e-Front runners
Fuji Electric FA Europe

APPLICATION NOTE	AN-MEGA-0003v102EN

UNBL gains with FRENIC MEGA using Customizable Logic

Inverter type	FRENIC MEGA
Software version	1000 and later
Required options	Not required
Related documentation	FRENIC MEGA User manual_MEH278a, FRENIC MEGA additional Instruction Manual_ INR-SI47-1359-E
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Languages	English

Introduction.

This document describes a special set up of FRENIC MEGA to have unbalanced load gains at start. This set up uses Customizable Logic (function codes UXX) to achieve this behavior. With this functionality FRENIC MEGA can avoid load Rollback during mechanical brake opening for vertical loads (hoists, lifts,…).

Description.

The principle of the idea is to use motor 2 parameters (only particular ones) to change the speed loop gains (second set of Proportional gain and Integral time) during brake opening. These gains will be higher than the gains used during normal operation.

The activation of the motor 2 parameters (second set of speed loop gains) is done by Customizable Logic. The idea is that these gains are active a short time after the brake opens. To do so the inverse logic of BRKS signal is used combined with an OFF delay timer: the second set of gains will be active a short time (this time can be set) after the brake opens. To ensure that these gains are active only during brake opening (at start), FWD and REV signals are also taken into account in the logic circuit. Figure 1 shows the diagram of the logic circuit.
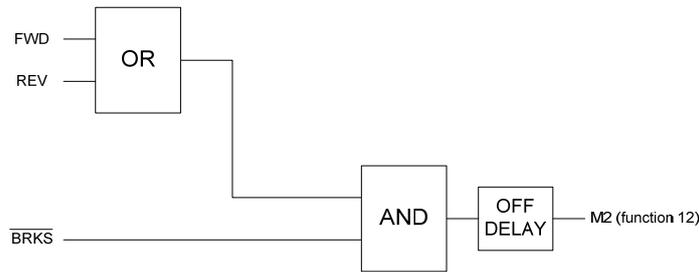
Figure 1. Logic circuit diagram.

Take into account that at the beginning of the movement the speed loop gains used will be the Motor 2 ones (A43 to A48), and after time defined on parameter U10 the speed loop gains used will be the Motor 1 ones (d01 to d06).

Motor 1	Motor 2	Description
d01	A43	Speed command filter
d02	A44	Speed detection filter
d03	A45	P gain
d04	A46	Integral time
d06	A48	Output filter

Another consideration, in order to ensure that the behavior of the motor is correct, is that some additional parameters (apart from the speed loop gains) are used when motor 2 is selected, as listed in the table below. These parameters have to be equal in both motors, or can be adjusted separately if some differences are desired depending on the motor selected.

Motor 1	Motor 2	Description
F37	A13	Load Selection / Auto torque boost / etc.
P09	A23	Slip compensation gain for driving
P10	A24	Slip compensation response time
P11	A25	Slip compensation gain for braking
H68	A40	Slip compensation (operating conditions)
H80	A41	Output current fluctuation damping gain for motor

If any of the parameters listed in the table above is not modified and any special behavior is not desired, then the ones of group AXX do not need to be modified because the default values are the same for both motor parameters.

Inverter function set up.

The following table shows the inverter set up from default settings

Function	Value	Description
A42	1	Only particular codes of motor 2 are switched
U00	1	Enable Customizable Logic
U01	4010	Terminal [FWD] as input signal of step 1
U02	4011	Terminal [REV] as input signal of step 1
U03	3	OR + General-purpose timer for step 1
U06	2001	Output of step 1 as input signal of step 2
U07	1057	Inverse of BRKS as input signal of step 2
U08	2	AND + General-purpose timer for step 2
U09	2	OFF-delay timer for step 2
U10	0.5 s	Time for the OFF-delay timer of step 2. The value depends on the mechanical brake opening time
U71	2	Customizable Logic output signal 1 comes from step 2 output
U81	12	Customizable Logic output signal 1 controls the selection signal for motor 2 (M2 function)

Document history.

Version	Changes applied	Date	Written	Checked	Approved
1.0.0	First version	02/03/2009	D. Bedford	J. Català	
1.0.1	Second version. Small spelling changes. Added a list of parameters that must be equal or adjusted separately	02/03/2009	J. Català		
1.0.2	Small corrections. Tables added.	02/03/2009	D. Bedford	J. Català	D.Bedford