

PowerFlex 520-Series Control and Power Module Compatibility

Objective

This white paper demonstrates the procedure by which you can quickly and efficiently configure a PowerFlex 520-Series Control Module to accommodate a new Power Module.

Introduction

Rockwell Automation's innovative PowerFlex® 520-Series Drive Control Module provides a convenient solution for configuring replacement Power Modules. The ease of unplugging the Control Module from one Power Module and plugging it into another allows our customers to effortlessly replace drives without the inconvenience of reconfiguring a new Control Module from scratch. For example, if you have a PowerFlex 523 drive with a power rating of 1HP that operates on 480V, you can conveniently take the Control Module of that drive, place it onto any other PF520-Series Power Module, configure the drive to accept the changes and within minutes you will have a new drive ready to fulfill your application needs.

Control and Power Module Compatibility

After the drive has been flashed with the latest firmware or if new parameters have been downloaded to a drive using a MainsFree Programming (USB), there are (2) possible situations when replacing the Control Module on the Power Module and they are as follows:

- 1) The Control Module's power configurations are the **same** as the Power Module's rating
- 2) The Control Module and Power Module have a **different** power rating and/or voltage configurations

For instructions on how to upload, download or flash firmware, refer to the "*PowerFlex 525 – USB Application*" Application Note.

The next sections will demonstrate how to configure the Control and Power Modules.

Control and Power Module Configuration

Units with **Same** Power Rating and Voltage Configurations

If the Control Module and the Power Module have the **same** power rating and voltage configurations, connecting the Control and Power Module will yield no faults or notifications. In this situation, simply place the Control Module on the Power Module and continue operating the drive.

Units with **Different** Power Rating and/or Voltage Configuration

IMPORTANT: Please ensure that the parameters downloaded to the Control Module are correct for the drive application.

In the event that the Control and the Power Module have a **different** power rating and/or voltage configurations, the fault “**F109 – Mismatch C-P**” will appear and the fault LED light will flash as shown in the picture below.

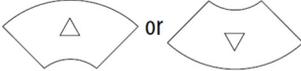
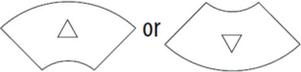


The Control and Power Module are now ready to be configured for compatibility and the fault can be cleared.

IMPORTANT: Please ensure that the Control and Power Module are properly connected

Step	Key	Example Display
<p>1. The drive will flash the “F109 – Mismatch C-P” fault. Press Esc to display the default screen (Example shows the value of b001 [Output Freq]).</p>		

Application Note

<p>2. Press Sel to enter the parameter group list. The parameter group letter will flash.</p>		
<p>3. Press the Up Arrow or Down Arrow to scroll through the parameter list and select "P053".</p>		
<p>4. Press Enter to view the value of the parameter.</p>		
<p>5. Press the Up Arrow or Down Arrow to change the parameter option to 3. This will reset only the power parameters.</p> <p>Note: Refer to the next section for a list of the parameters that will be reset with option 3 (Power Reset).</p>		
<p>6. The fault LED light will blink and display "F048 – Params Defaulted" fault on the screen. This fault indicates that the power parameters are reset to its default values.</p>		
<p>7. Pressing the stop button or cycle power to the drive to clear the "F048" fault.</p>		
<p>8. The Control and Power Module are now configured with identical power rating and voltage configurations. The drive is now ready for use.</p>		

Note: Option 3 in Parameter P053 can be configured using Studio 5000, Connected Components Workbench or external HIM.

Parameters Set to Default Values

IMPORTANT: Stop Drive before changing parameter “P053 [Reset to Defaults]”

Parameter P053 resets the parameters to their default values based on the option selected (i.e. option 1, 2 or 3). After a reset command, the value of this parameter returns to zero.

In Step 5 shown above, option 3 is “Power Reset” and this selection resets **ONLY** the following (18) parameters. The number of parameters that need to be changed from the default values depends on the drive application.

Parameters that are Reset when P053 = 3

Parameter Name
P031 [Motor NP Volts]
P033 [Motor OL] Current
P034 [Motor NP FLA]
P035 [Motor NP Poles]
P038 [Voltage Class]
A435 [DC Brake Level]
A484 [Current Limit 1]
A485 [Current Limit 2]
A486 [Shear Pin1 Level]
A488 [Shear Pin2 Level]
A490 [Load Loss Level]
A496 [IR Voltage Drop]
A497 [Flux Current Ref]
A530 [Boost Select]
A531 [Start Boost]
A532 [Break Voltage]
A533 [Break Frequency]
A534 [Maximum] Voltage

For additional information on parameter P053, refer to the [PowerFlex 520-Series User manual](#).

Compatibility Note for PowerFlex 525

The PowerFlex 525 Control Modules do not support Power Modules with 0.25 HP power rating. In the event that a PowerFlex 525 Control Module is connected to a 0.25HP Power Module, the screen will display fault “**F106 – Incomp C-P**”. This notification indicates that the PowerFlex 525 Control Module and the connected Power Module are not compatible. The following should be done in order to clear the fault:

- Connect to a different Power Module with a power rating over 0.25HP
- Use a PowerFlex 523 Control Module to sustain compatibility with 0.25HP power rating

Hardware Anomaly

In the rare event that an inconsistency in the hardware functionality occurs, the Control Module screen will display fault “**F107 – Replaced C-P**”. This notification indicates that the Control Module could not recognize the Power Module and a hardware malfunction has occurred. The following should be done in order to clear the fault:

- Connect to a different Power Module
- Replace the Control Module if connecting to a different power Module does not work
- If replacing the Control and Power Module does not work, contact your local distributor or Rockwell Automation representative, or visit <http://www.rockwellautomation.com/support/>.

Potential Situation for PowerFlex 523

	Connected to...	Frame	Power	Voltage	What would happen?	How can it be fixed?
PowerFlex 523 Control Module 25A-B5P0N104 Power Rating: 1HP Voltage: 200-240V	A new PowerFlex 523 Power Module	A	1HP	200-240V	No fault after power up	No action
		A	0.25HP	200-240V	F109	Step 1: Set P053 = 3 (18 power related parameters reset to default) Step 2: If changes needed, reconfigure affected parameters
		A	0.5HP	200-240V		
		A	0.5HP	380-480V		
		B	5HP	380-480V		
	The original PowerFlex 523 Power Module	A	1HP	200-240V	No fault after power up	No action
	A new PowerFlex 525 Power Module	A	1HP	200-240V	No fault after power up	No action
		A	0.5HP	200-240V	F109	Step 1: Set P053 = 3 (18 power related parameters reset to default) Step 2: If changes needed, reconfigure affected parameters
		A	0.5HP	380-480V		
		B	5HP	380-480V		

Potential Situation for PowerFlex 525

	Connected to...	Frame	Power	Voltage	What would happen?	How can it be fixed?
PowerFlex 525 Control Module 25B-D4P0N104 Power Rating: 2HP Voltage: 380-480V	A new PowerFlex 523 Power Module	A	2HP	380-480V	No fault after power up	No action
		A	0.25HP	200-240V	F106	Option 1: Connect to a Power Module rated over 0.25HP OR Option 2: Connect to a PowerFlex 523 Control Module
		A	0.5HP	200-240V	F109	
		A	0.5HP	380-480V		
		B	5HP	380-480V		
	The original PowerFlex 525 Power Module	A	2HP	380-480V	No fault after power up	No action
	A new PowerFlex 525 Power Module	A	2HP	380-480V	No fault after power up	No action
		A	0.5HP	200-240V	F109	Step 1: Set P053 = 3 (18 power related parameters reset to default) Step 2: If changes needed, reconfigure affected parameters
		A	0.5HP	380-480V		
		B	5HP	380-480V		

Summary Flow Chart

This flow chart summarizes the notifications indicated by the drive and the suitable actions to take.

