1. WFS Steering Mirror

1.1 Description

A Steering Mirror is controlled using 2 D/A inputs. 2 A/D outputs are read to confirm the position of the mirror. The following diagram illustrates the control mechanism for this device.

Although the A/D resolution is 12-bit and the D/A resolution is 14-bits, the ethertrak module used signed 16-bit value when reporting the values of the registers. There are mapping of the voltage and digital values:

<table>
<thead>
<tr>
<th>Defines</th>
<th>MINIMUM</th>
<th>Mid-Point</th>
<th>MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hex</td>
<td>INT16_MIN</td>
<td>0</td>
<td>INT16_MAX</td>
</tr>
<tr>
<td>Decimal</td>
<td>-32768</td>
<td>0</td>
<td>32767</td>
</tr>
<tr>
<td>Voltage</td>
<td>-10</td>
<td>0</td>
<td>10</td>
</tr>
</tbody>
</table>

Volts-to-decimal: \[ i = (v+10) / 20 \times 65535 - 32768 \]

Decimal-to-volts: \[ v = (i + 32768) / 65535 \times 20 - 10 \]
1.2 SMirror commands

The SMirror is normally controlled from AO’s Graphical User Interface. The GUI executes programs to initialize and move the smirror. You can also run these applications from the command line by login into the AOUI and running the programs from ~/current/mech.

1.2.1 smirror_init – Steering-mirror initialization command

SYNOPSIS: smirror_init [ -svh ]

DESCRIPTION: This command initializes the X and Y D/A values to a default position. The following command line options are available:

- s  Standalone. Normally the command updates AO’s Motor shared memory area. It is possible to ignore the motor shared memory using the –s option.

- v  Verbose. Various messages are printed to standard output during execution.

- h  Help. Displays a short summary of the command’s arguments and options.

1.2.2 smirror_pos – steering mirror position command

SYNOPSIS: smirror_pos [ -svh ] x-binary-value y-binary-value

DESCRIPTION: This command will position the Smirror’s X and Y axis to the indicated position. The following command line options are available:

- s  Standalone. Normally the command updates AO’s Motor shared memory area. It is possible to ignore the motor shared memory using the –s option.

- v  Verbose. Various messages are printed to standard output during execution.

- h  Help. Displays a short summary of the command’s arguments and options.