

## Title: Mitutoyo ST1300 Set-up Guide

**Product(s):** Sigma-5, Sigma-7, SigmaWin+ ver. 7, SigmaTrac, SGL Series Linear Motors

**DOC. NO.** AN.MTN.15

Follow the steps below to get the linear motor up and running with the Mitutoyo ST1300 absolute encoder. The process below requires use of SigmaWin+ ver. 7 which can be downloaded from [yaskawa.com](http://yaskawa.com). Below is a system diagram depicting the layout of the encoder head, encoder cables, and amplifier.



The encoder cable that connects the Mitutoyo ST1300 encoder to the Yaskawa SERVOPACK must first be created by the user. The following components are needed to make this cable:

1. Connector: 17JE-15H-1A-CF (DDK)



3. 2x Nut: 17L-002C (DDK)



2. Shell: 17JE-13150-02(D1)A (DDK)



4. \*Yaskawa Flexible Encoder Cable: JZSP-CMP10-XX-E (where XX denotes length in meters: 03, 05, 10, 15, 20)



\*Other encoder cable option: Yaskawa Flexible Raw Encoder Cable: JZSP-CSP29-XX-E & Yaskawa SERVOPACK Connector Kit JZSP-CMP9-1-E

## Title: Mitutoyo ST1300 Set-up Guide

**Product(s):** Sigma-5, Sigma-7, SigmaWin+ ver. 7, SigmaTrac, SGL Series Linear Motors

**DOC. NO.** AN.MTN.15

Using the pin-out provided in the Mitutoyo ABS ST1300 Series Installation Manual and in the Yaskawa Sigma 7 Technical Supplement, the female end of the JZSP-CMP10-XX-E encoder cable will be replaced by the connector and shell depicted above.

**Table 6-5 Pin assignment for YASKAWA Electric Corporation  $\Sigma$  Series**

Pin No.	Signal	Pin No.	Signal
1, 2	GND	10	N.C.
3, 4	VCC	11	VCC
5	N.C.	12	N.C.
6	N.C.	13	GND
7	S	14	N.C.
8	/S	15	F.G
9	N.C.	Connector shell	F.G

**Yaskawa Encoder Pin-Out**

Pin	Signal	Function
1	PG5 V	Encoder power supply +5 V
2	PG0 V	Encoder power supply 0 V
3	-	-
4	-	-
5	PS	Serial data
6	/PS	
Shell	Shield	

**Note:** Only one of pins 1, 2, or 13 needs to be wired to pin 2 of the encoder connector. The same is true for pins 3, 4 and 11 wiring to pin 1 of the encoder connector. Therefore, only 4 connections need to be made as well as ensuring that the shield is ground to the connector shell.

Once all cabling is correct, proceed to the following guide to set-up the encoder.

## Title: Mitutoyo ST1300 Set-up Guide

Product(s): Sigma-5, Sigma-7, SigmaWin+ ver. 7,  
SigmaTrac, SGL Series Linear Motors

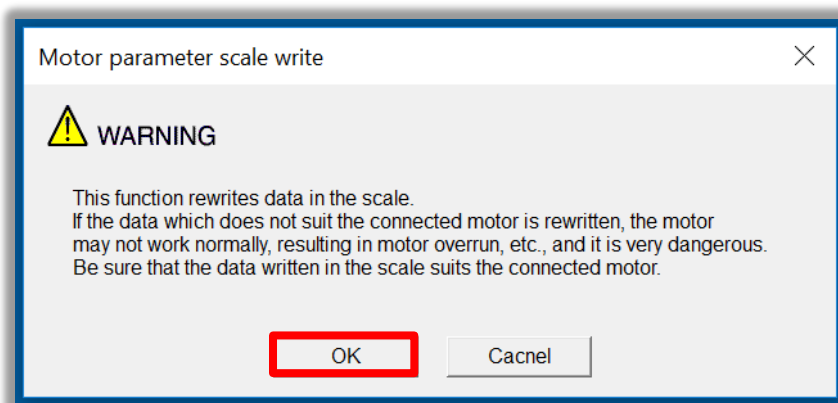
DOC. NO. AN.MTN.15

### SigmaWin+ ver. 7

1. When the encoder is powered and installed properly, the LED indicators on the connector should light up in orange and red, then they should shut off after a few seconds. If not, reference the Mitutoyo ABS ST1300 Series Installation Manual for troubleshooting information.



2. Once SigmaWin+ is up and running and is connected to the amplifier, import the correct motor parameter file by selecting “Motor parameter scale write” under the “Encoder Setting” menu. Select “OK”.

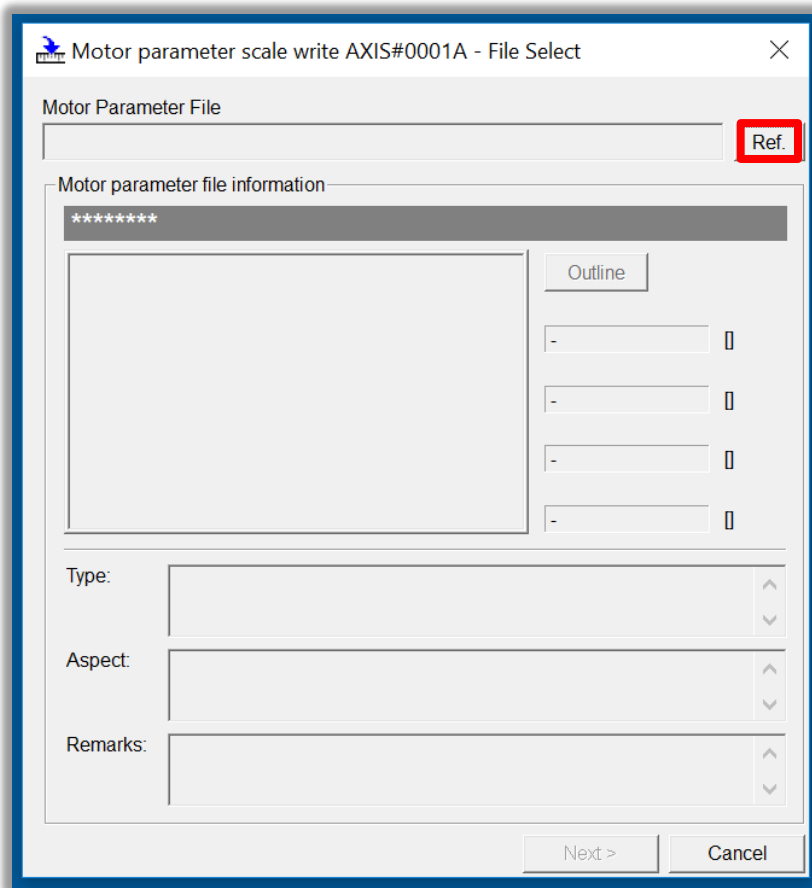


**Title:** Mitutoyo ST1300 Set-up Guide

**Product(s):** Sigma-5, Sigma-7, SigmaWin+ ver. 7,  
SigmaTrac, SGL Series Linear Motors

DOC. NO. AN.MTN.15

- a. Click the “Ref.” button, then select the appropriate .mcf file to import based on the connected motor.

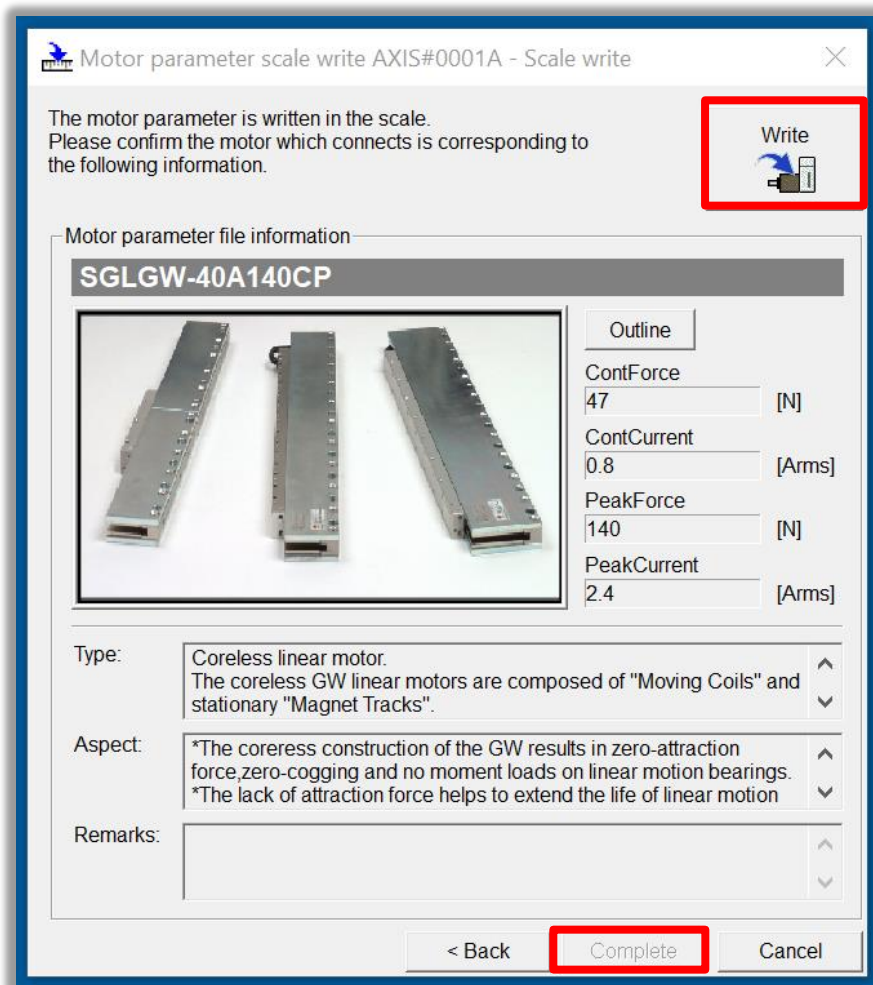


**Title:** Mitutoyo ST1300 Set-up Guide

**Product(s):** Sigma-5, Sigma-7, SigmaWin+ ver. 7, SigmaTrac, SGL Series Linear Motors

DOC. NO. AN.MTN.15

- b. Click the “Write” button, Click “Yes” in the Scale write pop-up window, then click the “Complete” button once the parameter write is completed.



- c. Cycle power to the SERVOPACK.
3. Since this encoder does not use hall sensors, change parameter Pn080.0 selection to “1: Disables selection” and write the parameter to the SERVOPACK.

Pn080.0	Hall Sensor Selection	—	1 : Disables selection
---------	-----------------------	---	------------------------

**Title:** Mitutoyo ST1300 Set-up Guide

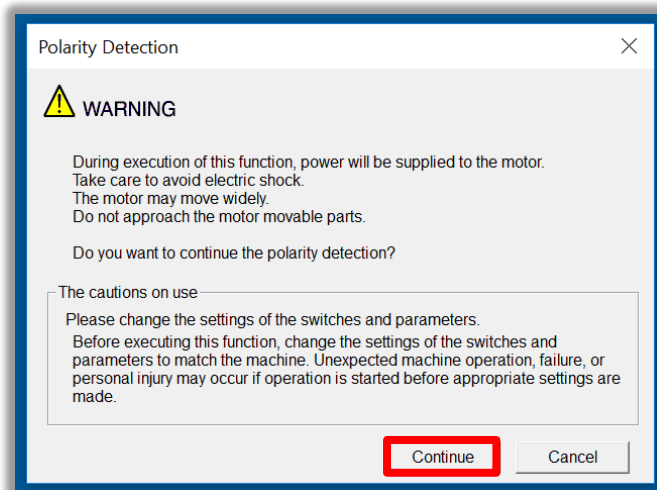
**Product(s):** Sigma-5, Sigma-7, SigmaWin+ ver. 7, SigmaTrac, SGL Series Linear Motors

**DOC. NO.** AN.MTN.15

- a. Cycle power to the SERVOPACK or perform software reset.
  - b. If after this step an A.041 alarm occurs, reference the Troubleshooting Appendix at the end of this document. Pn281 is application specific was changed from 20 (default) to 1 to bypass the alarm. For applications, set Pn281 according to the application requirements.
4. Linear encoder pitch should be detected automatically. Open up the “Product Information” tab under the “Basic Functions” menu to confirm that the encoder resolution was detected. For example, the resolution detected was 0.01[um/Pulse].

Motor	Model/Type	Number	Manufacturing Date	SW Ver.	Remarks
1	Motor	SGLGW-40A140CP	1995.95		[Resolution] : 0.010000 [um/Pulse] [Encoder type] : absolute
	Encoder	JZDP-M007-252	MITU-ST1381A0000	2017.10	

5. Run “Polarity detection” under the “Encoder Setting” menu. If the Polarity detection option is grayed out, disconnect and search again for the SERVOPACK. Then reconnect with SigmaWin+ and the “Polarity detection” menu option should be available. Click “Continue” in the pop-up window.

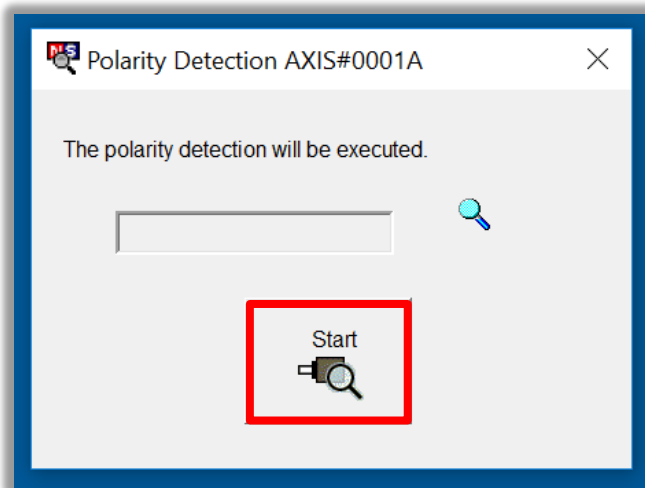


**Title:** Mitutoyo ST1300 Set-up Guide

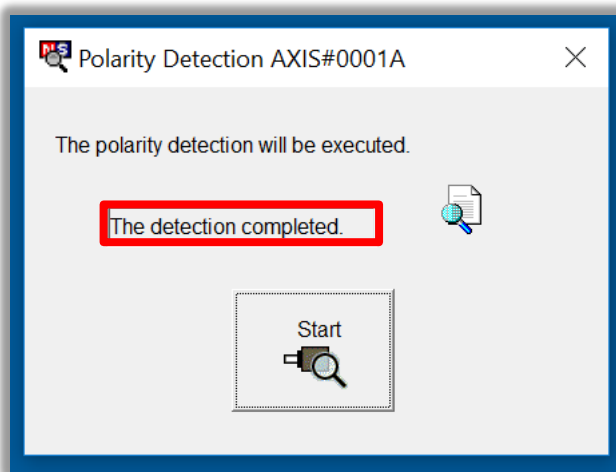
**Product(s):** Sigma-5, Sigma-7, SigmaWin+ ver. 7, SigmaTrac, SGL Series Linear Motors

DOC. NO. AN.MTN.15

- a. Click the “Start” button to begin polarity detection.



- b. Cycle Power to the SERVOPACK after polarity detection has completed. If the motor is jogged before cycling power, an A.C22 alarm will appear after a power cycle and polarity detection will need to be executed again.



**Note:** If Pn080.1 (leading phase) is written to, Pn587 will need to be set to 1 to enable re-detecting polarity otherwise an A.C22 alarm will occur upon power cycle of the drive.

**Title:** Mitutoyo ST1300 Set-up Guide

**Product(s):** Sigma-5, Sigma-7, SigmaWin+ ver. 7,  
SigmaTrac, SGL Series Linear Motors

**DOC. NO.** AN.MTN.15

6. The motor and encoder should be operating properly. If any issues occur, be sure to check the troubleshooting appendix at the end of this document for more information.



**Title:** Mitutoyo ST1300 Set-up Guide

**Product(s):** Sigma-5, Sigma-7, SigmaWin+ ver. 7,  
SigmaTrac, SGL Series Linear Motors

DOC. NO. AN.MTN.15

### Appendix: Troubleshooting

- **A.070** alarm: Run the “Reset Motor Type Alarm” function under the “Troubleshooting” menu. Run a Software Reset after resetting the motor type alarm
- **A.040** alarm: The drive requires a motor parameter file to be imported. Import motor parameter following the instructions in **step 2** of the instructions above.
- **A.041** alarm: Set Pn281 and Pn385 to appropriate values to clear the alarm using the equation below. See the Sigma-7 series AC Servo Drive Product Manual for further details.

The setting range depends on the Servomotor’s maximum speed (Pn385) and the linear scale pitch (Pn282).\* You can calculate the upper limit of the setting of Pn281 with the following formula.

$$\text{Upper limit of Pn281} = \frac{\text{Linear Encoder Pitch} \times 100}{\text{Pn385}} \times 72$$

- **A.C21** alarm: Follow the instructions given in **step 3** above.
- **A.C22** alarm: Run “Polarity detection” as described in **step 5** above.