
- To control from a communication network:
 1. Set bit 1 “Start” in the logic command word on to run and set bit 1 “Start” off to perform a current limit stop.
- To control from the HIM:
 1. Hold down the start button to run and release the start button to perform a current limit stop.

Note: When P153 [Control Options] bit 3 is on, and bits 8 and 9 are off the ramp (normal) stop becomes a current limit stop. For example, if you try to command a ramp stop from a communication network, the drive will still perform a current limit stop. A coast stop can still be performed by commanding a coast stop.