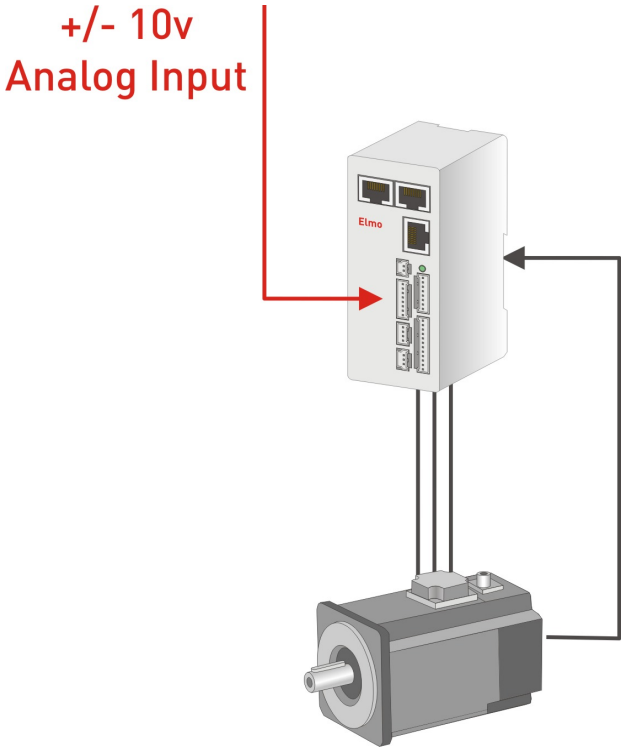
Analog input offset and gain adjustment



Application Note

April 2008

Elmo
Motion Control

1.1 Scope

The following document describes a method to adjust Elmo driver analog input offset for receiving a minimum gain error inaccuracy. For getting high linearity over the full range of input voltage a simple offset adjustment procedure may be implemented. This document describe the adjustment procedure by special example case, this procedure may be implemented with slight changes to other cases.

1.2 Introduction

Elmo servo drive is equipped with 14 bit resolution analog input. The maximum operating differential voltage of this input is +-10V dc. The following procedure will correct the analog input offset and also will compensate the velocity analog input gain AG[2].

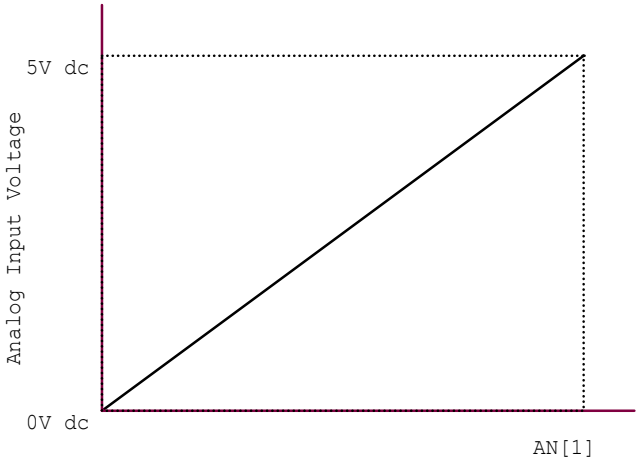


Figure 1: Analog input voltage vs. analog input readout

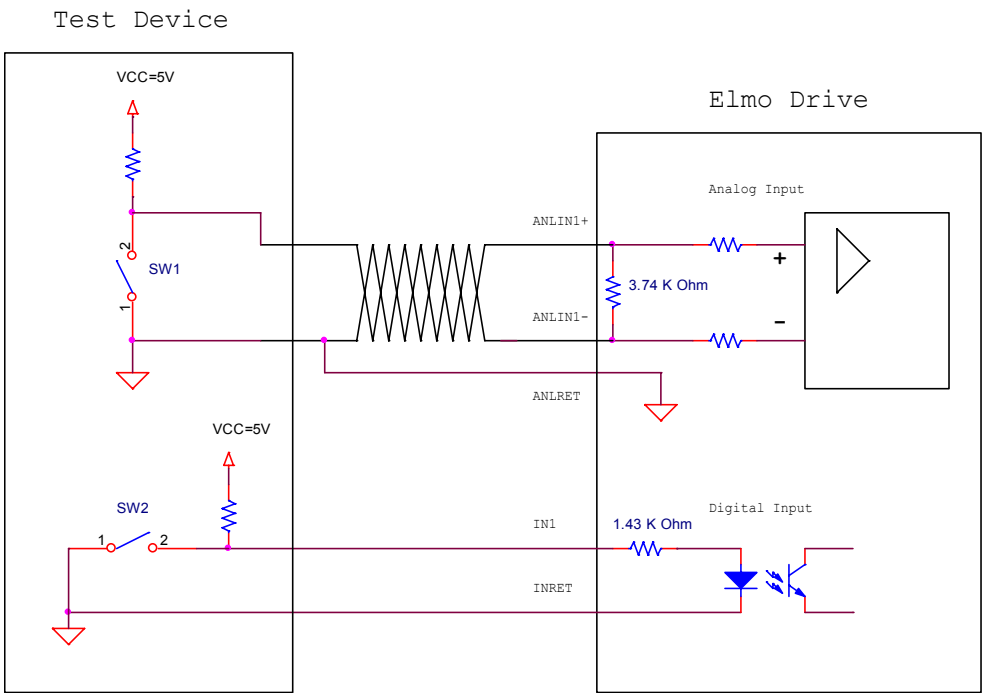


Figure 2: suggested test device for analog input adjustment

1.3 Procedure steps

1. Download the following program AnalogOffsetCorrection.ehl into your drive. In case that you have your own program implement the following code into your program.
2. Apply 0V dc between ANLIN1+ and ANLIN1- by closing SW1.
3. Set On the offset correction by opening SW2 (N.C Switch).
4. Apply precise 5V dc between ANLIN1+ and ANLIN1- pins by opening SW1.
5. Set On the offset correction by closing SW2.
6. Wait about 5 sec for AG[2] settings and parameter savings.
7. Turn off the system and disconnect the test device.
8. Your analog input is adjusted by this step.

```
#@AUTOEXEC

    int i,flag
```

```
    float AN_avarage
    flag=0
    il[1]=7                                 // general purpose input #1 active high
while(1)                                        // infinite loop wait for offset SW#1
    On/Off
    until(flag==1)                              // offset correction
    flag=0
    until(flag==1)
end while
@AUTO_I1
      if (il[1]==7)                         // if general purpose input #1 active high
            flag=0
            mo=0
            um=2
            as[1]=0
                  AN_avarage=0
                  for i=1:100               // calculate an[1] average of 100 readings
                        AN_avarage=AN_avarage+an[1]
                  end
                  as[1]=AN_avarage/100.0    // set analog input offset
                  il[1]=6                   // general purpose input #1 active low
                  flag=1
      else                                  // if general purpose input #1 active low
                  ag[2]=ag[2]*(an[1]/5.0)   // set velocity new gain
                  save()                    // save parameters into flash memory
                  wait(5000)                // wait until save finished
                  il[1]=7                   // general purpose input #1 active high
                  flag=0
      end if
    return
```