SAM

Interface of the SOAR M3 with Tip-Tilt Error Sensor

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Applicable documents

SOARTT-8403 SOAR M3 Drivers
SOARTT-TBD SOAR M3 Labview Interface Module

1   Electronic Interface

The TT sensor computer will provide a free slot to hold the PCI interface board to the M3 mirror servo. See document TBD by Mike Warner probably on how to obtain a M3 PCI interface board.

2   Software interface

SOAR provides software drivers to use the PCI interface board to the M3. The driver can operate under buffering mode and fast mode. Buffering mode use the write interface through a character device. The fast mode requires some external function definitions at kernel level. An ioctl interface is also available for mode selection.

2.1   External Function Definitions

The following is the list of routines that the TT sensor program should export to use the driver under fast mode.

unsigned short fg_reset_gamma (int *offset*)

> Resets the M3 mirror to its nominal elevation position. The value *offset* in units of ADU is added to the M3 nominal position.

> **Parameters:**
> > *offset*   A value in ADU to be added to the nominal elevation position.
> **Returns:**
> > The elevation command angle in units of ADU is returned.

unsigned short fg_reset_beta (int *offset*)

Resets the M3 mirror to its nominal azimuth position. The value *offset* in units of ADU is added to the M3 nominal position.

Parameters:
>*offset*   A value in ADU to be added to the nominal azimuth position.

Returns:
>The azimuth command angle in units of ADU is returned.

unsigned short fg_integrate_gamma (int *offset*)

Integrate the elevation error and return the elevation command angle in units of ADU.

Parameters:
>*offset*   A value in units of ADU to be added to the command that results from integrating the elevation error.

Return:
>The elevation command angle in units of ADU is returned.

unsigned short fg_integrate_beta (int *offset*)

Integrate the azimuth error and return the azimuth command angle in units of ADU.

Parameters:
>*offset*   A value in units of ADU to be added to the azimuth command that results from integrating the azimuth error.

Return:
>The azimuth command angle in units of ADU is returned.

int fg_get_state (*void*)

Get the current state of the Tip Tilt Sensor.

Parameters
>*void*   No parameters needed

Return:
>- FAST_ON if the TT control loop is closed.
>- FAST _OFF if the TT control loop is open.

2.2 IOCTL Interface

The M3 driver provides an IOCTL interface to configure the driver operation. This is the common path for user space applications to access the driver. A Labview interface module exists that puts a native Labview layer on top of this minimalistic interface (see document TBD). The following ioctl calls are supported by the device file /dev/ttcomms:

TT_GO

> Set the transmission flag to true. This will produce inmediate transmission of the mirror position after sericing IRQ.

TT_HALT

> Set the transmission flag to false. The driver will stop transmitting mirror position to the M3 servo after servicing IRQ.

TT_FAST_ENABLE

> Set the driver operation mode to control loop mode. The kernel interfaces will be used to obtain the mirror position.

TT_TEST_DISABLE

> Turn the debug square signals off.

TT_TEST_GAMMA

> Turn the debug square signal on for the elevation axis. A square signal of 3200 ADU at 0.25Hz is added to the mirror command.

TT_TEST_BETA

> Turn the debug square signal on for the azimuth axis. A square signal of 3200 ADU at 0.25Hz is added to the mirror command.

For more precise information consult the <ttcomms.h> file.