

# Start-Up failure

→ A **Start-Up Failure** occurred during the **START** of the state machine

Convergence: the STO PLL speed has to be **N times** in the **range of the speed expected by the virtual speed sensor**. When the minimum speed is reached the convergence is checked to go out of the Start state in the **Time dedicated** for the Start-Up.

Drive Management - Start-up parameters

Sensor-less rev-up settings

On-the-Fly startup

Profile

Basic

Advanced customized

Initial electrical angle  deg

	Duration (ms)	Final speed (rpm)	Final current (A)
1)	1000	0	1.00
2)	1600	1600	1.60
3)	0	1600	1.60
4)	0	1600	1.60
5)	0	1600	1.60

Execute sensor-less algorithm starting from

Consecutive successful start-up output tests

Minimum start-up output speed  rpm

Estimated speed Band tolerance upper limit  %

Estimated speed Band tolerance lower limit  %

Rev-up to FOC switch-over

Enable

Duration  ms

Done

## • Reasons for Start-Up failure:

- The minimum start-up speed is too high
- The range of the comparison speed is too narrow
- The time for start-up is too short
- The final ramp of the start-up phase is too low
- The speed measured is not reliable (PLL)
- Too much load

# Start-Up failure

→ A **Start-Up Failure** occurred during the **SWITCH OVER** of the state machine

Closed loop: At the end of the **pre defined time** for the Switch Over state, the virtual speed sensor (VSS) has to be in the **reliability range**. The Switch Over state has to take place during the rev-up phases. When the loop is closed we go out of the Switch Over state and the rev-up is over.

Drive Management - Start-up parameters

Sensor-less rev-up settings

On-the-Fly startup

Profile

Basic

Advanced customized

Initial electrical angle: 0 deg

	Duration (ms)	Final speed (rpm)	Final current (A)
1)	1000	0	1.00
2)	1600	1600	1.60
3)	0	1600	1.60
4)	0	1600	1.60
5)	0	1600	1.60

Execute sensor-less algorithm starting from: 2

Consecutive succesful start-up output tests: 2

Minimum start-up output speed: 1440 rpm

Estimated speed Band tolerance upper limit: 106.25 %

Estimated speed Band tolerance lower limit: 93.75 %

Rev-up to FOC switch-over

Enable:

Duration: 25 ms

Speed (rpm) vs Duration (ms) graph: The graph shows speed (rpm) on the left y-axis (0 to 1500) and current (A) on the right y-axis (0.0 to 2.0) against duration (ms) on the x-axis (0 to 2000). A blue line shows speed increasing from 0 at 1000ms to 1600 rpm at 1600ms. A red line shows current increasing from 0 at 1000ms to 1.60 A at 1600ms.

Done

Motor - Parameters

Motor Sensors

Magnetic structure: Surface Mounted PMSM

Electrical parameters

Pole Pairs: 2

Max. Application Speed: 4000 rpm

Nominal Current: 1.60 Apk

- **Reasons for Start-Up failure:**

→ Switch Over duration is too high

→ Rev-up phases time is too short

→ VSS speed is not in the range of the authorized speed (0 to Max)

→ The minimum start-up speed is too high