Installing and Configuring Linear Encoder Buffer Card on Tiger/TG-1000

The following tech note will walk user thru installing, configuring and troubleshooting any issues related to the Linear Encoder Buffer Card.

Figure 1: Linear Encoder Buffer card, Left card is for MicroE and Renishaw. Right is for Heidenhain

Linear Encoder (LE) buffer card is an add-on card for Two Axis card (configured either as a XY or ZF card) to enable them to interface with either MicroE, Renishaw and Heidenhain brand Linear Encoders.

Pinouts for MicroE, Renishaw LEs are the same so they use the same LE buffer card, while a different card is available for Heidenhain. MicroE, Renishaw card is marked "RnM" on PCB silkscreen, while Heidenhain buffer cards are marked as "Heidenhain".

Note: Connecting Linear Encoders to the wrong Buffer card may cause permanent damage. Please check and contact ASI if you are unsure.

Figure 2: Two axis card with Linear Encoder Connector shown

The LE Buffer card is connected thru a straight 10pin ribbon cable to SV7 connector on the to the Two Axis card.
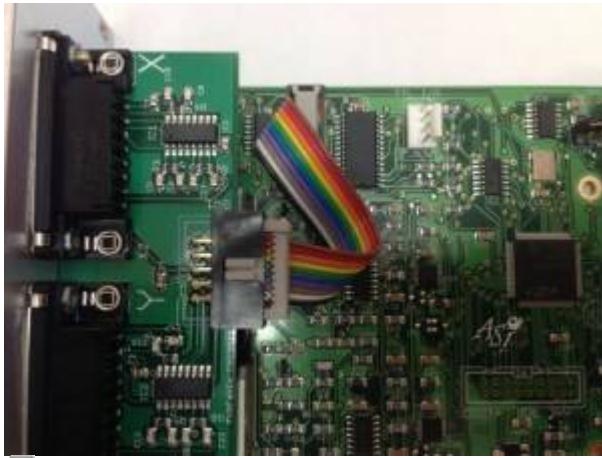
Figure 3 LE Buffer card and Two axis card are connected with a 10pin straight ribbon header connector

Figure 4: Placement of LE buffer card and Two Axis card

In the Schroff case, install it next to the Two Axis card.

Firmware Configuration

Once Installed, use a serial terminal program and issue the following command to have the Two Axis Card use the Linear Encoders to get position instead of the Rotary Encoders.

`<Card Address>CCA X=1`

Card Address is engraved on the card's front panel, like "1:XY" means card address is "1", "2:ZF" means card address is "2" etc.

If the card is marked "1:XY", then command is

`1CCA X=1`

A system restart is needed for changes to take effect.

To revert back to rotary encoder mode, command is `<Card Address>CCA X=2`

If your Linear Encoder's resolution is 10nm, set the Two axis card up for 10nm resolution with serial command `<Card Address>CCA X=21`

If your Linear Encoder's resolution is 20nm, set the Two axis card up for 20nm resolution with serial command `<Card Address>CCA X=22`

For more details, refer to Command:CUSTOMA.

Troubleshooting

In Linear Encoder mode, a serial move command is issued, and the axis stalls and disables itself (front panel LED blinks Red to orange). It could be because the encoder polarity is setup incorrectly. On some stages, LE read head might be in reverse direction.

There are two ways for the user to change encoder polarity .
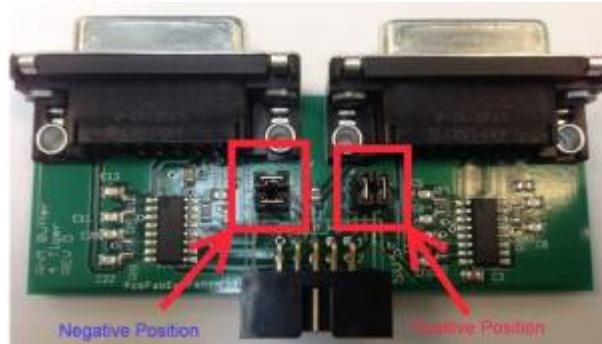
Figure 5: Adjusting the Encoder Polarity. Left is Y/F axis jumpers. Right is X/Z axis jumpers

1) Hardware , Linear Encoder buffer cards have a jumpers. By setting them in vertically encoder polarity is positive, by setting them horizontally, encoder polarity is negative.

2) Firmware, Second approch is to use the serial command to change the encoder polarity in firmware. Command is EPOL command.

EPOL <Axis Char>= [1 or -1]

Say if Y axis was stalling and disabling user can change the polarity like this

query the controller for current Y polarity

```
EPOL Y?
:A 1
```

controller replies with 1, indicating positive polarity

```
EPOL Y=-1
:A
```

set Y polarity as negative

```
MC Y+
:A
```

enable the disabled axis

Do a test move to check if the axis is working

```
R Y=12345
:A
```

Use Command:SAVESET command to save setting to non volatile memory.

Firmware settings are lost when cards are reprogrammed, so hardware jumper rearrangement is recommended. Changelog

tech note, tiger