

libcin

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Chapter 1

Module Index

1.1 Modules

Here is a list of all modules:

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Chapter 2

Class Index

2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

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Chapter 3

File Index

3.1 File List

Here is a list of all documented files with brief descriptions:

src/ cin.h	19
src/ cin_register_map.h	??
src/ cinregisters.h	??
src/ common.h	??
src/ config.h	??
src/ control.h	??
src/ data.h	??
src/ descramble.h	??
src/ descramble_map.h	??
src/ fclk_program.h	??
src/ fifo.h	??
src/ report.h	??
src/ version.h	??

Chapter 4

Module Documentation

4.1 Cin Control Routines

Functions

- int [cin_ctl_init](#) ([cin_ctl_t](#) *cin, const char *ipaddr, uint16_t oport, uint16_t ippor, uint16_t soport, uint16_t siport)
- int [cin_ctl_destroy](#) ([cin_ctl_t](#) *cin)
- int [cin_ctl_read](#) ([cin_ctl_t](#) *cin, uint16_t reg, uint16_t *val)
- int [cin_ctl_write](#) ([cin_ctl_t](#) *cin, uint16_t reg, uint16_t val, int wait)
- int [cin_ctl_stream_write](#) ([cin_ctl_t](#) *cin, char *val, int size)
- int [cin_ctl_write_with_readback](#) ([cin_ctl_t](#) *cin, uint16_t reg, uint16_t val)
- int [cin_ctl_pwr](#) ([cin_ctl_t](#) *cin, int pwr)
- int [cin_ctl_fp_pwr](#) ([cin_ctl_t](#) *cin, int pwr)
- int [cin_ctl_fo_test_pattern](#) ([cin_ctl_t](#) *cin, int on_off)
- int [cin_ctl_load_config](#) ([cin_ctl_t](#) *cin, char *filename)
- int [cin_ctl_load_firmware](#) ([cin_ctl_t](#) *cin, char *filename)
- int [cin_ctl_set_fclk](#) ([cin_ctl_t](#) *cin, int clkfreq)
- int [cin_ctl_get_fclk](#) ([cin_ctl_t](#) *cin, int *clkfreq)
- int [cin_ctl_freeze_dco](#) ([cin_ctl_t](#) *cin, int freeze)
- int [cin_ctl_get_cfg_fpga_status](#) ([cin_ctl_t](#) *cin, uint16_t *_val)
- int [cin_ctl_get_id](#) ([cin_ctl_t](#) *cin, [cin_ctl_id_t](#) *_val)
- void [cin_ctl_display_id](#) (FILE *out, [cin_ctl_id_t](#) val)
- void [cin_ctl_display_fpga_status](#) (FILE *out, uint16_t val)
- int [cin_ctl_get_dcm_status](#) ([cin_ctl_t](#) *cin, uint16_t *_val)
- void [cin_ctl_display_dcm_status](#) (FILE *out, uint16_t *_val)
- double [cin_ctl_current_calc](#) (uint16_t val)
- int [cin_ctl_get_power_status](#) ([cin_ctl_t](#) *cin, int full, int *pwr, [cin_ctl_pwr_mon_t](#) *values)
- void [cin_ctl_display_pwr](#) (FILE *out, [cin_ctl_pwr_mon_t](#) *values)
- void [cin_ctl_display_pwr_line](#) (FILE *out, const char *msg, [cin_ctl_pwr_val_t](#) val)
- int [cin_ctl_calc_vi_status](#) ([cin_ctl_t](#) *cin, uint16_t vreg, uint16_t ireg, double vfact, [cin_ctl_pwr_val_t](#) *vi)
- int [cin_ctl_get_camera_pwr](#) ([cin_ctl_t](#) *cin, int *val)
- int [cin_ctl_set_camera_pwr](#) ([cin_ctl_t](#) *cin, int val)
- int [cin_ctl_set_bias](#) ([cin_ctl_t](#) *cin, int val)
- int [cin_ctl_get_bias](#) ([cin_ctl_t](#) *cin, int *val)
- int [cin_ctl_set_clocks](#) ([cin_ctl_t](#) *cin, int val)
- int [cin_ctl_get_clocks](#) ([cin_ctl_t](#) *cin, int *val)
- int [cin_ctl_set_trigger](#) ([cin_ctl_t](#) *cin, int val)
- int [cin_ctl_get_trigger](#) ([cin_ctl_t](#) *cin, int *val)
- int [cin_ctl_set_focus](#) ([cin_ctl_t](#) *cin, int val)

- int **cin_ctl_get_focus** (cin_ctl_t *cin, int *val)
- int **cin_ctl_get_triggering** (cin_ctl_t *cin, int *trigger)
- int **cin_ctl_int_trigger_start** (cin_ctl_t *cin, int nimages)
- int **cin_ctl_int_trigger_stop** (cin_ctl_t *cin)
- int **cin_ctl_ext_trigger_start** (cin_ctl_t *cin, int trigger_mode)
- int **cin_ctl_ext_trigger_stop** (cin_ctl_t *cin)
- int **cin_ctl_set_exposure_time** (cin_ctl_t *cin, float e_time)
- int **cin_ctl_set_trigger_delay** (cin_ctl_t *cin, float t_time)
- int **cin_ctl_set_cycle_time** (cin_ctl_t *cin, float ftime)
- int **cin_ctl_frame_count_reset** (cin_ctl_t *cin)
- int **cin_ctl_set_mux** (cin_ctl_t *cin, int setting)
- int **cin_ctl_get_mux** (cin_ctl_t *cin, int *setting)
- int **cin_ctl_set_fcric_gain** (cin_ctl_t *cin, int gain)
- int **cin_ctl_set_fabric_address** (cin_ctl_t *cin, char *ip)
- int **cin_ctl_reg_dump** (cin_ctl_t *cin, FILE *fp)
- int **cin_ctl_get_bias_voltages** (cin_ctl_t *cin, float *voltage)
- int **cin_ctl_set_bias_voltages** (cin_ctl_t *cin, float *voltage)
- int **cin_ctl_set_fcric_clamp** (cin_ctl_t *cin, int clamp)

4.1.1 Detailed Description

4.1.2 Function Documentation

4.1.2.1 int cin_ctl_destroy (cin_ctl_t * cin)

Destroy (close) the cin control library

Close connections, free memory and exit library

Parameters

<i>cin</i>	handle to cin library
------------	-----------------------

Returns

Returns 0 on success non-zero if error

4.1.2.2 int cin_ctl_init (cin_ctl_t * cin, const char * ipaddr, uint16_t oport, uint16_t iport, uint16_t soport, uint16_t siport)

Initialize the cin control library

Initialize the control structures and communications with the CIN via the control interface. This function opens the UDP ports and starts a listening thread to receive packets from the CIN.

Parameters

<i>cin</i>	handle to cin library
<i>ipaddr</i>	ip address of CIN base address
<i>oport</i>	output udp port of cin
<i>iport</i>	input udp port of cin
<i>soport</i>	stream output udp port of cin
<i>siport</i>	stream input udp port of cin

Returns

Returns 0 on success non-zero if error

4.1.2.3 `int cin_ctl_read (cin_ctl_t * cin, uint16_t reg, uint16_t * val)`

Read register from CIN

Parameters

<i>cin</i>	handle to cin library
<i>reg</i>	register to read
<i>val</i>	variable to read value of register to

Returns

Returns 0 on success non-zero if error

4.1.2.4 int cin_ctl_stream_write (cin_ctl_t * cin, char * val, int size)

Write stream data to CIN

Parameters

<i>cin</i>	handle to cin library
<i>val</i>	array of values to write
<i>size</i>	size of array pointed to by val

Write stream data to cin in form of 16 bit array.

Returns

Returns 0 on success non-zero if error

4.1.2.5 int cin_ctl_write (cin_ctl_t * cin, uint16_t reg, uint16_t val, int wait)

Write register to CIN

Parameters

<i>cin</i>	handle to cin library
<i>reg</i>	register to write to
<i>val</i>	value to write to register
<i>wait</i>	if non-zero

Write register value to CIN. If wait is non-zero then wait a sleep time of i CIN_CTL_WRITE_SLEEP before releasing the mutex to add flow control to the cin.

Returns

Returns 0 on success non-zero if error

4.1.2.6 int cin_ctl_write_with_readback (cin_ctl_t * cin, uint16_t reg, uint16_t val)

Write register to CIN with readback verification

Parameters

<i>cin</i>	handle to cin library
<i>reg</i>	register to write to
<i>val</i>	value to write to register

Write register value to CIN. Follow write with read of register and compare value. CIN_CTL_WRITE_SLEEP before releasing the mutex to add flow control to the cin.

Returns

Returns 0 on success non-zero if error

4.2 CIN Data Framestore Functions

Data group

Chapter 5

Class Documentation

5.1 cin_ctl Struct Reference

Public Attributes

- [cin_port_t](#) **ctl_port**
- [cin_port_t](#) **stream_port**
- [cin_ctl_config_t](#) **config**
- [cin_ctl_listener_t](#) * **listener**
- [pthread_mutex_t](#) **access**
- [pthread_mutexattr_t](#) **access_attr**

The documentation for this struct was generated from the following file:

- [src/cin.h](#)

5.2 cin_ctl_config Struct Reference

Public Attributes

- char **name** [CIN_CONFIG_MAX_STRING]
- char **firmware_filename** [CIN_CONFIG_MAX_STRING]
- int **overscan**
- int **columns**
- int **fclk**
- uint16_t **timing** [CIN_CONFIG_MAX_DATA][2]
- int **timing_len**
- uint16_t **fcric** [CIN_CONFIG_MAX_DATA][2]
- int **fcric_len**
- uint16_t **bias** [CIN_CONFIG_MAX_DATA][2]
- int **bias_len**

The documentation for this struct was generated from the following file:

- [src/cin.h](#)

5.3 cin_ctl_id Struct Reference

Public Attributes

- uint16_t **board_id**
- uint16_t **serial_no**
- uint16_t **fpga_ver**

The documentation for this struct was generated from the following file:

- src/[cin.h](#)

5.4 cin_ctl_listener Struct Reference

Public Attributes

- struct [cin_port](#) * **cp**
- [fifo](#) **ctl_fifo**
- pthread_t **thread_id**

The documentation for this struct was generated from the following file:

- src/[cin.h](#)

5.5 cin_ctl_pwr_mon_t Struct Reference

Public Attributes

- [cin_ctl_pwr_val_t](#) **bus_12v0**
- [cin_ctl_pwr_val_t](#) **mgmt_3v3**
- [cin_ctl_pwr_val_t](#) **mgmt_2v5**
- [cin_ctl_pwr_val_t](#) **mgmt_1v2**
- [cin_ctl_pwr_val_t](#) **enet_1v0**
- [cin_ctl_pwr_val_t](#) **s3e_3v3**
- [cin_ctl_pwr_val_t](#) **gen_3v3**
- [cin_ctl_pwr_val_t](#) **gen_2v5**
- [cin_ctl_pwr_val_t](#) **v6_0v9**
- [cin_ctl_pwr_val_t](#) **v6_1v0**
- [cin_ctl_pwr_val_t](#) **v6_2v5**
- [cin_ctl_pwr_val_t](#) **fp**

The documentation for this struct was generated from the following file:

- src/[cin.h](#)

5.6 cin_ctl_pwr_val Struct Reference

Public Attributes

- double **i**

- double **v**

The documentation for this struct was generated from the following file:

- [src/cin.h](#)

5.7 cin_data Struct Reference

Public Attributes

- [fifo](#) * **packet_fifo**
- [fifo](#) * **frame_fifo**
- [fifo](#) * **image_fifo**
- [cin_data_threads_t](#) **listen_thread**
- [cin_data_threads_t](#) **assembler_thread**
- [cin_data_threads_t](#) **descramble_thread**
- [pthread_mutex_t](#) **listen_mutex**
- [pthread_mutex_t](#) **assembler_mutex**
- [pthread_mutex_t](#) **descramble_mutex**
- [pthread_mutex_t](#) **stats_mutex**
- [pthread_mutex_t](#) **framestore_mutex**
- [cin_data_callbacks_t](#) **callbacks**
- [cin_port_t](#) **dp**
- struct timespec **framerate**
- unsigned long int **dropped_packets**
- unsigned long int **malformed_packets**
- uint16_t **last_frame**
- [descramble_map_t](#) **map**
- int **framestore_mode**
- struct timespec **framestore_trigger**
- int **framestore_counter**

The documentation for this struct was generated from the following file:

- [src/cin.h](#)

5.8 cin_data_callbacks Struct Reference

Public Attributes

- void (*)(**push**)([cin_data_frame_t](#) *)
- void (*)(**pop**)([cin_data_frame_t](#) *)
- [cin_data_frame_t](#) * **frame**

The documentation for this struct was generated from the following file:

- [src/cin.h](#)

5.9 cin_data_frame Struct Reference

Public Attributes

- uint16_t * **data**
- uint16_t **number**
- struct timespec **timestamp**
- int **size_x**
- int **size_y**
- void * **usr_ptr**

The documentation for this struct was generated from the following file:

- [src/cin.h](#)

5.10 cin_data_packet Struct Reference

Public Attributes

- unsigned char * **data**
- int **size**
- struct timespec **timestamp**

The documentation for this struct was generated from the following file:

- [src/data.h](#)

5.11 cin_data_proc Struct Reference

Public Attributes

- void (*)(**input_get**)(void *, int)
- void (*)(**input_put**)(void *, int)
- void * **input_args**
- int **reader**
- void (*)(**output_put**)(void *)
- void (*)(**output_get**)(void *)
- void * **output_args**
- [cin_data_t](#) * **parent**

The documentation for this struct was generated from the following file:

- [src/data.h](#)

5.12 cin_data_stats Struct Reference

Public Attributes

- int **last_frame**
- double **framerate**

- double **datarate**
- double **packet_percent_full**
- double **frame_percent_full**
- double **image_percent_full**
- long int **packet_overruns**
- long int **frame_overruns**
- long int **image_overruns**
- long int **packet_used**
- long int **frame_used**
- long int **image_used**
- long int **dropped_packets**
- long int **mallformed_packets**

The documentation for this struct was generated from the following file:

- [src/cin.h](#)

5.13 cin_data_threads Struct Reference

Public Attributes

- pthread_t **thread_id**
- int **started**

The documentation for this struct was generated from the following file:

- [src/cin.h](#)

5.14 cin_map_t Struct Reference

Public Attributes

- char * **name**
- uint16_t **reg**

The documentation for this struct was generated from the following file:

- [src/cinregisters.h](#)

5.15 cin_port Struct Reference

Public Attributes

- char * **srvaddr**
- char * **cliaddr**
- uint16_t **srvport**
- uint16_t **cliport**
- int **sockfd**
- struct timeval **tv**
- struct sockaddr_in **sin_srv**
- struct sockaddr_in **sin_cli**

- socklen_t **slen**
- int **rcvbuf**
- int **rcvbuf_rb**

The documentation for this struct was generated from the following file:

- src/[cin.h](#)

5.16 descramble_map_t Struct Reference

Public Attributes

- uint32_t * **map**
- int **size_x**
- int **size_y**
- int **overscan**
- int **rows**

The documentation for this struct was generated from the following file:

- src/[cin.h](#)

5.17 fifo Struct Reference

Public Attributes

- void * **data**
- void * **head**
- void * **tail** [FIFO_MAX_READERS]
- void * **end**
- int **readers**
- long int **size**
- int **elem_size**
- int **full**
- long int **overruns**
- pthread_mutex_t **mutex**
- pthread_cond_t **signal**

The documentation for this struct was generated from the following file:

- src/[cin.h](#)

Chapter 6

File Documentation

6.1 src/cin.h File Reference

```
#include <stdint.h>
#include <stdio.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <netinet/ip.h>
#include <sys/time.h>
#include <pthread.h>
```

Classes

- struct [cin_ctl_config](#)
- struct [fifo](#)
- struct [cin_ctl_listener](#)
- struct [cin_port](#)
- struct [cin_ctl](#)
- struct [cin_data_frame](#)
- struct [cin_data_stats](#)
- struct [cin_data_threads](#)
- struct [cin_data_callbacks](#)
- struct [descramble_map_t](#)
- struct [cin_data](#)
- struct [cin_ctl_id](#)
- struct [cin_ctl_pwr_val](#)
- struct [cin_ctl_pwr_mon_t](#)

Macros

- `#define CIN_CTL_IP "192.168.1.207"`
- `#define CIN_CTL_SVR_PORT 49200`
- `#define CIN_CTL_CLI_PORT 50200`
- `#define CIN_CTL_SVR_FRMW_PORT 49202`
- `#define CIN_CTL_CLI_FRMW_PORT 50202`
- `#define CIN_CTL_MAX_READ_TRIES 10`
- `#define CIN_CTL_MAX_WRITE_TRIES 5`
- `#define CIN_CTL_WRITE_SLEEP 2000`

- #define **CIN_CTL_POWER_ENABLE** 0x001F
- #define **CIN_CTL_POWER_DISABLE** 0x0000
- #define **CIN_CTL_FP_POWER_ENABLE** 0x0020
- #define **CIN_CTL_DCM_LOCKED** 0x0001
- #define **CIN_CTL_DCM_PSDONE** 0x0002
- #define **CIN_CTL_DCM_STATUS0** 0x0004
- #define **CIN_CTL_DCM_STATUS1** 0x0008
- #define **CIN_CTL_DCM_STATUS2** 0x0010
- #define **CIN_CTL_DCM_TX1_READY** 0x0020
- #define **CIN_CTL_DCM_TX2_READY** 0x0040
- #define **CIN_CTL_DCM_ATCA_ALARM** 0x0080
- #define **CIN_CTL_TRIG_INTERNAL** 0x0000
- #define **CIN_CTL_TRIG_EXTERNAL_1** 0x0001
- #define **CIN_CTL_TRIG_EXTERNAL_2** 0x0002
- #define **CIN_CTL_TRIG_EXTERNAL_BOTH** 0x0003
- #define **CIN_CTL_FOCUS_BIT** 0x0002
- #define **CIN_CTL_FCLK_125** 0x0000
- #define **CIN_CTL_FCLK_200** 0x0001
- #define **CIN_CTL_FCLK_250** 0x0002
- #define **CIN_CTL_FCLK_125_C** 0x0003
- #define **CIN_CTL_FCLK_200_C** 0x0004
- #define **CIN_CTL_FCLK_250_C** 0x0005
- #define **CIN_CTL_FCLK_156_C** 0x0006
- #define **CIN_CTL_FPGA_STS_CFG** 0x8000
- #define **CIN_CTL_FPGA_STS_FP_PWR** 0x0008
- #define **CIN_CTL_DCM_STS_ATCA** 0x0080
- #define **CIN_CTL_DCM_STS_LOCKED** 0x0001
- #define **CIN_CTL_DCM_STS_OVERRIDE** 0x0800
- #define **CIN_CTL_MUX1_VCLK1** 0x0001
- #define **CIN_CTL_MUX1_VCLK2** 0x0002
- #define **CIN_CTL_MUX1_VCLK3** 0x0003
- #define **CIN_CTL_MUX1_ATG** 0x0004
- #define **CIN_CTL_MUX1_VFCLK1** 0x0005
- #define **CIN_CTL_MUX1_VFCLK2** 0x0006
- #define **CIN_CTL_MUX1_VFCLK3** 0x0007
- #define **CIN_CTL_MUX1_HCLK1** 0x0008
- #define **CIN_CTL_MUX1_HCLK2** 0x0009
- #define **CIN_CTL_MUX1_OSW** 0x000A
- #define **CIN_CTL_MUX1_RST** 0x000B
- #define **CIN_CTL_MUX1_CONVERT** 0x000C
- #define **CIN_CTL_MUX1_SHUTTER** 0x000D
- #define **CIN_CTL_MUX1_SWTRIGGER** 0x000E
- #define **CIN_CTL_MUX1_TRIGMON** 0x000F
- #define **CIN_CTL_MUX1_EXPOSE** 0x0000
- #define **CIN_CTL_MUX2_VCLK1** 0x0010
- #define **CIN_CTL_MUX2_VCLK2** 0x0020
- #define **CIN_CTL_MUX2_VCLK3** 0x0030
- #define **CIN_CTL_MUX2_ATG** 0x0040
- #define **CIN_CTL_MUX2_VFCLK1** 0x0050
- #define **CIN_CTL_MUX2_VFCLK2** 0x0060
- #define **CIN_CTL_MUX2_VFCLK3** 0x0070
- #define **CIN_CTL_MUX2_HCLK1** 0x0080
- #define **CIN_CTL_MUX2_HCLK2** 0x0090
- #define **CIN_CTL_MUX2_HCLK3** 0x00A0
- #define **CIN_CTL_MUX2_OSW** 0x00B0

- **#define CIN_CTL_MUX2_RST** 0x00C0
- **#define CIN_CTL_MUX2_CONVERT** 0x00D0
- **#define CIN_CTL_MUX2_SAVE** 0x00E0
- **#define CIN_CTL_MUX2_HWTRIG** 0x00F0
- **#define CIN_CTL_MUX2_EXPOSE** 0x0000
- **#define CIN_CTL_FO_REG1** 0x821D
- **#define CIN_CTL_FO_REG2** 0x821E
- **#define CIN_CTL_FO_REG3** 0x821F
- **#define CIN_CTL_FO_REG4** 0x8001
- **#define CIN_CTL_FO_REG5** 0x8211
- **#define CIN_CTL_FO_REG6** 0x8212
- **#define CIN_CTL_FO_REG7** 0x8213
- **#define CIN_DATA_IP** "10.0.5.207"
- **#define CIN_DATA_PORT** 49201
- **#define CIN_DATA_CTL_PORT** 49203
- **#define CIN_DATA_MAX_MTU** 9000
- **#define CIN_DATA_UDP_HEADER** 8
- **#define CIN_DATA_MAGIC_PACKET** UINT64_C(0x0000F4F3F2F1F000)
- **#define CIN_DATA_MAGIC_PACKET_MASK** UINT64_C(0x0000FFFFFFFFFFFF00)
- **#define CIN_DATA_TAIL_MAGIC_PACKET** UINT64_C(0x010DF0ADDEF2F1F0)
- **#define CIN_DATA_TAIL_MAGIC_PACKET_MASK** UINT64_C(0xFFFFFFFFFFFFFFF0)
- **#define CIN_DATA_DROPPED_PACKET_VAL** 0x2000
- **#define CIN_DATA_DATA_MASK** 0x1FFF
- **#define CIN_DATA_CTRL_MASK** 0xE000
- **#define CIN_DATA_SIGN_MASK** 0x1000
- **#define CIN_DATA_GAIN_8** 0xC000
- **#define CIN_DATA_GAIN_4** 0x4000
- **#define CIN_DATA_PACKET_LEN** 8184
- **#define CIN_DATA_MAX_PACKETS** 542
- **#define CIN_DATA_RCVBUF** 100
- **#define CIN_DATA_MAX_FRAME_X** 1152
- **#define CIN_DATA_MAX_FRAME_Y** 2050
- **#define CIN_DATA_MAX_STREAM** 2400000
- **#define CIN_DATA_CCD_COLS** 96
- **#define CIN_DATA_CCD_COLS_PER_CHAN** 10
- **#define CIN_DATA_PIPELINE_FLUSH** 1344
- **#define CIN_DATA_MODE_CALLBACK** 0x01
- **#define NUM_BIAS_VOLTAGE** 20
- **#define pt_posH** 0
- **#define pt_negH** 1
- **#define pt_posRG** 2
- **#define pt_negRG** 3
- **#define pt_posSW** 4
- **#define pt_negSW** 5
- **#define pt_posV** 6
- **#define pt_negV** 7
- **#define pt_posTG** 8
- **#define pt_negTG** 9
- **#define pt_posVF** 10
- **#define pt_negVF** 11
- **#define pt_NEDGE** 12
- **#define pt_OTG** 13
- **#define pt_VDDR** 14
- **#define pt_VDD_OUT** 15
- **#define pt_BUF_Base** 16

- `#define pt_BUF_Delta 17`
- `#define pt_Spare1 18`
- `#define pt_Spare2 19`
- `#define DEBUG_PRINT(fmt,...) if(_debug_print_flag) { fprintf(stderr, "%s:%d:%s(): " fmt, __FILE__, __LINE__, __func__, __VA_ARGS__); }`
- `#define DEBUG_COMMENT(fmt) if(_debug_print_flag) { fprintf(stderr, "%s:%d:%s(): " fmt, __FILE__, __LINE__, __func__); }`
- `#define ERROR_COMMENT(fmt) if(_error_print_flag) { fprintf(stderr, "%s:%d:%s(): " fmt, __FILE__, __LINE__, __func__); }`
- `#define ERROR_PRINT(fmt,...) if(_error_print_flag) { fprintf(stderr, "%s:%d:%s(): " fmt, __FILE__, __LINE__, __func__, __VA_ARGS__); }`
- `#define CIN_CONFIG_MAX_STRING 256`
- `#define CIN_CONFIG_MAX_DATA 5000`
- `#define FIFO_MAX_READERS 10`

Typedefs

- `typedef struct cin_ctl_config cin_ctl_config_t`
- `typedef struct cin_ctl_listener cin_ctl_listener_t`
- `typedef struct cin_port cin_port_t`
- `typedef struct cin_ctl cin_ctl_t`
- `typedef struct cin_data_frame cin_data_frame_t`
- `typedef struct cin_data_stats cin_data_stats_t`
- `typedef struct cin_data_threads cin_data_threads_t`
- `typedef struct cin_data_callbacks cin_data_callbacks_t`
- `typedef struct cin_data cin_data_t`
- `typedef void(* cin_data_callback)(cin_data_frame_t *)`
- `typedef struct cin_ctl_id cin_ctl_id_t`
- `typedef struct cin_ctl_pwr_val cin_ctl_pwr_val_t`

Functions

- `void cin_set_debug_print(int debug)`
- `void cin_set_error_print(int error)`
- `void cin_report(FILE *fp, int details)`
- `int cin_ctl_init(cin_ctl_t *cin, const char *ipaddr, uint16_t oport, uint16_t iport, uint16_t soport, uint16_t siport)`
- `int cin_ctl_destroy(cin_ctl_t *cin)`
- `int cin_ctl_read(cin_ctl_t *cin, uint16_t reg, uint16_t *val)`
- `int cin_ctl_write(cin_ctl_t *cin, uint16_t reg, uint16_t val, int wait)`
- `int cin_ctl_stream_write(cin_ctl_t *cin, char *val, int size)`
- `int cin_ctl_write_with_readback(cin_ctl_t *cin, uint16_t reg, uint16_t val)`
- `int cin_ctl_pwr(cin_ctl_t *cin, int pwr)`
- `int cin_ctl_fp_pwr(cin_ctl_t *cin, int pwr)`
- `int cin_ctl_fo_test_pattern(cin_ctl_t *cin, int on_off)`
- `int cin_ctl_load_config(cin_ctl_t *cin, char *filename)`
- `int cin_ctl_load_firmware(cin_ctl_t *cin, char *filename)`
- `int cin_ctl_set_fclk(cin_ctl_t *cin, int clkfreq)`
- `int cin_ctl_get_fclk(cin_ctl_t *cin, int *clkfreq)`
- `int cin_ctl_freeze_dco(cin_ctl_t *cin, int freeze)`
- `int cin_ctl_get_cfg_fpga_status(cin_ctl_t *cin, uint16_t *_val)`
- `int cin_ctl_get_id(cin_ctl_t *cin, cin_ctl_id_t *_val)`
- `void cin_ctl_display_id(FILE *out, cin_ctl_id_t val)`
- `void cin_ctl_display_fpga_status(FILE *out, uint16_t val)`

- int **cin_ctl_get_dcm_status** ([cin_ctl_t](#) *cin, uint16_t *_val)
- void **cin_ctl_display_dcm_status** (FILE *out, uint16_t *_val)
- double **cin_ctl_current_calc** (uint16_t val)
- int **cin_ctl_get_power_status** ([cin_ctl_t](#) *cin, int full, int *pwr, [cin_ctl_pwr_mon_t](#) *values)
- void **cin_ctl_display_pwr** (FILE *out, [cin_ctl_pwr_mon_t](#) *values)
- void **cin_ctl_display_pwr_line** (FILE *out, const char *msg, [cin_ctl_pwr_val_t](#) val)
- int **cin_ctl_calc_vi_status** ([cin_ctl_t](#) *cin, uint16_t vreg, uint16_t ireg, double vfact, [cin_ctl_pwr_val_t](#) *vi)
- int **cin_ctl_get_camera_pwr** ([cin_ctl_t](#) *cin, int *val)
- int **cin_ctl_set_camera_pwr** ([cin_ctl_t](#) *cin, int val)
- int **cin_ctl_set_bias** ([cin_ctl_t](#) *cin, int val)
- int **cin_ctl_get_bias** ([cin_ctl_t](#) *cin, int *val)
- int **cin_ctl_set_clocks** ([cin_ctl_t](#) *cin, int val)
- int **cin_ctl_get_clocks** ([cin_ctl_t](#) *cin, int *val)
- int **cin_ctl_set_trigger** ([cin_ctl_t](#) *cin, int val)
- int **cin_ctl_get_trigger** ([cin_ctl_t](#) *cin, int *val)
- int **cin_ctl_set_focus** ([cin_ctl_t](#) *cin, int val)
- int **cin_ctl_get_focus** ([cin_ctl_t](#) *cin, int *val)
- int **cin_ctl_get_triggering** ([cin_ctl_t](#) *cin, int *trigger)
- int **cin_ctl_int_trigger_start** ([cin_ctl_t](#) *cin, int nimages)
- int **cin_ctl_int_trigger_stop** ([cin_ctl_t](#) *cin)
- int **cin_ctl_ext_trigger_start** ([cin_ctl_t](#) *cin, int trigger_mode)
- int **cin_ctl_ext_trigger_stop** ([cin_ctl_t](#) *cin)
- int **cin_ctl_set_exposure_time** ([cin_ctl_t](#) *cin, float e_time)
- int **cin_ctl_set_trigger_delay** ([cin_ctl_t](#) *cin, float t_time)
- int **cin_ctl_set_cycle_time** ([cin_ctl_t](#) *cin, float ftime)
- int **cin_ctl_frame_count_reset** ([cin_ctl_t](#) *cin)
- int **cin_ctl_set_mux** ([cin_ctl_t](#) *cin, int setting)
- int **cin_ctl_get_mux** ([cin_ctl_t](#) *cin, int *setting)
- int **cin_ctl_set_fcric_gain** ([cin_ctl_t](#) *cin, int gain)
- int **cin_ctl_set_fabric_address** ([cin_ctl_t](#) *cin, char *ip)
- int **cin_ctl_reg_dump** ([cin_ctl_t](#) *cin, FILE *fp)
- int **cin_ctl_get_bias_voltages** ([cin_ctl_t](#) *cin, float *voltage)
- int **cin_ctl_set_bias_voltages** ([cin_ctl_t](#) *cin, float *voltage)
- int **cin_ctl_set_fcric_clamp** ([cin_ctl_t](#) *cin, int clamp)
- int **cin_config_read_file** ([cin_ctl_t](#) *cin, const char *file)
- int **cin_data_init** ([cin_data_t](#) *cin, int mode, int packet_buffer_len, int frame_buffer_len, char *ipaddr, uint16_t port, char *cin_ipaddr, uint16_t [cin_port](#), int rcvbuf, cin_data_callback push_callback, cin_data_callback pop_callback, void *usr_ptr)
- void **cin_data_wait_for_threads** ([cin_data_t](#) *cin)
- void **cin_data_stop_threads** ([cin_data_t](#) *cin)
- void **cin_data_framestore_trigger** ([cin_data_t](#) *cin, int count)
- void **cin_data_framestore_skip** ([cin_data_t](#) *cin, int count)
- int **cin_data_get_framestore_counter** ([cin_data_t](#) *cin)
- void **cin_data_framestore_disable** ([cin_data_t](#) *cin)
- void **cin_data_framestore_trigger_enable** ([cin_data_t](#) *cin)
- struct [cin_data_frame](#) * **cin_data_get_next_frame** ([cin_data_t](#) *cin)
- void **cin_data_release_frame** ([cin_data_t](#) *cin, int free_mem)
- struct [cin_data_frame](#) * **cin_data_get_buffered_frame** (void)
- void **cin_data_release_buffered_frame** (void)
- void **cin_data_compute_stats** ([cin_data_t](#) *cin, [cin_data_stats_t](#) *stats)
- void **cin_data_show_stats** (FILE *fp, [cin_data_stats_t](#) stats)
- void **cin_data_reset_stats** ([cin_data_t](#) *cin)
- int **cin_data_set_descramble_params** ([cin_data_t](#) *cin, int rows, int overscan)
- void **cin_data_get_descramble_params** ([cin_data_t](#) *cin, int *rows, int *overscan, int *xsize, int *ysize)

Variables

- const char * **cin_build_git_time**
- const char * **cin_build_git_sha**
- const char * **cin_build_version**
- int **_debug_print_flag**
- int **_error_print_flag**

6.1.1 Detailed Description

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6.1.2 LICENSE

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6.1.3 DESCRIPTION

header file for CIN communications

6.1.4 Function Documentation

6.1.4.1 void cin_data_framestore_disable (cin_data_t * cin)

Disable the framestore modes

This function disables the framestore modes (software trigger and skip). If the camera is hardware triggering then the images will start to be processed.

Parameters

<i>cin</i>	Handle to the cin library
------------	---------------------------

6.1.4.2 void cin_data_framestore_skip (cin_data_t * cin, int count)

Enable framestore skip mode

Enable the framestore skip mode. This function should be called before hardware triggering the camera. This causes the data processing to skip

Parameters

<i>count</i>	frames from the first images to be read. This is usually done to stop the first few frames from being over exposed.
<i>cin</i>	handle to the cin_data library

6.1.4.3 void cin_data_framestore_trigger (cin_data_t * cin, int count)

Send a framestore (software) trigger

Send a software trigger to the CIN by timestamping the request time and allow images to be processed when recieved after this time. The count option sets the number of frames to trigger. A value of -1 indicated that the trigger should not count images but run indefinitely after the trigger has occurred.

Parameters

<i>cin</i>	handle to the cin_data library
<i>count</i>	number of frames to trigger

6.1.4.4 void cin_data_framestore_trigger_enable (cin_data_t * cin)

Enable the framestore trigger mode

This function enables the framestore trigger mode. It cases the images to not be processed pending a call to the function to (software) trigger the camera.

Parameters

<i>cin</i>	Handle to the cin library
------------	---------------------------

6.1.4.5 int cin_data_get_framestore_counter (cin_data_t * cin)

Get the value of the framestore counter

Return the number of frames in the framestore counter. In trigger mode, this returns the number of frames to go. In skip mode, this returns the number of frames that have to be skipped.

Parameters

<i>cin</i>	handle to the cin_data library
------------	--

Returns

Number of frames to go in trigger

6.1.4.6 `int cin_data_init (cin_data_t * cin, int mode, int packet_buffer_len, int frame_buffer_len, char * ipaddr, uint16_t port, char * cin_ipaddr, uint16_t cin_port, int rcvbuf, cin_data_callback push_callback, cin_data_callback pop_callback, void * usr_ptr)`

Initialize the cin data library

Initialize the data handling routines and start the threads for listening. mode should be set for the desired output. The packet_buffer_len is the length of the packet FIFO in number of packets. The frame_buffer_len is the number of data frames to buffer.

Parameters

<i>cin</i>	Handle to cin data library
------------	----------------------------

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