

Application Note	AN-MEGA-0002-v100EN
Analogue set point and Analogue torque limit	

Inverter type	FRENIC MEGA
Software version	Any
Required options	OPC-G1-PG2
Related documentation	INR-SI47-1223-E
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Approved	David Bedford
Use	Public, Web
Date	20.05.08
Version	1.0.0
Languages	English

Introduction.

This document describes how FRENIC MEGA is used in speed control with analogue torque limiter. This application example describes FRENIC MEGA controlling a motor that moves the jaws (open and close) of a bag sealer in a packaging machine.

Implementation Idea.

FRENIC MEGA is able to perform torque vector control with Analogue set point and Analogue torque limit.

The Motor is controlled using feedback encoder (closed loop); therefore FRENIC MEGA is running in PG Vector Control. Speed Signal from the controller is given by Analogue set point (-10V to 10V), to terminal 12. A torque limit from the controller is given by Analogue set point (0 to 10V), to second voltage input V2.

The external controller is giving the speed set point and the torque limit, controlling the position (position control inside the controller) of the axis (motor).

The torque limit is controlled during the open-close cycle of the jaws, due to the fact that the value of the torque limit is reduced around the position where the jaws are closed.

Wiring diagram

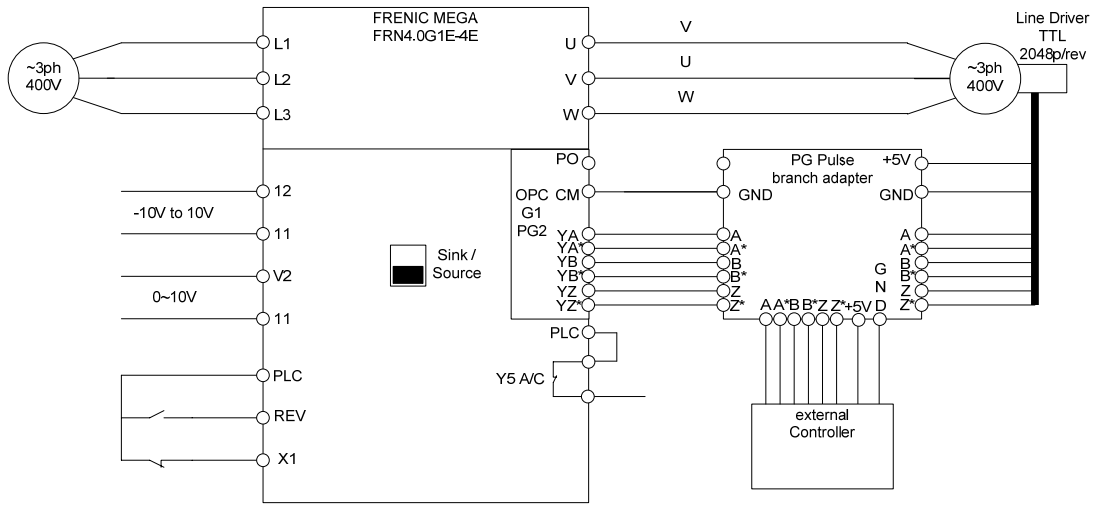


Figure 1 Connection set up diagram

Control signals used

Terminal	Description	Usage
12 / 11	[-10V to 10V]	Frequency Command 1
V2 / 11	[0 to 10V]	Analogue Torque Limiter
REV		Run Signal
X1		THR (External Fault)
Y5 A/C		No Alarm (Inverter okay)

Functions different from factory default

Function Code	Description	Setting	Comment
F01	Frequency Command 1	1	Via terminal [12] (-10V to +10V)
F02	Operation Method	1	Via digital inputs
F03	Maximum Frequency 1	50Hz	
F04	Base Frequency 1	53Hz	Rated Motor Data
F05	Rated Voltage at Base Frequency 1	330V	Rated Motor Data
F07	Acceleration time 1	0.00s	
F08	Deceleration time 1	0.00s	
F23	Starting Frequency1	0.0Hz	
F25	Stop Frequency	0.2Hz	
F26	Carrier Frequency	16kHz	
F42	Drive Control Selection 1	6	Vector Control with Speed Sensor
F43	Current Limiter	0	Disable
E01	Terminal [X1] Function	9	External Fault
E24	Terminal [Y5A/C]	1099	No Alarm
E63	Terminal [V2] Extended Function	7	Analogue Torque Limit Value A (driving)
C33	Analogue Input [12] Filter Time Constant	0.05s	
C35	Analogue Input [12] Polarity	0	
C42	Analogue Input [V2] Gain	30	Torque Limit of 60% at 10V
C43	Analogue Input [V2] Filter Time Constant	0.00s	
P01	Motor 1 Number of Poles	2	Rated Motor Data
P02	Motor 1 Rated Capacity	3.2 kW	Rated Motor Data
P03	Motor 1 Rated Current	7.0A	Rated Motor Data
D01	Speed Command Filter	0.000s	
D02	Speed Detection Filter	0.000s	
D03	ASR P Gain	20	
D04	ASR I Time	0.010s	
D06	ASR Output Filter	0.000s	
D15	Feedback Encoder Pulse Resolution	2048	Encoder Data
D24	Zero Speed Control	1	Enable from Start Up

Note: For PG Vector Control it is mandatory to perform the Auto Tuning P04 to 2.

Torque limit adjustment:

The torque limit is defined as 200% torque at 10V input and a Gain of 100%. To achieve 60% torque at 10V it is necessary to adjust the Gain C42.

Conclusion.

As described in this document, with FRENIC MEGA it is now possible to use speed control with analogue torque limiting. This functionality offers a full range of new applications which were not possible to solve using FRENIC 5000G11.

Document history.

Index	Version	Date	Applied by
1.0.0	First		Andreas Schader