

libcin

Generated by Doxygen 1.8.6

Thu Jul 6 2017 12:00:23

Contents

1	Module Index	1
1.1	Modules	1
2	Class Index	3
2.1	Class List	3
3	File Index	5
3.1	File List	5
4	Module Documentation	7
4.1	Cin Control Routines	7
4.1.1	Detailed Description	8
4.1.2	Function Documentation	8
4.1.2.1	cin_ctl_destroy	8
4.1.2.2	cin_ctl_init	8
4.1.2.3	cin_ctl_read	9
4.1.2.4	cin_ctl_stream_write	10
4.1.2.5	cin_ctl_write	10
4.1.2.6	cin_ctl_write_with_readback	10
4.2	CIN Data Routines	11
5	Class Documentation	13
5.1	cin_ctl Struct Reference	13
5.2	cin_ctl_config Struct Reference	13
5.3	cin_ctl_id Struct Reference	14
5.4	cin_ctl_listener Struct Reference	14
5.5	cin_ctl_pwr_mon_t Struct Reference	14
5.6	cin_ctl_pwr_val Struct Reference	14
5.7	cin_data Struct Reference	15
5.8	cin_data_callbacks Struct Reference	15
5.9	cin_data_frame Struct Reference	16
5.10	cin_data_packet Struct Reference	16
5.11	cin_data_proc Struct Reference	16

5.12	cin_data_stats Struct Reference	16
5.13	cin_data_threads Struct Reference	17
5.14	cin_map_t Struct Reference	17
5.15	cin_port Struct Reference	17
5.16	descramble_map_t Struct Reference	18
5.17	fifo Struct Reference	18
6	File Documentation	19
6.1	src/cin.h File Reference	19
6.1.1	Detailed Description	24
6.1.2	LICENSE	24
6.1.3	DESCRIPTION	24
6.1.4	Function Documentation	24
6.1.4.1	cin_data_framestore_trigger	24
6.1.4.2	cin_data_init	25
	Index	26

Chapter 1

Module Index

1.1 Modules

Here is a list of all modules:

Cin Control Routines	7
CIN Data Routines	11

Chapter 2

Class Index

2.1 Class List

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

cin_ctl	13
cin_ctl_config	13
cin_ctl_id	14
cin_ctl_listener	14
cin_ctl_pwr_mon_t	14
cin_ctl_pwr_val	14
cin_data	15
cin_data_callbacks	15
cin_data_frame	16
cin_data_packet	16
cin_data_proc	16
cin_data_stats	16
cin_data_threads	17
cin_map_t	17
cin_port	17
descramble_map_t	18
fifo	18

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 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)

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 Routines

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`
- `#define CIN_DATA_FRAMESTORE_NONE 0`
- `#define CIN_DATA_FRAMESTORE_TRIGGER 1`
- `#define CIN_DATA_FRAMESTORE_SKIP 2`

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)
- void **cin_data_set_framestore_counter** ([cin_data_t](#) *cin, int count)
- void **cin_data_get_framestore_counter** ([cin_data_t](#) *cin, int *count)
- void **cin_data_set_framestore_mode** ([cin_data_t](#) *cin, int mode)
- void **cin_data_get_framestore_mode** ([cin_data_t](#) *cin, int *mode)
- 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

Author

Stuart B. Wilkins swilkins@bnl.gov

6.1.2 LICENSE

Copyright (c) 2014, Stuart B. Wilkins All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The views and conclusions contained in the software and documentation are those of the authors and should not be interpreted as representing official policies, either expressed or implied, of the FreeBSD Project.

6.1.3 DESCRIPTION

header file for CIN communications

6.1.4 Function Documentation

6.1.4.1 void cin_data_framestore_trigger (cin_data_t * cin)

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 function is enabled by setting the framestore mode to CIN_DATA_FRAMESTORE_TRIGGER.

Parameters

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

See Also

`cin_data_set_framestore_mode`, `cin_data_set_framestore_counter`

6.1.4.2 `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
------------	----------------------------

Index

- CIN Data Routines, [11](#)
- Cin Control Routines, [7](#)
 - cin_ctl_destroy, [8](#)
 - cin_ctl_init, [8](#)
 - cin_ctl_read, [8](#)
 - cin_ctl_stream_write, [10](#)
 - cin_ctl_write, [10](#)
 - cin_ctl_write_with_readback, [10](#)
- cin.h
 - cin_data_framestore_trigger, [24](#)
 - cin_data_init, [25](#)
- cin_ctl, [13](#)
- cin_ctl_config, [13](#)
- cin_ctl_destroy
 - Cin Control Routines, [8](#)
- cin_ctl_id, [14](#)
- cin_ctl_init
 - Cin Control Routines, [8](#)
- cin_ctl_listener, [14](#)
- cin_ctl_pwr_mon_t, [14](#)
- cin_ctl_pwr_val, [14](#)
- cin_ctl_read
 - Cin Control Routines, [8](#)
- cin_ctl_stream_write
 - Cin Control Routines, [10](#)
- cin_ctl_write
 - Cin Control Routines, [10](#)
- cin_ctl_write_with_readback
 - Cin Control Routines, [10](#)
- cin_data, [15](#)
- cin_data_callbacks, [15](#)
- cin_data_frame, [16](#)
- cin_data_framestore_trigger
 - cin.h, [24](#)
- cin_data_init
 - cin.h, [25](#)
- cin_data_packet, [16](#)
- cin_data_proc, [16](#)
- cin_data_stats, [16](#)
- cin_data_threads, [17](#)
- cin_map_t, [17](#)
- cin_port, [17](#)
- descramble_map_t, [18](#)
- fifo, [18](#)
- src/cin.h, [19](#)