

Related Products: SGLGW, SGLFW, SGLTW, SigmaTrac, SigmaWin+ 5.62 or later

Sigma-5 Linear Motor Polarity Detection

Question:

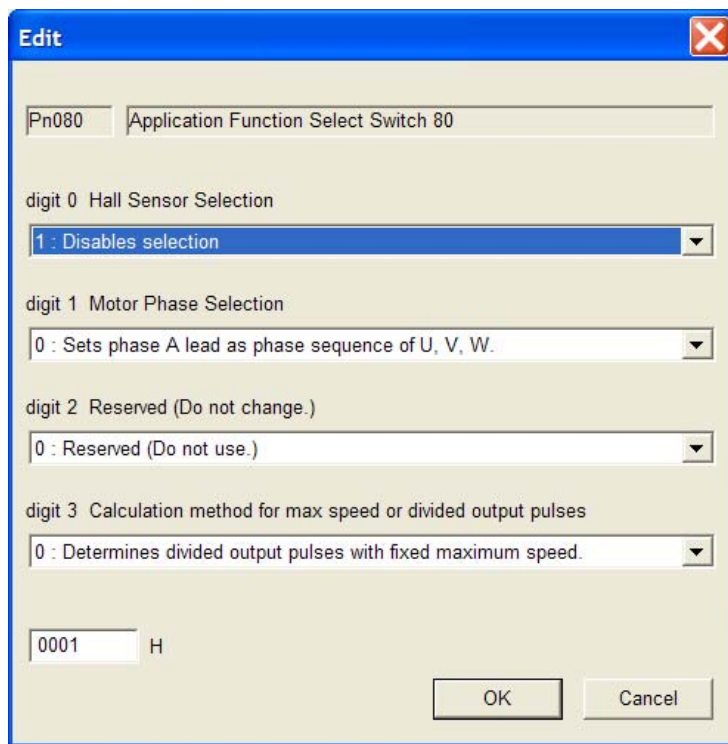
How do I run a Yaskawa linear motor without hall sensors?

Answer:

This FAQ describes the required amplifier parameters settings for enabling and operating the polarity detection feature for hall-less operation of Sigma-5 linear motor systems. The polarity detection function detects the magnetic polarity and stores the phase data in the ServoPack relative to the linear scale. This detection routine is initiated automatically the first time a ServoON command is received from the host controller after initial power up of the servo system.

Note: The use of hall-less startup commutation of linear motors is only recommended for horizontally mounted systems with allowable clearance during the startup period.

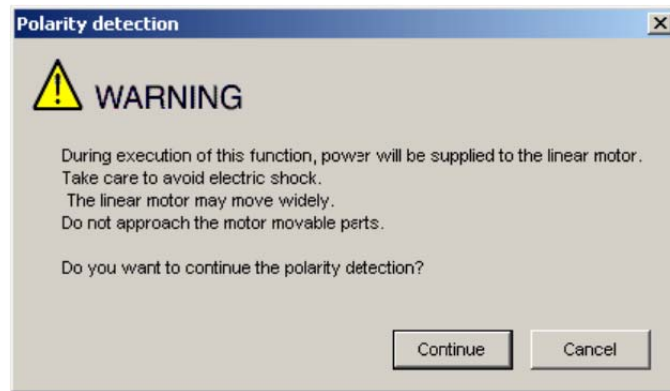
For linear motor operation without hall sensors, the amplifier system must be configured to disable the Hall Sensor Selection with Pn080.0



Once the Hall sensor selection has been disabled, and the amplifier reset, the default polarity detection parameters should be tested using the “Polarity Detection” function under the “Setup” menu in SigmaWin+ software.

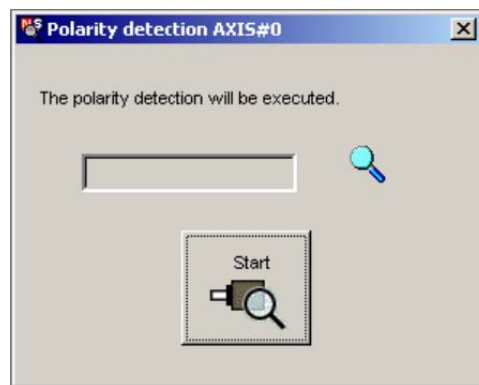
Note: During the Polarity Detection routine, the linear motor will move between at least two magnetic phases of the magnet track in search of the correct phasing. Care must be taken to insure that there is ample clearance for this operation to complete successfully.

1. In the SigmaWin+ Σ -V component main window, click **Setup** and then **Polarity Detection**. A warning message appears, reminding you of the possible dangers.



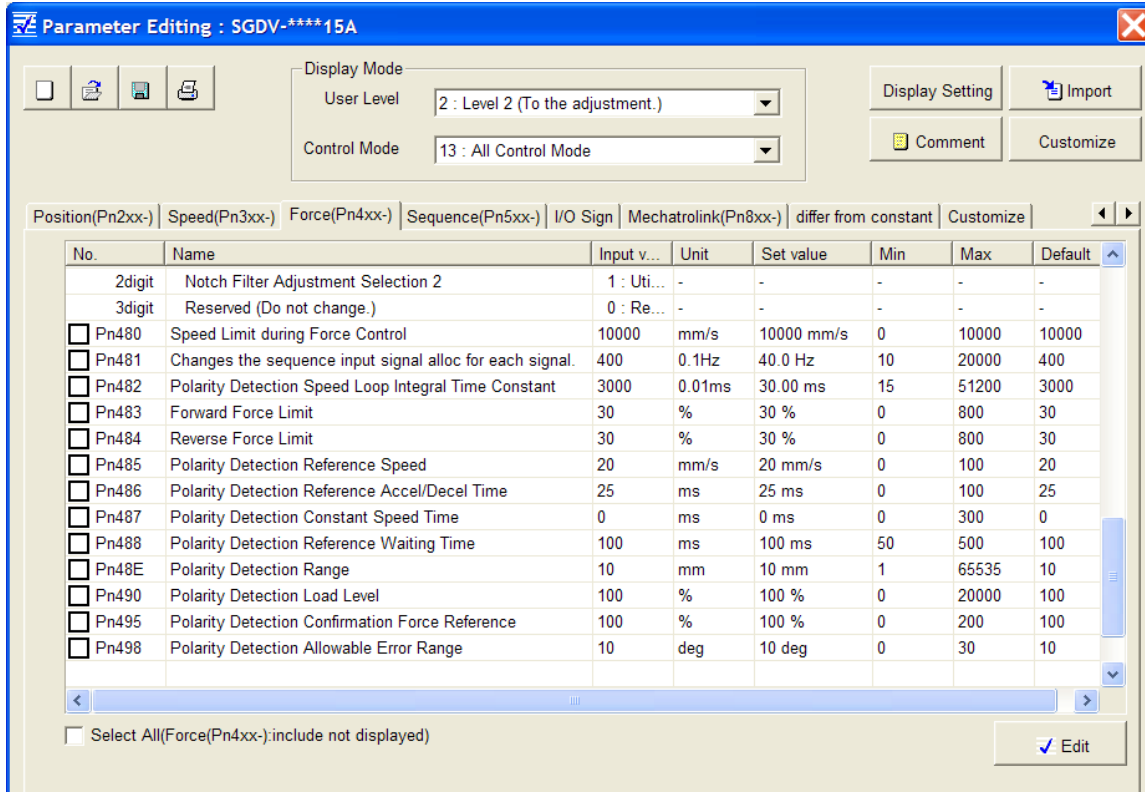
Click **Cancel** to return to the main window without executing the polarity detection function.

2. Click **Continue**, and the Polarity Detection box appears.



3. Click **Start**, and the polarity detection will be executed.

If the initial test, fails to complete, then the detection routing parameters can be adjusted for various loading conditions. The Polarity detection settings are listed in the Force (Pn4xx) parameter tab within SigmaWin+ below.



Parameter Editing : SGDV-****15A

Display Mode: User Level: 2 : Level 2 (To the adjustment.) Control Mode: 13 : All Control Mode

Position(Pn2xx-) | Speed(Pn3xx-) | **Force(Pn4xx-)** | Sequence(Pn5xx-) | I/O Sign | Mechatrolink(Pn8xx-) | differ from constant | Customize

No.	Name	Input v...	Unit	Set value	Min	Max	Default
2digit	Notch Filter Adjustment Selection 2	1 : Uti...	-	-	-	-	-
3digit	Reserved (Do not change.)	0 : Re...	-	-	-	-	-
<input type="checkbox"/> Pn480	Speed Limit during Force Control	10000	mm/s	10000 mm/s	0	10000	10000
<input type="checkbox"/> Pn481	Changes the sequence input signal alloc for each signal.	400	0.1Hz	40.0 Hz	10	20000	400
<input type="checkbox"/> Pn482	Polarity Detection Speed Loop Integral Time Constant	3000	0.01ms	30.00 ms	15	51200	3000
<input type="checkbox"/> Pn483	Forward Force Limit	30	%	30 %	0	800	30
<input type="checkbox"/> Pn484	Reverse Force Limit	30	%	30 %	0	800	30
<input type="checkbox"/> Pn485	Polarity Detection Reference Speed	20	mm/s	20 mm/s	0	100	20
<input type="checkbox"/> Pn486	Polarity Detection Reference Accel/Decel Time	25	ms	25 ms	0	100	25
<input type="checkbox"/> Pn487	Polarity Detection Constant Speed Time	0	ms	0 ms	0	300	0
<input type="checkbox"/> Pn488	Polarity Detection Reference Waiting Time	100	ms	100 ms	50	500	100
<input type="checkbox"/> Pn48E	Polarity Detection Range	10	mm	10 mm	1	65535	10
<input type="checkbox"/> Pn490	Polarity Detection Load Level	100	%	100 %	0	20000	100
<input type="checkbox"/> Pn495	Polarity Detection Confirmation Force Reference	100	%	100 %	0	200	100
<input type="checkbox"/> Pn498	Polarity Detection Allowable Error Range	10	deg	10 deg	0	30	10

Select All(Force(Pn4xx-):include not displayed) Edit