libgpiod

2.0-devel

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Contents

Chapter 1

libgpiod public API

This is the complete documentation of the public API made available to users of libgpiod.

The API is logically split into several parts such as: GPIO chip & line operators, GPIO events handling etc.

General note on error handling: all routines exported by libgpiod set errno to one of the error values defined in errno.h upon failure. The way of notifying the caller that an error occurred varies between functions, but in general a function that returns an int, returns -1 on error, while a function returning a pointer bails out on error condition by returning a NULL pointer.

Chapter 2

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Module Documentation

5.1 Common helper macros

Commonly used utility macros.

Macros

- #define GPIOD_API __attribute__((visibility("default")))
  Makes symbol visible.
- #define GPIOD_BIT(nr) (1UL << (nr))
  Shift 1 by given offset.

5.1.1 Detailed Description

Commonly used utility macros.

5.1.2 Macro Definition Documentation

5.1.2.1 GPIOD_BIT

```
#define GPIOD_BIT(
              nr ) (1UL << (nr))
```

Shift 1 by given offset.

Parameters

nr	Bit position.

Returns

1 shifted by nr.

Definition at line 57 of file gpiod.h.

5.2 GPIO chip operations

Functions and data structures dealing with GPIO chips.

Functions

- bool gpiod_is_gpiochip_device (const char *path) GPIOD_API

  Check if the file pointed to by path is a GPIO chip character device.
- struct gpiod_chip * gpiod_chip_open (const char *path) GPIOD_API

  Open a gpiochip by path.
- void gpiod_chip_close (struct gpiod_chip *chip) GPIOD_API

  Close a GPIO chip handle and release all allocated resources.
- const char * gpiod_chip_name (struct gpiod_chip *chip) GPIOD_API

  Get the GPIO chip name as represented in the kernel.
- const char * gpiod_chip_label (struct gpiod_chip *chip) GPIOD_API

  Get the GPIO chip label as represented in the kernel.
- unsigned int gpiod_chip_num_lines (struct gpiod_chip *chip) GPIOD_API

  Get the number of GPIO lines exposed by this chip.
- struct gpiod_line * gpiod_chip_get_line (struct gpiod_chip *chip, unsigned int offset) GPIOD_API

  Get the handle to the GPIO line at given offset.
- struct gpiod_line_bulk * gpiod_chip_get_lines (struct gpiod_chip *chip, unsigned int *offsets, unsigned int num_offsets) GPIOD_API

  Retrieve a set of lines and store them in a line bulk object.
- struct gpiod_line_bulk * gpiod_chip_get_all_lines (struct gpiod_chip *chip) GPIOD_API

  Retrieve all lines exposed by a chip and store them in a bulk object.
- struct gpiod_line_bulk * gpiod_chip_find_line (struct gpiod_chip *chip, const char *name) GPIOD_API

  Find all GPIO lines by name among lines exposed by this GPIO chip.
- struct gpiod_line * gpiod_chip_find_line_unique (struct gpiod_chip *chip, const char *name) GPIOD_API

  Find a unique line by name among lines exposed by this GPIO chip.

5.2.1 Detailed Description

Functions and data structures dealing with GPIO chips.

5.2.2 Function Documentation

5.2.2.1 gpiod_chip_close()

```
void gpiod_chip_close (
            struct gpiod_chip * chip )
```

Close a GPIO chip handle and release all allocated resources.

Parameters

chip	The GPIO chip object.

5.2.2.2 gpiod_chip_find_line()

```
struct gpiod_line_bulk* gpiod_chip_find_line (
            struct gpiod_chip * chip,
            const char * name )
```

Find all GPIO lines by name among lines exposed by this GPIO chip.

Parameters

chip	The GPIO chip object.
name	GPIO line name to look for.

Returns

New line bulk object containing all matching lines or NULL on error.

If no line with given name is associated with this chip, the function sets errno to ENOENT.

5.2.2.3 gpiod_chip_find_line_unique()

```
struct gpiod_line* gpiod_chip_find_line_unique (
            struct gpiod_chip * chip,
            const char * name )
```

Find a unique line by name among lines exposed by this GPIO chip.

Parameters

chip	The GPIO chip object.
name	Name of the GPIO line.

Returns

Pointer to the GPIO line handle or NULL if the line could not be found or an error occurred.

If no line with given name is associated with this chip, the function sets errno to ENOENT. If more than one line with given name is associated with this chip, the function sets errno to ERANGE.

5.2.2.4 gpiod_chip_get_all_lines()

```
struct gpiod_line_bulk* gpiod_chip_get_all_lines (
            struct gpiod_chip * chip )
```

Retrieve all lines exposed by a chip and store them in a bulk object.

Parameters

chip	The GPIO chip object.

Returns

New line bulk object or NULL on error.

5.2.2.5 gpiod_chip_get_line()

```
struct gpiod_line* gpiod_chip_get_line (
            struct gpiod_chip * chip,
            unsigned int offset )
```

Get the handle to the GPIO line at given offset.

Parameters

chip	The GPIO chip object.
offset	The offset of the GPIO line.

Returns

Pointer to the GPIO line handle or NULL if an error occured.

5.2.2.6 gpiod_chip_get_lines()

```
struct gpiod_line_bulk* gpiod_chip_get_lines (
            struct gpiod_chip * chip,
            unsigned int * offsets,
            unsigned int num_offsets )
```

Retrieve a set of lines and store them in a line bulk object.

Parameters

chip	The GPIO chip object.
offsets	Array of offsets of lines to retrieve.
num_offsets	Number of lines to retrieve.

Returns

New line bulk object or NULL on error.

5.2.2.7 gpiod_chip_label()

```
const char* gpiod_chip_label (
            struct gpiod_chip * chip )
```

Get the GPIO chip label as represented in the kernel.

Parameters

chip	The GPIO chip object.

Returns

Pointer to a human-readable string containing the chip label.

5.2.2.8 gpiod_chip_name()

```
const char* gpiod_chip_name (
            struct gpiod_chip * chip )
```

Get the GPIO chip name as represented in the kernel.

Parameters

chip	The GPIO chip object.

Returns

Pointer to a human-readable string containing the chip name.

5.2.2.9 gpiod_chip_num_lines()

```
unsigned int gpiod_chip_num_lines (
            struct gpiod_chip * chip )
```

Get the number of GPIO lines exposed by this chip.

Parameters

chip	The GPIO chip object.

Returns

Number of GPIO lines.

5.2.2.10 gpiod_chip_open()

```
struct gpiod_chip* gpiod_chip_open (
            const char * path )
```

Open a gpiochip by path.

Parameters

path	Path to the gpiochip device file.

Returns

GPIO chip handle or NULL if an error occurred.

5.2.2.11 gpiod_is_gpiochip_device()

```
bool gpiod_is_gpiochip_device (
            const char * path )
```

Check if the file pointed to by path is a GPIO chip character device.

Parameters

path	Path to check.

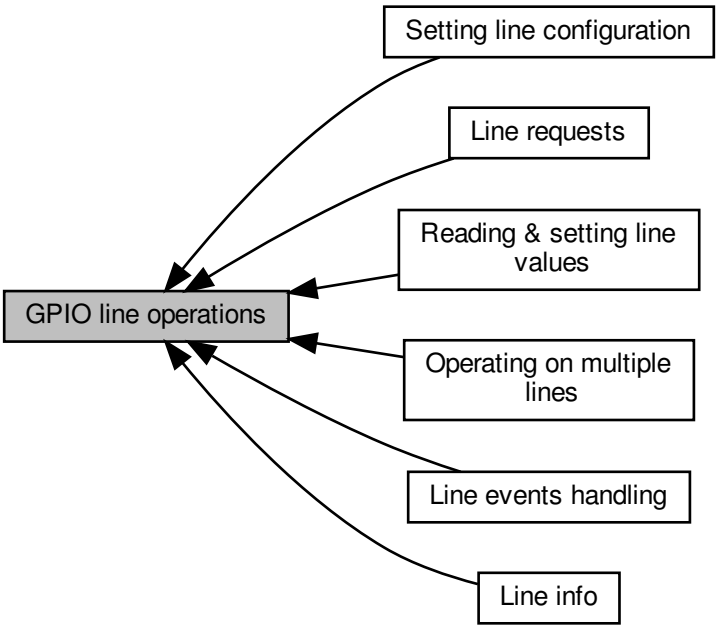
Returns

True if the file exists and is a GPIO chip character device or a symbolic link to it.

5.3 GPIO line operations

Functions and data structures dealing with GPIO lines.

Collaboration diagram for GPIO line operations:



Modules

- Operating on multiple lines

  Convenience data structures and helper functions for storing and operating on multiple lines at once.
- Line info

  Definitions and functions for retrieving kernel information about both requested and free lines.
- Line requests

  Interface for requesting GPIO lines from userspace for both values and events.
- Reading & setting line values

  Functions allowing to read and set GPIO line values for single lines and in bulk.
- Setting line configuration

  Functions allowing modification of config options of GPIO lines requested from user-space.
- Line events handling

  Structures and functions allowing to poll lines for events and read them, both for individual lines as well as in bulk.

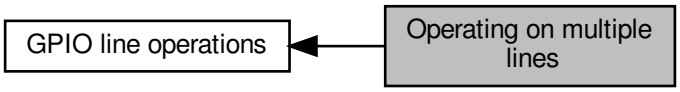
5.3.1 Detailed Description

Functions and data structures dealing with GPIO lines.

5.4 Operating on multiple lines

Convenience data structures and helper functions for storing and operating on multiple lines at once.

Collaboration diagram for Operating on multiple lines:



Typedefs

- typedef int(∗ gpiod_line_bulk_foreach_cb) (struct gpiod_line ∗, void ∗)

  Signature of the callback passed to gpiod_line_bulk_foreach_line.

Enumerations

- enum { GPIOD_LINE_BULK_CB_NEXT = 0, **GPIOD_LINE_BULK_CB_STOP** }

  Values returned by the callback passed to gpiod_line_bulk_foreach_line.

Functions

- struct gpiod_line_bulk ∗ gpiod_line_bulk_new (unsigned int max_lines) GPIOD_API

  Allocate and initialize a new line bulk object.
- void gpiod_line_bulk_reset (struct gpiod_line_bulk ∗bulk) GPIOD_API

  Reset a bulk object.
- void gpiod_line_bulk_free (struct gpiod_line_bulk ∗bulk) GPIOD_API

  Release all resources allocated for this bulk object.
- int gpiod_line_bulk_add_line (struct gpiod_line_bulk ∗bulk, struct gpiod_line ∗line) GPIOD_API

  Add a single line to a GPIO bulk object.
- struct gpiod_line ∗ gpiod_line_bulk_get_line (struct gpiod_line_bulk ∗bulk, unsigned int index) GPIOD_API

  Retrieve the line handle from a line bulk object at given index.
- unsigned int gpiod_line_bulk_num_lines (struct gpiod_line_bulk ∗bulk) GPIOD_API

  Retrieve the number of GPIO lines held by this line bulk object.
- void gpiod_line_bulk_foreach_line (struct gpiod_line_bulk ∗bulk, gpiod_line_bulk_foreach_cb func, void ∗data) GPIOD_API

  Iterate over all lines held by this bulk object.

5.4.1 Detailed Description

Convenience data structures and helper functions for storing and operating on multiple lines at once.

5.4.2 Typedef Documentation

5.4.2.1 gpiod_line_bulk_foreach_cb

```
typedef int(* gpiod_line_bulk_foreach_cb) (struct gpiod_line *, void *)
```

Signature of the callback passed to gpiod_line_bulk_foreach_line.

Takes the current line and additional user data as arguments.

Definition at line 247 of file gpiod.h.

5.4.3 Enumeration Type Documentation

5.4.3.1 anonymous enum

```
anonymous enum
```

Values returned by the callback passed to gpiod_line_bulk_foreach_line.

Enumerator

GPIOD_LINE_BULK_CB_NEXT	Continue the loop. Stop the loop.

Definition at line 235 of file gpiod.h.

5.4.4 Function Documentation

5.4.4.1 gpiod_line_bulk_add_line()

```
int gpiod_line_bulk_add_line (
            struct gpiod_line_bulk * bulk,
            struct gpiod_line * line )
```

Add a single line to a GPIO bulk object.

Parameters

bulk	Line bulk object.
line	Line to add.

Returns

0 on success, -1 on error.

Note

The line is added at the next free bulk index.

The function can fail if this bulk already holds its maximum amount of lines or if the added line is associated with a different chip than all the other lines already held by this object.

5.4.4.2 gpiod_line_bulk_foreach_line()

```
void gpiod_line_bulk_foreach_line (
             struct gpiod_line_bulk * bulk,
             gpiod_line_bulk_foreach_cb func,
             void * data )
```

Iterate over all lines held by this bulk object.

Parameters

bulk	Bulk object to iterate over.
func	Callback to be called for each line.
data	User data pointer that is passed to the callback.

5.4.4.3 gpiod_line_bulk_free()

```
void gpiod_line_bulk_free (
             struct gpiod_line_bulk * bulk )
```

Release all resources allocated for this bulk object.

Parameters

bulk	Bulk object to free.

5.4.4.4 gpiod_line_bulk_get_line()

```
struct gpiod_line* gpiod_line_bulk_get_line (
             struct gpiod_line_bulk * bulk,
             unsigned int index )
```

Retrieve the line handle from a line bulk object at given index.

Parameters

bulk	Line bulk object.
index	Index of the line to retrieve.

Returns

Line handle at given index or NULL if index is greater or equal to the number of lines this bulk can hold.

5.4.4.5 gpiod_line_bulk_new()

```
struct gpiod_line_bulk* gpiod_line_bulk_new (
              unsigned int max_lines )
```

Allocate and initialize a new line bulk object.

Parameters

max_lines	Maximum number of lines this object can hold.

Returns

New line bulk object or NULL on error.

5.4.4.6 gpiod_line_bulk_num_lines()

```
unsigned int gpiod_line_bulk_num_lines (
              struct gpiod_line_bulk * bulk )
```

Retrieve the number of GPIO lines held by this line bulk object.

Parameters

bulk	Line bulk object.

Returns

Number of lines held by this line bulk.

5.4.4.7 gpiod_line_bulk_reset()

```
void gpiod_line_bulk_reset (
            struct gpiod_line_bulk * bulk )
```

Reset a bulk object.

Remove all lines and set size to 0.

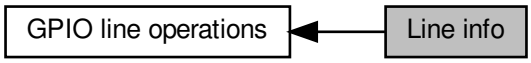
Parameters

bulk	Bulk object to reset.

5.5 Line info

Definitions and functions for retrieving kernel information about both requested and free lines.

Collaboration diagram for Line info:



Enumerations

- enum { GPIOD_LINE_DIRECTION_INPUT = 1, GPIOD_LINE_DIRECTION_OUTPUT }

  Possible direction settings.
- enum { GPIOD_LINE_DRIVE_PUSH_PULL = 1, GPIOD_LINE_DRIVE_OPEN_DRAIN, GPIOD_LINE_DRIVE_OPEN_SOURCE }

  Possible drive settings.
- enum { GPIOD_LINE_BIAS_UNKNOWN = 1, GPIOD_LINE_BIAS_DISABLED, GPIOD_LINE_BIAS_PULL_UP, GPIOD_LINE_BIAS_PULL_DOWN }

  Possible internal bias settings.

Functions

- unsigned int gpiod_line_offset (struct gpiod_line *line) GPIOD_API

  Read the GPIO line offset.
- const char * gpiod_line_name (struct gpiod_line *line) GPIOD_API

  Read the GPIO line name.
- const char * gpiod_line_consumer (struct gpiod_line *line) GPIOD_API

  Read the GPIO line consumer name.
- int gpiod_line_direction (struct gpiod_line *line) GPIOD_API

  Read the GPIO line direction setting.
- bool gpiod_line_is_active_low (struct gpiod_line *line) GPIOD_API

  Check if the signal of this line is inverted.
- int gpiod_line_bias (struct gpiod_line *line) GPIOD_API

  Read the GPIO line bias setting.
- bool gpiod_line_is_used (struct gpiod_line *line) GPIOD_API

  Check if the line is currently in use.
- int gpiod_line_drive (struct gpiod_line *line) GPIOD_API

  Read the GPIO line drive setting.
- int gpiod_line_update (struct gpiod_line *line) GPIOD_API

  Re-read the line info.
- struct gpiod_chip * gpiod_line_get_chip (struct gpiod_line *line) GPIOD_API

  Get the handle to the GPIO chip controlling this line.

5.5.1 Detailed Description

Definitions and functions for retrieving kernel information about both requested and free lines.

5.5.2 Enumeration Type Documentation

5.5.2.1 anonymous enum

```
anonymous enum
```

Possible direction settings.

Enumerator

GPIOD_LINE_DIRECTION_INPUT	Direction is input - we're reading the state of a GPIO line.
GPIOD_LINE_DIRECTION_OUTPUT	Direction is output - we're driving the GPIO line.

Definition at line 272 of file gpiod.h.

5.5.2.2 anonymous enum

```
anonymous enum
```

Possible drive settings.

Enumerator

GPIOD_LINE_DRIVE_PUSH_PULL	Drive setting is push-pull.
GPIOD_LINE_DRIVE_OPEN_DRAIN	Line output is open-drain.
GPIOD_LINE_DRIVE_OPEN_SOURCE	Line output is open-source.

Definition at line 282 of file gpiod.h.

5.5.2.3 anonymous enum

```
anonymous enum
```

Possible internal bias settings.

Enumerator

GPIOD_LINE_BIAS_UNKNOWN	The internal bias state is unknown.
GPIOD_LINE_BIAS_DISABLED	The internal bias is disabled.
GPIOD_LINE_BIAS_PULL_UP	The internal pull-up bias is enabled.
GPIOD_LINE_BIAS_PULL_DOWN	The internal pull-down bias is enabled.

Definition at line 294 of file gpiod.h.

5.5.3 Function Documentation

5.5.3.1 gpiod_line_bias()

```
int gpiod_line_bias (
            struct gpiod_line * line )
```

Read the GPIO line bias setting.

Parameters

line	GPIO line object.

Returns

Returns GPIOD_LINE_BIAS_PULL_UP, GPIOD_LINE_BIAS_PULL_DOWN, GPIOD_LINE_BIAS_DISABLE or GPIOD_LINE_BIAS_UNKNOWN.

5.5.3.2 gpiod_line_consumer()

```
const char* gpiod_line_consumer (
            struct gpiod_line * line )
```

Read the GPIO line consumer name.

Parameters

line	GPIO line object.

Returns

Name of the GPIO consumer name as it is represented in the kernel. This routine returns a pointer to a null-terminated string or NULL if the line is not used.

5.5.3.3 gpiod_line_direction()

```
int gpiod_line_direction (
            struct gpiod_line * line )
```

Read the GPIO line direction setting.

Parameters

line	GPIO line object.

Returns

Returns GPIOD_LINE_DIRECTION_INPUT or GPIOD_LINE_DIRECTION_OUTPUT.

5.5.3.4 gpiod_line_drive()

```
int gpiod_line_drive (
            struct gpiod_line * line )
```

Read the GPIO line drive setting.

Parameters

line	GPIO line object.

Returns

Returns GPIOD_LINE_DRIVE_PUSH_PULL, GPIOD_LINE_DRIVE_OPEN_DRAIN or GPIOD_LINE_DRI↩ VE_OPEN_SOURCE.

5.5.3.5 gpiod_line_get_chip()

```
struct gpiod_chip* gpiod_line_get_chip (
            struct gpiod_line * line )
```

Get the handle to the GPIO chip controlling this line.

Parameters

line	The GPIO line object.

Returns

Pointer to the GPIO chip handle controlling this line.

5.5.3.6 gpiod_line_is_active_low()

```
bool gpiod_line_is_active_low (
            struct gpiod_line * line )
```

Check if the signal of this line is inverted.

Parameters

line	GPIO line object.

Returns

True if this line is "active-low", false otherwise.

5.5.3.7 gpiod_line_is_used()

```
bool gpiod_line_is_used (
            struct gpiod_line * line )
```

Check if the line is currently in use.

Parameters

line	GPIO line object.

Returns

True if the line is in use, false otherwise.

The user space can't know exactly why a line is busy. It may have been requested by another process or hogged by the kernel. It only matters that the line is used and we can't request it.

5.5.3.8 gpiod_line_name()

```
const char* gpiod_line_name (
            struct gpiod_line * line )
```

Read the GPIO line name.

Parameters

line	GPIO line object.

Returns

Name of the GPIO line as it is represented in the kernel. This routine returns a pointer to a null-terminated string or NULL if the line is unnamed.

5.5.3.9 gpiod_line_offset()

```
unsigned int gpiod_line_offset (
              struct gpiod_line * line )
```

Read the GPIO line offset.

Parameters

line	GPIO line object.

Returns

Line offset.

5.5.3.10 gpiod_line_update()

```
int gpiod_line_update (
              struct gpiod_line * line )
```

Re-read the line info.

Parameters

line	GPIO line object.

Returns

0 if the operation succeeds. In case of an error this routine returns -1 and sets the last error number.

The line info is initially retrieved from the kernel by gpiod_chip_get_line() and is later re-read after every successful request. Users can use this function to manually re-read the line info when needed.

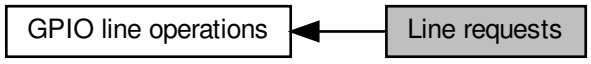
We currently have no mechanism provided by the kernel for keeping the line info synchronized and for the sake of speed and simplicity of this low-level library we don't want to re-read the line info automatically everytime a property is retrieved. Any daemon using this library must track the state of lines on its own and call this routine if needed.

The state of requested lines is kept synchronized (or rather cannot be changed by external agents while the ownership of the line is taken) so there's no need to call this function in that case.

5.6 Line requests

Interface for requesting GPIO lines from userspace for both values and events.

Collaboration diagram for Line requests:



Data Structures

- struct gpiod_line_request_config

  Structure holding configuration of a line request.

Enumerations

- enum {
  GPIOD_LINE_REQUEST_DIRECTION_AS_IS = 1, GPIOD_LINE_REQUEST_DIRECTION_INPUT, GPIOD_LINE_REQUEST_DIRECTION_OUTPUT, GPIOD_LINE_REQUEST_EVENT_FALLING_EDGE, GPIOD_LINE_REQUEST_EVENT_RISING_EDGE, GPIOD_LINE_REQUEST_EVENT_BOTH_EDGES }

  Available types of requests.
- enum {
  GPIOD_LINE_REQUEST_FLAG_OPEN_DRAIN = GPIOD_BIT(0), GPIOD_LINE_REQUEST_FLAG_OPEN_SOURCE = GPIOD_BIT(1), GPIOD_LINE_REQUEST_FLAG_ACTIVE_LOW = GPIOD_BIT(2), GPIOD_LINE_REQUEST_FLAG_BIAS_DISABLED = GPIOD_BIT(3), GPIOD_LINE_REQUEST_FLAG_BIAS_PULL_DOWN = GPIOD_BIT(4), GPIOD_LINE_REQUEST_FLAG_BIAS_PULL_UP = GPIOD_BIT(5) }

  Miscellaneous GPIO request flags.

Functions

- int gpiod_line_request (struct gpiod_line *line, const struct gpiod_line_request_config *config, int default_val) GPIOD_API

  Reserve a single line.
- int gpiod_line_request_input (struct gpiod_line *line, const char *consumer) GPIOD_API

  Reserve a single line, set the direction to input.
- int gpiod_line_request_output (struct gpiod_line *line, const char *consumer, int default_val) GPIOD_API

  Reserve a single line, set the direction to output.
- int gpiod_line_request_rising_edge_events (struct gpiod_line *line, const char *consumer) GPIOD_API

  Request rising edge event notifications on a single line.
- int gpiod_line_request_falling_edge_events (struct gpiod_line *line, const char *consumer) GPIOD_API

  Request falling edge event notifications on a single line.
- int gpiod_line_request_both_edges_events (struct gpiod_line *line, const char *consumer) GPIOD_API

Request all event type notifications on a single line.

- int gpiod_line_request_input_flags (struct gpiod_line *line, const char *consumer, int flags) GPIOD_API

  Reserve a single line, set the direction to input.

- int gpiod_line_request_output_flags (struct gpiod_line *line, const char *consumer, int flags, int default_val) GPIOD_API

  Reserve a single line, set the direction to output.

- int gpiod_line_request_rising_edge_events_flags (struct gpiod_line *line, const char *consumer, int flags) GPIOD_API

  Request rising edge event notifications on a single line.

- int gpiod_line_request_falling_edge_events_flags (struct gpiod_line *line, const char *consumer, int flags) GPIOD_API

  Request falling edge event notifications on a single line.

- int gpiod_line_request_both_edges_events_flags (struct gpiod_line *line, const char *consumer, int flags) GPIOD_API

  Request all event type notifications on a single line.

- int gpiod_line_request_bulk (struct gpiod_line_bulk *bulk, const struct gpiod_line_request_config *config, const int *default_vals) GPIOD_API

  Reserve a set of GPIO lines.

- int gpiod_line_request_bulk_input (struct gpiod_line_bulk *bulk, const char *consumer) GPIOD_API

  Reserve a set of GPIO lines, set the direction to input.

- int gpiod_line_request_bulk_output (struct gpiod_line_bulk *bulk, const char *consumer, const int *default_vals) GPIOD_API

  Reserve a set of GPIO lines, set the direction to output.

- int gpiod_line_request_bulk_rising_edge_events (struct gpiod_line_bulk *bulk, const char *consumer) GPIOD_API

  Request rising edge event notifications on a set of lines.

- int gpiod_line_request_bulk_falling_edge_events (struct gpiod_line_bulk *bulk, const char *consumer) GPIOD_API

  Request falling edge event notifications on a set of lines.

- int gpiod_line_request_bulk_both_edges_events (struct gpiod_line_bulk *bulk, const char *consumer) GPIOD_API

  Request all event type notifications on a set of lines.

- int gpiod_line_request_bulk_input_flags (struct gpiod_line_bulk *bulk, const char *consumer, int flags) GPIOD_API

  Reserve a set of GPIO lines, set the direction to input.

- int gpiod_line_request_bulk_output_flags (struct gpiod_line_bulk *bulk, const char *consumer, int flags, const int *default_vals) GPIOD_API

  Reserve a set of GPIO lines, set the direction to output.

- int gpiod_line_request_bulk_rising_edge_events_flags (struct gpiod_line_bulk *bulk, const char *consumer, int flags) GPIOD_API

  Request rising edge event notifications on a set of lines.

- int gpiod_line_request_bulk_falling_edge_events_flags (struct gpiod_line_bulk *bulk, const char *consumer, int flags) GPIOD_API

  Request falling edge event notifications on a set of lines.

- int gpiod_line_request_bulk_both_edges_events_flags (struct gpiod_line_bulk *bulk, const char *consumer, int flags) GPIOD_API

  Request all event type notifications on a set of lines.

- void gpiod_line_release (struct gpiod_line *line) GPIOD_API

  Release a previously reserved line.

- void gpiod_line_release_bulk (struct gpiod_line_bulk *bulk) GPIOD_API

  Release a set of previously reserved lines.

- bool gpiod_line_is_requested (struct gpiod_line *line) GPIOD_API

  Check if the calling user has ownership of this line.

- bool gpiod_line_is_free (struct gpiod_line *line) GPIOD_API

  Check if the calling user has neither requested ownership of this line nor configured any event notifications.

5.6.1 Detailed Description

Interface for requesting GPIO lines from userspace for both values and events.

5.6.2 Enumeration Type Documentation

5.6.2.1 anonymous enum

```
anonymous enum
```

Available types of requests.

Enumerator

GPIOD_LINE_REQUEST_DIRECTION_AS_IS	Request the line(s), but don't change current direction.
GPIOD_LINE_REQUEST_DIRECTION_INPUT	Request the line(s) for reading the GPIO line state.
GPIOD_LINE_REQUEST_DIRECTION_OUTPUT	Request the line(s) for setting the GPIO line state.
GPIOD_LINE_REQUEST_EVENT_FALLING_EDGE	Only watch falling edge events.
GPIOD_LINE_REQUEST_EVENT_RISING_EDGE	Only watch rising edge events.
GPIOD_LINE_REQUEST_EVENT_BOTH_EDGES	Monitor both types of events.

Definition at line 413 of file gpiod.h.

5.6.2.2 anonymous enum

```
anonymous enum
```

Miscellaneous GPIO request flags.

Enumerator

GPIOD_LINE_REQUEST_FLAG_OPEN_DRAIN	The line is an open-drain port.
GPIOD_LINE_REQUEST_FLAG_OPEN_SOURCE	The line is an open-source port.
GPIOD_LINE_REQUEST_FLAG_ACTIVE_LOW	The active state of the line is low (high is the default).
GPIOD_LINE_REQUEST_FLAG_BIAS_DISABLED	The line has neither either pull-up nor pull-down resistor.
GPIOD_LINE_REQUEST_FLAG_BIAS_PULL_DOWN	The line has pull-down resistor enabled.
GPIOD_LINE_REQUEST_FLAG_BIAS_PULL_UP	The line has pull-up resistor enabled.

Definition at line 431 of file gpiod.h.

5.6.3 Function Documentation

5.6.3.1 gpiod_line_is_free()

```
bool gpiod_line_is_free (
            struct gpiod_line * line )
```

Check if the calling user has neither requested ownership of this line nor configured any event notifications.

Parameters

line	GPIO line object.

Returns

True if given line is free, false otherwise.

5.6.3.2 gpiod_line_is_requested()

```
bool gpiod_line_is_requested (
            struct gpiod_line * line )
```

Check if the calling user has ownership of this line.

Parameters

line	GPIO line object.

Returns

True if given line was requested, false otherwise.

5.6.3.3 gpiod_line_release()

```
void gpiod_line_release (
            struct gpiod_line * line )
```

Release a previously reserved line.

Parameters

line	GPIO line object.

5.6.3.4 gpiod_line_release_bulk()

```
void gpiod_line_release_bulk (
            struct gpiod_line_bulk * bulk )
```

Release a set of previously reserved lines.

Parameters

bulk	Set of GPIO lines to release.

If the lines were not previously requested together, the behavior is undefined.

5.6.3.5 gpiod_line_request()

```
int gpiod_line_request (
            struct gpiod_line * line,
            const struct gpiod_line_request_config * config,
            int default_val )
```

Reserve a single line.

Parameters

line	GPIO line object.
config	Request options.
default_val	Initial line value - only relevant if we're setting the direction to output.

Returns

0 if the line was properly reserved. In case of an error this routine returns -1 and sets the last error number.

If this routine succeeds, the caller takes ownership of the GPIO line until it's released.

5.6.3.6 gpiod_line_request_both_edges_events()

```
int gpiod_line_request_both_edges_events (
            struct gpiod_line * line,
            const char * consumer )
```

Request all event type notifications on a single line.

Parameters

line	GPIO line object.
consumer	Name of the consumer.

Returns

0 if the operation succeeds, -1 on failure.

5.6.3.7 gpiod_line_request_both_edges_events_flags()

```
int gpiod_line_request_both_edges_events_flags (
            struct gpiod_line * line,
            const char * consumer,
            int flags )
```

Request all event type notifications on a single line.

Parameters

line	GPIO line object.
consumer	Name of the consumer.
flags	Additional request flags.

Returns

0 if the operation succeeds, -1 on failure.

5.6.3.8 gpiod_line_request_bulk()

```
int gpiod_line_request_bulk (
            struct gpiod_line_bulk * bulk,
            const struct gpiod_line_request_config * config,
            const int * default_vals )
```

Reserve a set of GPIO lines.

Parameters

bulk	Set of GPIO lines to reserve.
config	Request options.
default_vals	Initial line values - only relevant if we're setting the direction to output.

Returns

0 if all lines were properly requested. In case of an error this routine returns -1 and sets the last error number.

If this routine succeeds, the caller takes ownership of the GPIO lines until they're released. All the requested lines must be provided by the same gpiochip.

5.6.3.9 gpiod_line_request_bulk_both_edges_events()

```
int gpiod_line_request_bulk_both_edges_events (
            struct gpiod_line_bulk * bulk,
            const char * consumer )
```

Request all event type notifications on a set of lines.

Parameters

bulk	Set of GPIO lines to request.
consumer	Name of the consumer.

Returns

0 if the operation succeeds, -1 on failure.

5.6.3.10 gpiod_line_request_bulk_both_edges_events_flags()

```
int gpiod_line_request_bulk_both_edges_events_flags (
            struct gpiod_line_bulk * bulk,
            const char * consumer,
            int flags )
```

Request all event type notifications on a set of lines.

Parameters

bulk	Set of GPIO lines to request.
consumer	Name of the consumer.
flags	Additional request flags.

Returns

0 if the operation succeeds, -1 on failure.

5.6.3.11 gpiod_line_request_bulk_falling_edge_events()

```
int gpiod_line_request_bulk_falling_edge_events (
            struct gpiod_line_bulk * bulk,
            const char * consumer )
```

Request falling edge event notifications on a set of lines.

Parameters

bulk	Set of GPIO lines to request.
consumer	Name of the consumer.

Returns

0 if the operation succeeds, -1 on failure.

5.6.3.12 gpiod_line_request_bulk_falling_edge_events_flags()

```
int gpiod_line_request_bulk_falling_edge_events_flags (
            struct gpiod_line_bulk * bulk,
            const char * consumer,
            int flags )
```

Request falling edge event notifications on a set of lines.

Parameters

bulk	Set of GPIO lines to request.
consumer	Name of the consumer.
flags	Additional request flags.

Returns

0 if the operation succeeds, -1 on failure.

5.6.3.13 gpiod_line_request_bulk_input()

```
int gpiod_line_request_bulk_input (
            struct gpiod_line_bulk * bulk,
            const char * consumer )
```

Reserve a set of GPIO lines, set the direction to input.

Parameters

bulk	Set of GPIO lines to reserve.
consumer	Name of the consumer.

Returns

0 if the lines were properly reserved, -1 on failure.

5.6.3.14 gpiod_line_request_bulk_input_flags()

```
int gpiod_line_request_bulk_input_flags (
            struct gpiod_line_bulk * bulk,
            const char * consumer,
            int flags )
```

Reserve a set of GPIO lines, set the direction to input.

Parameters

bulk	Set of GPIO lines to reserve.
consumer	Name of the consumer.
flags	Additional request flags.

Returns

0 if the lines were properly reserved, -1 on failure.

5.6.3.15 gpiod_line_request_bulk_output()

```
int gpiod_line_request_bulk_output (
            struct gpiod_line_bulk * bulk,
            const char * consumer,
            const int * default_vals )
```

Reserve a set of GPIO lines, set the direction to output.

Parameters

bulk	Set of GPIO lines to reserve.
consumer	Name of the consumer.
default_vals	Initial line values.

Returns

0 if the lines were properly reserved, -1 on failure.

5.6.3.16 gpiod_line_request_bulk_output_flags()

```
int gpiod_line_request_bulk_output_flags (
            struct gpiod_line_bulk * bulk,
```

```
            const char * consumer,
            int flags,
            const int * default_vals )
```

Reserve a set of GPIO lines, set the direction to output.

Parameters

bulk	Set of GPIO lines to reserve.
consumer	Name of the consumer.
flags	Additional request flags.
default_vals	Initial line values.

Returns

0 if the lines were properly reserved, -1 on failure.

5.6.3.17 gpiod_line_request_bulk_rising_edge_events()

```
int gpiod_line_request_bulk_rising_edge_events (
            struct gpiod_line_bulk * bulk,
            const char * consumer )
```

Request rising edge event notifications on a set of lines.

Parameters

bulk	Set of GPIO lines to request.
consumer	Name of the consumer.

Returns

0 if the operation succeeds, -1 on failure.

5.6.3.18 gpiod_line_request_bulk_rising_edge_events_flags()

```
int gpiod_line_request_bulk_rising_edge_events_flags (
            struct gpiod_line_bulk * bulk,
            const char * consumer,
            int flags )
```

Request rising edge event notifications on a set of lines.

Parameters

bulk	Set of GPIO lines to request.
consumer	Name of the consumer.
flags	Additional request flags.

Returns

0 if the operation succeeds, -1 on failure.

5.6.3.19 gpiod_line_request_falling_edge_events()

```
int gpiod_line_request_falling_edge_events (
            struct gpiod_line * line,
            const char * consumer )
```

Request falling edge event notifications on a single line.

Parameters

line	GPIO line object.
consumer	Name of the consumer.

Returns

0 if the operation succeeds, -1 on failure.

5.6.3.20 gpiod_line_request_falling_edge_events_flags()

```
int gpiod_line_request_falling_edge_events_flags (
            struct gpiod_line * line,
            const char * consumer,
            int flags )
```

Request falling edge event notifications on a single line.

Parameters

line	GPIO line object.
consumer	Name of the consumer.
flags	Additional request flags.

Returns

0 if the operation succeeds, -1 on failure.

5.6.3.21 gpiod_line_request_input()

```
int gpiod_line_request_input (
            struct gpiod_line * line,
            const char * consumer )
```

Reserve a single line, set the direction to input.

Parameters

line	GPIO line object.
consumer	Name of the consumer.

Returns

0 if the line was properly reserved, -1 on failure.

5.6.3.22 gpiod_line_request_input_flags()

```
int gpiod_line_request_input_flags (
              struct gpiod_line * line,
              const char * consumer,
              int flags )
```

Reserve a single line, set the direction to input.

Parameters

line	GPIO line object.
consumer	Name of the consumer.
flags	Additional request flags.

Returns

0 if the line was properly reserved, -1 on failure.

5.6.3.23 gpiod_line_request_output()

```
int gpiod_line_request_output (
              struct gpiod_line * line,
              const char * consumer,
              int default_val )
```

Reserve a single line, set the direction to output.

Parameters

line	GPIO line object.
consumer	Name of the consumer.
default_val	Initial line value.

Returns

0 if the line was properly reserved, -1 on failure.

5.6.3.24 gpiod_line_request_output_flags()

```
int gpiod_line_request_output_flags (
            struct gpiod_line * line,
            const char * consumer,
            int flags,
            int default_val )
```

Reserve a single line, set the direction to output.

Parameters

line	GPIO line object.
consumer	Name of the consumer.
flags	Additional request flags.
default_val	Initial line value.

Returns

0 if the line was properly reserved, -1 on failure.

5.6.3.25 gpiod_line_request_rising_edge_events()

```
int gpiod_line_request_rising_edge_events (
            struct gpiod_line * line,
            const char * consumer )
```

Request rising edge event notifications on a single line.

Parameters

line	GPIO line object.
consumer	Name of the consumer.

Returns

0 if the operation succeeds, -1 on failure.

5.6.3.26 gpiod_line_request_rising_edge_events_flags()

```
int gpiod_line_request_rising_edge_events_flags (
            struct gpiod_line * line,
            const char * consumer,
            int flags )
```

Request rising edge event notifications on a single line.

Parameters

line	GPIO line object.
consumer	Name of the consumer.
flags	Additional request flags.

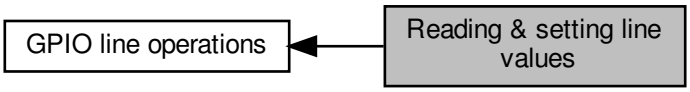
Returns

0 if the operation succeeds, -1 on failure.

5.7 Reading & setting line values

Functions allowing to read and set GPIO line values for single lines and in bulk.

Collaboration diagram for Reading & setting line values:



Functions

- int gpiod_line_get_value (struct gpiod_line *line) GPIOD_API
  Read current value of a single GPIO line.
- int gpiod_line_get_value_bulk (struct gpiod_line_bulk *bulk, int *values) GPIOD_API
  Read current values of a set of GPIO lines.
- int gpiod_line_set_value (struct gpiod_line *line, int value) GPIOD_API
  Set the value of a single GPIO line.
- int gpiod_line_set_value_bulk (struct gpiod_line_bulk *bulk, const int *values) GPIOD_API
  Set the values of a set of GPIO lines.

5.7.1 Detailed Description

Functions allowing to read and set GPIO line values for single lines and in bulk.

5.7.2 Function Documentation

5.7.2.1 gpiod_line_get_value()

```
int gpiod_line_get_value (
            struct gpiod_line * line )
```

Read current value of a single GPIO line.

Parameters

line	GPIO line object.

Returns

0 or 1 if the operation succeeds. On error this routine returns -1 and sets the last error number.

5.7.2.2 gpiod_line_get_value_bulk()

```
int gpiod_line_get_value_bulk (
            struct gpiod_line_bulk * bulk,
            int * values )
```

Read current values of a set of GPIO lines.

Parameters

bulk	Set of GPIO lines to reserve.
values	An array big enough to hold line_bulk->num_lines values.

Returns

0 is the operation succeeds. In case of an error this routine returns -1 and sets the last error number.

If succeeds, this routine fills the values array with a set of values in the same order, the lines are added to line_bulk. If the lines were not previously requested together, the behavior is undefined.

5.7.2.3 gpiod_line_set_value()

```
int gpiod_line_set_value (
            struct gpiod_line * line,
            int value )
```

Set the value of a single GPIO line.

Parameters

line	GPIO line object.
value	New value.

Returns

0 is the operation succeeds. In case of an error this routine returns -1 and sets the last error number.

5.7.2.4 gpiod_line_set_value_bulk()

```
int gpiod_line_set_value_bulk (
            struct gpiod_line_bulk * bulk,
            const int * values )
```

Set the values of a set of GPIO lines.

Parameters

bulk	Set of GPIO lines to reserve.
values	An array holding line_bulk->num_lines new values for lines. A NULL pointer is interpreted as a logical low for all lines.

Returns

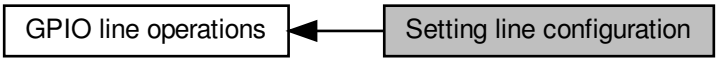
0 is the operation succeeds. In case of an error this routine returns -1 and sets the last error number.

If the lines were not previously requested together, the behavior is undefined.

5.8 Setting line configuration

Functions allowing modification of config options of GPIO lines requested from user-space.

Collaboration diagram for Setting line configuration:



Functions

- int gpiod_line_set_config (struct gpiod_line *line, int direction, int flags, int value) GPIOD_API
  Update the configuration of a single GPIO line.
- int gpiod_line_set_config_bulk (struct gpiod_line_bulk *bulk, int direction, int flags, const int *values) GPIOD_API
  Update the configuration of a set of GPIO lines.
- int gpiod_line_set_flags (struct gpiod_line *line, int flags) GPIOD_API
  Update the configuration flags of a single GPIO line.
- int gpiod_line_set_flags_bulk (struct gpiod_line_bulk *bulk, int flags) GPIOD_API
  Update the configuration flags of a set of GPIO lines.
- int gpiod_line_set_direction_input (struct gpiod_line *line) GPIOD_API
  Set the direction of a single GPIO line to input.
- int gpiod_line_set_direction_input_bulk (struct gpiod_line_bulk *bulk) GPIOD_API
  Set the direction of a set of GPIO lines to input.
- int gpiod_line_set_direction_output (struct gpiod_line *line, int value) GPIOD_API
  Set the direction of a single GPIO line to output.
- int gpiod_line_set_direction_output_bulk (struct gpiod_line_bulk *bulk, const int *values) GPIOD_API
  Set the direction of a set of GPIO lines to output.

5.8.1 Detailed Description

Functions allowing modification of config options of GPIO lines requested from user-space.

5.8.2 Function Documentation

5.8.2.1 gpiod_line_set_config()

```
int gpiod_line_set_config (
            struct gpiod_line * line,
            int direction,
            int flags,
            int value )
```

Update the configuration of a single GPIO line.

Parameters

line	GPIO line object.
direction	Updated direction which may be one of GPIOD_LINE_REQUEST_DIRECTION_AS_IS, GPIOD_LINE_REQUEST_DIRECTION_INPUT, or GPIOD_LINE_REQUEST_DIRECTION_OUTPUT.
flags	Replacement flags.
value	The new output value for the line when direction is GPIOD_LINE_REQUEST_DIRECTION_OUTPUT.

Returns

0 is the operation succeeds. In case of an error this routine returns -1 and sets the last error number.

5.8.2.2 gpiod_line_set_config_bulk()

```
int gpiod_line_set_config_bulk (
            struct gpiod_line_bulk * bulk,
            int direction,
            int flags,
            const int * values )
```

Update the configuration of a set of GPIO lines.

Parameters

bulk	Set of GPIO lines.
direction	Updated direction which may be one of GPIOD_LINE_REQUEST_DIRECTION_AS_IS, GPIOD_LINE_REQUEST_DIRECTION_INPUT, or GPIOD_LINE_REQUEST_DIRECTION_OUTPUT.
flags	Replacement flags.
values	An array holding line_bulk->num_lines new logical values for lines when direction is GPIOD_LINE_REQUEST_DIRECTION_OUTPUT. A NULL pointer is interpreted as a logical low for all lines.

Returns

0 is the operation succeeds. In case of an error this routine returns -1 and sets the last error number.

If the lines were not previously requested together, the behavior is undefined.

5.8.2.3 gpiod_line_set_direction_input()

```
int gpiod_line_set_direction_input (
            struct gpiod_line * line )
```

Set the direction of a single GPIO line to input.

Parameters

line	GPIO line object.

Returns

0 is the operation succeeds. In case of an error this routine returns -1 and sets the last error number.

5.8.2.4 gpiod_line_set_direction_input_bulk()

```
int gpiod_line_set_direction_input_bulk (
              struct gpiod_line_bulk * bulk )
```

Set the direction of a set of GPIO lines to input.

Parameters

bulk	Set of GPIO lines.

Returns

0 is the operation succeeds. In case of an error this routine returns -1 and sets the last error number.

If the lines were not previously requested together, the behavior is undefined.

5.8.2.5 gpiod_line_set_direction_output()

```
int gpiod_line_set_direction_output (
              struct gpiod_line * line,
              int value )
```

Set the direction of a single GPIO line to output.

Parameters

line	GPIO line object.
value	The logical value output on the line.

Returns

0 is the operation succeeds. In case of an error this routine returns -1 and sets the last error number.

5.8.2.6 gpiod_line_set_direction_output_bulk()

```
int gpiod_line_set_direction_output_bulk (
            struct gpiod_line_bulk * bulk,
            const int * values )
```

Set the direction of a set of GPIO lines to output.

Parameters

bulk	Set of GPIO lines.
values	An array holding line_bulk->num_lines new logical values for lines. A NULL pointer is interpreted as a logical low for all lines.

Returns

0 is the operation succeeds. In case of an error this routine returns -1 and sets the last error number.

If the lines were not previously requested together, the behavior is undefined.

5.8.2.7 gpiod_line_set_flags()

```
int gpiod_line_set_flags (
            struct gpiod_line * line,
            int flags )
```

Update the configuration flags of a single GPIO line.

Parameters

line	GPIO line object.
flags	Replacement flags.

Returns

0 is the operation succeeds. In case of an error this routine returns -1 and sets the last error number.

5.8.2.8 gpiod_line_set_flags_bulk()

```
int gpiod_line_set_flags_bulk (
            struct gpiod_line_bulk * bulk,
            int flags )
```

Update the configuration flags of a set of GPIO lines.

Parameters

bulk	Set of GPIO lines.
flags	Replacement flags.

Returns

0 is the operation succeeds. In case of an error this routine returns -1 and sets the last error number.

If the lines were not previously requested together, the behavior is undefined.

5.9 Line events handling

Structures and functions allowing to poll lines for events and read them, both for individual lines as well as in bulk.

Collaboration diagram for Line events handling:

Data Structures

- struct gpiod_line_event

  Structure holding event info.

Enumerations

- enum { GPIOD_LINE_EVENT_RISING_EDGE = 1, GPIOD_LINE_EVENT_FALLING_EDGE }

  Event types.

Functions

- int gpiod_line_event_wait (struct gpiod_line *line, const struct timespec *timeout) GPIOD_API

  Wait for an event on a single line.
- int gpiod_line_event_wait_bulk (struct gpiod_line_bulk *bulk, const struct timespec *timeout, struct gpiod_line_bulk *event_bulk) GPIOD_API

  Wait for events on a set of lines.
- int gpiod_line_event_read (struct gpiod_line *line, struct gpiod_line_event *event) GPIOD_API

  Read next pending event from the GPIO line.
- int gpiod_line_event_read_multiple (struct gpiod_line *line, struct gpiod_line_event *events, unsigned int num_events) GPIOD_API

  Read up to a certain number of events from the GPIO line.
- int gpiod_line_event_get_fd (struct gpiod_line *line) GPIOD_API

  Get the event file descriptor.
- int gpiod_line_event_read_fd (int fd, struct gpiod_line_event *event) GPIOD_API

  Read the last GPIO event directly from a file descriptor.
- int gpiod_line_event_read_fd_multiple (int fd, struct gpiod_line_event *events, unsigned int num_events) GPIOD_API

  Read up to a certain number of events directly from a file descriptor.

5.9.1 Detailed Description

Structures and functions allowing to poll lines for events and read them, both for individual lines as well as in bulk.

Also contains functions for retrieving the associated file descriptors and operate on them for easy integration with standard unix interfaces.

5.9.2 Enumeration Type Documentation

5.9.2.1 anonymous enum

```
anonymous enum
```

Event types.

Enumerator

GPIOD_LINE_EVENT_RISING_EDGE	Rising edge event.
GPIOD_LINE_EVENT_FALLING_EDGE	Falling edge event.

Definition at line 914 of file gpiod.h.

5.9.3 Function Documentation

5.9.3.1 gpiod_line_event_get_fd()

```
int gpiod_line_event_get_fd (
            struct gpiod_line * line )
```

Get the event file descriptor.

Parameters

line	GPIO line object.

Returns

Number of the event file descriptor or -1 if the user tries to retrieve the descriptor from a line that wasn't configured for event monitoring.

Users may want to poll the event file descriptor on their own. This routine allows to access it.

5.9.3.2 gpiod_line_event_read()

```
int gpiod_line_event_read (
            struct gpiod_line * line,
            struct gpiod_line_event * event )
```

Read next pending event from the GPIO line.

Parameters

line	GPIO line object.
event	Buffer to which the event data will be copied.

Returns

0 if the event was read correctly, -1 on error.

Note

This function will block if no event was queued for this line.

5.9.3.3 gpiod_line_event_read_fd()

```
int gpiod_line_event_read_fd (
            int fd,
            struct gpiod_line_event * event )
```

Read the last GPIO event directly from a file descriptor.

Parameters

fd	File descriptor.
event	Buffer in which the event data will be stored.

Returns

0 if the event was read correctly, -1 on error.

Users who directly poll the file descriptor for incoming events can also directly read the event data from it using this routine. This function translates the kernel representation of the event to the libgpiod format.

5.9.3.4 gpiod_line_event_read_fd_multiple()

```
int gpiod_line_event_read_fd_multiple (
            int fd,
            struct gpiod_line_event * events,
            unsigned int num_events )
```

Read up to a certain number of events directly from a file descriptor.

Parameters

fd	File descriptor.
events	Buffer to which the event data will be copied. Must hold at least the amount of events specified in num_events.
num_events	Specifies how many events can be stored in the buffer.

Returns

On success returns the number of events stored in the buffer, on failure -1 is returned.

5.9.3.5 gpiod_line_event_read_multiple()

```
int gpiod_line_event_read_multiple (
            struct gpiod_line * line,
            struct gpiod_line_event * events,
            unsigned int num_events )
```

Read up to a certain number of events from the GPIO line.

Parameters

line	GPIO line object.
events	Buffer to which the event data will be copied. Must hold at least the amount of events specified in num_events.
num_events	Specifies how many events can be stored in the buffer.

Returns

On success returns the number of events stored in the buffer, on failure -1 is returned.

5.9.3.6 gpiod_line_event_wait()

```
int gpiod_line_event_wait (
            struct gpiod_line * line,
            const struct timespec * timeout )
```

Wait for an event on a single line.

Parameters

line	GPIO line object.
timeout	Wait time limit.

Returns

0 if wait timed out, -1 if an error occurred, 1 if an event occurred.

5.9.3.7 gpiod_line_event_wait_bulk()

```
int gpiod_line_event_wait_bulk (
            struct gpiod_line_bulk * bulk,
            const struct timespec * timeout,
            struct gpiod_line_bulk * event_bulk )
```

Wait for events on a set of lines.

Parameters

bulk	Set of GPIO lines to monitor.
timeout	Wait time limit.
event_bulk	Bulk object in which to store the line handles on which events occurred. Can be NULL.

Returns

0 if wait timed out, -1 if an error occurred, 1 if at least one event occurred.

5.10 Stuff that didn't fit anywhere else

Various libgpiod-related functions.

Functions

- const char * gpiod_version_string (void) GPIOD_API

  Get the API version of the library as a human-readable string.

5.10.1 Detailed Description

Various libgpiod-related functions.

5.10.2 Function Documentation

5.10.2.1 gpiod_version_string()

```
const char* gpiod_version_string (
            void  )
```

Get the API version of the library as a human-readable string.

Returns

Human-readable string containing the library version.

5.11 C++ bindings

Data Structures

- class gpiod::chip
  Represents a GPIO chip.
- struct gpiod::line_request
  Stores the configuration for line requests.
- class gpiod::line
  Represents a single GPIO line.
- struct gpiod::line_event
  Describes a single GPIO line event.
- class gpiod::line_bulk
  Represents a set of GPIO lines.
- class gpiod::line_iter
  Allows to iterate over all lines owned by a GPIO chip.

Functions

- bool gpiod::is_gpiochip_device (const ::std::string &path) GPIOD_API
  Check if the file pointed to by path is a GPIO chip character device.
- GPIOD_API line_iter gpiod::begin (line_iter iter) noexcept
  Support for range-based loops for line iterators.
- GPIOD_API line_iter gpiod::end (const line_iter &iter) noexcept
  Support for range-based loops for line iterators.

5.11.1 Detailed Description

5.11.2 Function Documentation

5.11.2.1 begin()

```
GPIOD_API line_iter gpiod::begin (
            line_iter iter )  [noexcept]
```

Support for range-based loops for line iterators.

Parameters

iter	A line iterator.

Returns

Iterator unchanged.

5.11.2.2 end()

```
GPIOD_API line_iter gpiod::end (
            const line_iter & iter )  [noexcept]
```

Support for range-based loops for line iterators.

Parameters

iter	A line iterator.

Returns

New end iterator.

5.11.2.3 is_gpiochip_device()

```
bool gpiod::is_gpiochip_device (
            const ::std::string & path )
```

Check if the file pointed to by path is a GPIO chip character device.

Parameters

path	Path to check.

Returns

True if the file exists and is a GPIO chip character device or a symbolic link to it.

Chapter 6

Data Structure Documentation

6.1 gpiod::chip Class Reference

Represents a GPIO chip.

`#include <gpiod.hpp>`

Public Member Functions

- GPIOD_API chip (void)=default
  Default constructor.
- GPIOD_API chip (const ::std::string &path)
  Constructor.
- GPIOD_API chip (const chip &other)=default
  Copy constructor.
- GPIOD_API chip (chip &&other)=default
  Move constructor.
- GPIOD_API chip & operator= (const chip &other)=default
  Assignment operator.
- GPIOD_API chip & operator= (chip &&other)=default
  Move assignment operator.
- GPIOD_API ~chip (void)=default
  Destructor.
- GPIOD_API void open (const ::std::string &path)
  Open a GPIO chip.
- GPIOD_API void reset (void) noexcept
  Reset the internal smart pointer owned by this object.
- GPIOD_API ::std::string name (void) const
  Return the name of the chip held by this object.
- GPIOD_API ::std::string label (void) const
  Return the label of the chip held by this object.
- GPIOD_API unsigned int num_lines (void) const
  Return the number of lines exposed by this chip.
- GPIOD_API line get_line (unsigned int offset) const
  Get the line exposed by this chip at given offset.

- GPIOD_API ::std::vector< line > find_line (const ::std::string &name, bool unique=false) const

  Find all GPIO lines by name among lines exposed by this GPIO chip.
- GPIOD_API line_bulk get_lines (const ::std::vector< unsigned int > &offsets) const

  Get a set of lines exposed by this chip at given offsets.
- GPIOD_API line_bulk get_all_lines (void) const

  Get all lines exposed by this chip.
- GPIOD_API bool operator== (const chip &rhs) const noexcept

  Equality operator.
- GPIOD_API bool operator!= (const chip &rhs) const noexcept

  Inequality operator.
- GPIOD_API operator bool (void) const noexcept

  Check if this object holds a reference to a GPIO chip.
- GPIOD_API bool operator! (void) const noexcept

  Check if this object doesn't hold a reference to a GPIO chip.

6.1.1 Detailed Description

Represents a GPIO chip.

Internally this class holds a smart pointer to an open GPIO chip descriptor. Multiple objects of this class can reference the same chip. The chip is closed and all resources freed when the last reference is dropped.

Definition at line 46 of file gpiod.hpp.

6.1.2 Constructor & Destructor Documentation

6.1.2.1 chip() [1/4]

```
GPIOD_API gpiod::chip::chip (
            void  )  [default]
```

Default constructor.

Creates an empty GPIO chip object.

6.1.2.2 chip() [2/4]

```
GPIOD_API gpiod::chip::chip (
            const ::std::string & path )
```

Constructor.

Opens the chip using chip::open.

Parameters

path	Path to the GPIO chip device.

6.1.2.3 chip() [3/4]

```
GPIOD_API gpiod::chip::chip (
            const chip & other )  [default]
```

Copy constructor.

References the object held by other.

Parameters

other	Other chip object.

6.1.2.4 chip() [4/4]

```
GPIOD_API gpiod::chip::chip (
            chip && other )  [default]
```

Move constructor.

References the object held by other.

Parameters

other	Other chip object.

6.1.2.5 ~chip()

```
GPIOD_API gpiod::chip::~chip (
            void  )  [default]
```

Destructor.

Unreferences the internal chip object.

6.1.3 Member Function Documentation

6.1.3.1 find_line()

```
GPIOD_API ::std::vector<line> gpiod::chip::find_line (
            const ::std::string & name,
            bool unique = false ) const
```

Find all GPIO lines by name among lines exposed by this GPIO chip.

Parameters

name	Line name.
unique	If set to true: throw an error if multiple lines match the name.

Returns

Vector of all matching lines.

6.1.3.2 get_all_lines()

```
GPIOD_API line_bulk gpiod::chip::get_all_lines (
            void  ) const
```

Get all lines exposed by this chip.

Returns

All lines exposed by this chip held by a line_bulk object.

6.1.3.3 get_line()

```
GPIOD_API line gpiod::chip::get_line (
            unsigned int offset ) const
```

Get the line exposed by this chip at given offset.

Parameters

offset	Offset of the line.

Returns

Line object.

6.1.3.4 get_lines()

```
GPIOD_API line_bulk gpiod::chip::get_lines (
            const ::std::vector< unsigned int > & offsets ) const
```

Get a set of lines exposed by this chip at given offsets.

Parameters

offsets	Vector of line offsets.

Returns

Set of lines held by a line_bulk object.

6.1.3.5 label()

```
GPIOD_API ::std::string gpiod::chip::label (
            void ) const
```

Return the label of the chip held by this object.

Returns

Label of the GPIO chip.

6.1.3.6 name()

```
GPIOD_API ::std::string gpiod::chip::name (
            void ) const
```

Return the name of the chip held by this object.

Returns

Name of the GPIO chip.

6.1.3.7 num_lines()

```
GPIOD_API unsigned int gpiod::chip::num_lines (
            void ) const
```

Return the number of lines exposed by this chip.

Returns

Number of lines.

6.1.3.8 open()

```
GPIOD_API void gpiod::chip::open (
            const ::std::string & path )
```

Open a GPIO chip.

Parameters

path	Path to the GPIO chip device.

If the object already holds a reference to an open chip, it will be closed and the reference reset.

6.1.3.9 operator bool()

```
GPIOD_API gpiod::chip::operator bool (
            void ) const [explicit], [noexcept]
```

Check if this object holds a reference to a GPIO chip.

Returns

True if this object references a GPIO chip, false otherwise.

6.1.3.10 operator"!()

```
GPIOD_API bool gpiod::chip::operator! (
            void ) const [noexcept]
```

Check if this object doesn't hold a reference to a GPIO chip.

Returns

False if this object references a GPIO chip, true otherwise.

6.1.3.11 operator"!=()

```
GPIOD_API bool gpiod::chip::operator!= (
            const chip & rhs ) const [noexcept]
```

Inequality operator.

Parameters

rhs	Right-hand side of the equation.

Returns

False if rhs references the same chip. True otherwise.

6.1.3.12 operator=() [1/2]

```
GPIOD_API chip& gpiod::chip::operator= (
            const chip & other )  [default]
```

Assignment operator.

References the object held by other.

Parameters

other	Other chip object.

Returns

Reference to this object.

6.1.3.13 operator=() [2/2]

```
GPIOD_API chip& gpiod::chip::operator= (
            chip && other )  [default]
```

Move assignment operator.

References the object held by other.

Parameters

other	Other chip object.

Returns

Reference to this object.

6.1.3.14 operator==()

```
GPIOD_API bool gpiod::chip::operator== (
            const chip & rhs ) const  [noexcept]
```

Equality operator.

Parameters

rhs	Right-hand side of the equation.

Returns

True if rhs references the same chip. False otherwise.

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

- gpiod.hpp

6.2 gpiod_line_event Struct Reference

Structure holding event info.

`#include <gpiod.h>`

Data Fields

- struct timespec ts

  Best estimate of time of event occurrence.
- int event_type

  Type of the event that occurred.
- int offset

  Offset of line on which the event occurred.

6.2.1 Detailed Description

Structure holding event info.

Definition at line 924 of file gpiod.h.

6.2.2 Field Documentation

6.2.2.1 event_type

`int gpiod_line_event::event_type`

Type of the event that occurred.

Definition at line 927 of file gpiod.h.

6.2.2.2 offset

```
int gpiod_line_event::offset
```

Offset of line on which the event occurred.

Definition at line 929 of file gpiod.h.

6.2.2.3 ts

```
struct timespec gpiod_line_event::ts
```

Best estimate of time of event occurrence.

Definition at line 925 of file gpiod.h.

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

- gpiod.h

6.3 gpiod_line_request_config Struct Reference

Structure holding configuration of a line request.

```
#include <gpiod.h>
```

Data Fields

- const char * consumer
  Name of the consumer.
- int request_type
  Request type.
- int flags
  Other configuration flags.

6.3.1 Detailed Description

Structure holding configuration of a line request.

Definition at line 449 of file gpiod.h.

6.3.2 Field Documentation

6.3.2.1 consumer

```
const char* gpiod_line_request_config::consumer
```

Name of the consumer.

Definition at line 450 of file gpiod.h.

6.3.2.2 flags

```
int gpiod_line_request_config::flags
```

Other configuration flags.

Definition at line 454 of file gpiod.h.

6.3.2.3 request_type

```
int gpiod_line_request_config::request_type
```

Request type.

Definition at line 452 of file gpiod.h.

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

- gpiod.h

6.4 gpiod::line_bulk::iterator Class Reference

Iterator for iterating over lines held by line_bulk.

```
#include <gpiod.hpp>
```

Public Member Functions

- GPIOD_API iterator (void)=default
  Default constructor.
- GPIOD_API iterator (const iterator &other)=default
  Copy constructor.
- GPIOD_API iterator (iterator &&other)=default
  Move constructor.
- GPIOD_API iterator & operator= (const iterator &other)=default
  Assignment operator.
- GPIOD_API iterator & operator= (iterator &&other)=default
  Move assignment operator.
- GPIOD_API ~iterator (void)=default
  Destructor.
- GPIOD_API iterator & operator++ (void)
  Advance the iterator by one element.
- GPIOD_API const line & operator* (void) const
  Dereference current element.
- GPIOD_API const line * operator-> (void) const
  Member access operator.
- GPIOD_API bool operator== (const iterator &rhs) const noexcept
  Check if this operator points to the same element.
- GPIOD_API bool operator!= (const iterator &rhs) const noexcept
  Check if this operator doesn't point to the same element.

6.4.1 Detailed Description

Iterator for iterating over lines held by line_bulk.

Definition at line 735 of file gpiod.hpp.

6.4.2 Constructor & Destructor Documentation

6.4.2.1 iterator() [1/3]

```
GPIOD_API gpiod::line_bulk::iterator::iterator (
            void  )  [default]
```

Default constructor.

Builds an empty iterator object.

6.4.2.2 iterator() [2/3]

```
GPIOD_API gpiod::line_bulk::iterator::iterator (
            const iterator & other )  [default]
```

Copy constructor.

Parameters

other	Other line_bulk iterator.

6.4.2.3 iterator() [3/3]

```
GPIOD_API gpiod::line_bulk::iterator::iterator (
            iterator && other )  [default]
```

Move constructor.

Parameters

other	Other line_bulk iterator.

6.4.3 Member Function Documentation

6.4.3.1 operator"!=()

```
GPIOD_API bool gpiod::line_bulk::iterator::operator!= (
            const iterator & rhs ) const  [noexcept]
```

Check if this operator doesn't point to the same element.

Parameters

rhs	Right-hand side of the equation.

Returns

True if this iterator doesn't point to the same GPIO line, false otherwise.

6.4.3.2 operator*()

```
GPIOD_API const line& gpiod::line_bulk::iterator::operator* (
            void  ) const
```

Dereference current element.

Returns

Current GPIO line by reference.

6.4.3.3 operator++()

```
GPIOD_API iterator& gpiod::line_bulk::iterator::operator++ (
            void  )
```

Advance the iterator by one element.

Returns

Reference to this iterator.

6.4.3.4 operator->()

```
GPIOD_API const line* gpiod::line_bulk::iterator::operator-> (
            void  ) const
```

Member access operator.

Returns

Current GPIO line by pointer.

6.4.3.5 operator=() [1/2]

```
GPIOD_API iterator& gpiod::line_bulk::iterator::operator= (
            const iterator & other )  [default]
```

Assignment operator.

Parameters

other	Other line_bulk iterator.

Returns

Reference to this iterator.

6.4.3.6 operator=() [2/2]

```
GPIOD_API iterator& gpiod::line_bulk::iterator::operator= (
            iterator && other )  [default]
```

Move assignment operator.

Parameters

other	Other line_bulk iterator.

Returns

Reference to this iterator.

6.4.3.7 operator==()

```
GPIOD_API bool gpiod::line_bulk::iterator::operator== (
            const iterator & rhs ) const  [noexcept]
```

Check if this operator points to the same element.

Parameters

rhs	Right-hand side of the equation.

Returns

True if this iterator points to the same GPIO line, false otherwise.

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

- gpiod.hpp

6.5 gpiod::line Class Reference

Represents a single GPIO line.

```
#include <gpiod.hpp>
```

Public Types

- enum : int { DIRECTION_INPUT = 1, DIRECTION_OUTPUT }

  Possible direction settings.
- enum : int { DRIVE_PUSH_PULL = 1, DRIVE_OPEN_DRAIN, DRIVE_OPEN_SOURCE }

  Possible drive settings.
- enum : int { BIAS_UNKNOWN = 1, BIAS_DISABLED, BIAS_PULL_UP, BIAS_PULL_DOWN }

  Possible bias settings.

Public Member Functions

- GPIOD_API line (void)

  Default constructor.
- GPIOD_API line (const line &other)=default

  Copy constructor.
- GPIOD_API line (line &&other)=default

  Move constructor.
- GPIOD_API line & operator= (const line &other)=default

  Assignment operator.
- GPIOD_API line & operator= (line &&other)=default

  Move assignment operator.
- GPIOD_API ~line (void)=default

  Destructor.
- GPIOD_API unsigned int offset (void) const

  Get the offset of this line.
- GPIOD_API ::std::string name (void) const

  Get the name of this line (if any).
- GPIOD_API ::std::string consumer (void) const

  Get the consumer of this line (if any).
- GPIOD_API int direction (void) const

  Get current direction of this line.
- GPIOD_API bool is_active_low (void) const

  Check if this line's signal is inverted.
- GPIOD_API int bias (void) const

  Get current bias of this line.
- GPIOD_API bool is_used (void) const

  Check if this line is used by the kernel or other user space process.
- GPIOD_API int drive (void) const

  Get current drive setting of this line.
- GPIOD_API void request (const line_request &config, int default_val=0) const

  Request this line.
- GPIOD_API void release (void) const

  Release the line if it was previously requested.
- GPIOD_API bool is_requested (void) const

  Check if this user has ownership of this line.
- GPIOD_API int get_value (void) const

  Read the line value.
- GPIOD_API void set_value (int val) const

  Set the value of this line.
- GPIOD_API void set_config (int direction, ::std::bitset< 32 > flags, int value=0) const

  Set configuration of this line.
- GPIOD_API void set_flags (::std::bitset< 32 > flags) const

  Set configuration flags of this line.
- GPIOD_API void set_direction_input () const

  Change the direction this line to input.
- GPIOD_API void set_direction_output (int value=0) const

  Change the direction this lines to output.
- GPIOD_API bool event_wait (const ::std::chrono::nanoseconds &timeout) const

  Wait for an event on this line.
- GPIOD_API line_event event_read (void) const

Read a line event.

- GPIOD_API ::std::vector< line_event > event_read_multiple (void) const

  Read multiple line events.

- GPIOD_API int event_get_fd (void) const

  Get the event file descriptor associated with this line.

- GPIOD_API const chip get_chip (void) const

  Get the parent chip.

- GPIOD_API void update (void) const

  Re-read the line info from the kernel.

- GPIOD_API void reset (void)

  Reset the state of this object.

- GPIOD_API bool operator== (const line &rhs) const noexcept

  Check if two line objects reference the same GPIO line.

- GPIOD_API bool operator!= (const line &rhs) const noexcept

  Check if two line objects reference different GPIO lines.

- GPIOD_API operator bool (void) const noexcept

  Check if this object holds a reference to any GPIO line.

- GPIOD_API bool operator! (void) const noexcept

  Check if this object doesn't reference any GPIO line.

6.5.1 Detailed Description

Represents a single GPIO line.

Internally this class holds a raw pointer to a GPIO line descriptor and a reference to the parent chip. All line resources are freed when the last reference to the parent chip is dropped.

Definition at line 246 of file gpiod.hpp.

6.5.2 Member Enumeration Documentation

6.5.2.1 anonymous enum

```
anonymous enum : int
```

Possible bias settings.

Enumerator

BIAS_UNKNOWN	Line's bias state is unknown.
BIAS_DISABLED	Line's internal bias is disabled.
BIAS_PULL_UP	Line's internal pull-up bias is enabled.
BIAS_PULL_DOWN	Line's internal pull-down bias is enabled.

Definition at line 490 of file gpiod.hpp.

6.5.2.2 anonymous enum

```
anonymous enum :  int
```

Possible direction settings.

Enumerator

DIRECTION_INPUT	Line's direction setting is input.
DIRECTION_OUTPUT	Line's direction setting is output.

Definition at line 468 of file gpiod.hpp.

6.5.2.3 anonymous enum

```
anonymous enum :  int
```

Possible drive settings.

Enumerator

DRIVE_PUSH_PULL	Drive setting is unknown.
DRIVE_OPEN_DRAIN	Line output is open-drain.
DRIVE_OPEN_SOURCE	Line output is open-source.

Definition at line 478 of file gpiod.hpp.

6.5.3 Constructor & Destructor Documentation

6.5.3.1 line() [1/3]

```
GPIOD_API gpiod::line::line (
            void  )
```

Default constructor.

Creates an empty line object.

6.5.3.2 line() [2/3]

```
GPIOD_API gpiod::line::line (
            const line & other )  [default]
```

Copy constructor.

Parameters

other	Other line object.

6.5.3.3 line() [3/3]

```
GPIOD_API gpiod::line::line (
            line && other )  [default]
```

Move constructor.

Parameters

other	Other line object.

6.5.4 Member Function Documentation

6.5.4.1 bias()

```
GPIOD_API int gpiod::line::bias (
            void  ) const
```

Get current bias of this line.

Returns

Current bias setting.

6.5.4.2 consumer()

```
GPIOD_API ::std::string gpiod::line::consumer (
            void  ) const
```

Get the consumer of this line (if any).

Returns

Name of the consumer of this line or an empty string if it is unused.

6.5.4.3 direction()

```
GPIOD_API int gpiod::line::direction (
            void  ) const
```

Get current direction of this line.

Returns

Current direction setting.

6.5.4.4 drive()

```
GPIOD_API int gpiod::line::drive (
            void  ) const
```

Get current drive setting of this line.

Returns

Current drive setting.

6.5.4.5 event_get_fd()

```
GPIOD_API int gpiod::line::event_get_fd (
            void  ) const
```

Get the event file descriptor associated with this line.

Returns

File descriptor number.

6.5.4.6 event_read()

```
GPIOD_API line_event gpiod::line::event_read (
            void  ) const
```

Read a line event.

Returns

Line event object.

6.5.4.7 event_read_multiple()

```
GPIOD_API ::std::vector<line_event> gpiod::line::event_read_multiple (
            void  ) const
```

Read multiple line events.

Returns

Vector of line event objects.

6.5.4.8 event_wait()

```
GPIOD_API bool gpiod::line::event_wait (
            const ::std::chrono::nanoseconds & timeout ) const
```

Wait for an event on this line.

Parameters

timeout	Time to wait before returning if no event occurred.

Returns

True if an event occurred and can be read, false if the wait timed out.

6.5.4.9 get_chip()

```
GPIOD_API const chip gpiod::line::get_chip (
            void  ) const
```

Get the parent chip.

Returns

Parent chip of this line.

6.5.4.10 get_value()

```
GPIOD_API int gpiod::line::get_value (
            void  ) const
```

Read the line value.

Returns

Current value (0 or 1).

6.5.4.11 is_active_low()

```
GPIOD_API bool gpiod::line::is_active_low (
            void  ) const
```

Check if this line's signal is inverted.

Returns

True if this line is "active-low", false otherwise.

6.5.4.12 is_requested()

```
GPIOD_API bool gpiod::line::is_requested (
            void  ) const
```

Check if this user has ownership of this line.

Returns

True if the user has ownership of this line, false otherwise.

6.5.4.13 is_used()

```
GPIOD_API bool gpiod::line::is_used (
            void  ) const
```

Check if this line is used by the kernel or other user space process.

Returns

True if this line is in use, false otherwise.

6.5.4.14 name()

```
GPIOD_API ::std::string gpiod::line::name (
            void  ) const
```

Get the name of this line (if any).

Returns

Name of this line or an empty string if it is unnamed.

6.5.4.15 offset()

```
GPIOD_API unsigned int gpiod::line::offset (
            void  ) const
```

Get the offset of this line.

Returns

Offet of this line.

6.5.4.16 operator bool()

```
GPIOD_API gpiod::line::operator bool (
            void  ) const  [explicit], [noexcept]
```

Check if this object holds a reference to any GPIO line.

Returns

True if this object references a GPIO line, false otherwise.

6.5.4.17 operator"!()

```
GPIOD_API bool gpiod::line::operator!  (
            void  ) const  [noexcept]
```

Check if this object doesn't reference any GPIO line.

Returns

True if this object doesn't reference any GPIO line, true otherwise.

6.5.4.18 operator"!=()

```
GPIOD_API bool gpiod::line::operator!= (
            const line & rhs ) const  [noexcept]
```

Check if two line objects reference different GPIO lines.

Parameters

rhs	Right-hand side of the equation.

Returns

False if both objects reference the same line, true otherwise.

6.5.4.19 operator=() [1/2]

```
GPIOD_API line& gpiod::line::operator= (
            const line & other )  [default]
```

Assignment operator.

Parameters

other	Other line object.

Returns

Reference to this object.

6.5.4.20 operator=() [2/2]

```
GPIOD_API line& gpiod::line::operator= (
            line && other )  [default]
```

Move assignment operator.

Parameters

other	Other line object.

Returns

Reference to this object.

6.5.4.21 operator==()

```
GPIOD_API bool gpiod::line::operator== (
            const line & rhs ) const  [noexcept]
```

Check if two line objects reference the same GPIO line.

Parameters

rhs	Right-hand side of the equation.

Returns

True if both objects reference the same line, fale otherwise.

6.5.4.22 request()

```
GPIOD_API void gpiod::line::request (
            const line_request & config,
            int default_val = 0 ) const
```

Request this line.

Parameters

config	Request config (see gpiod::line_request).
default_val	Default value - only matters for OUTPUT direction.

6.5.4.23 reset()

```
GPIOD_API void gpiod::line::reset (
            void  )
```

Reset the state of this object.

This is useful when the user needs to e.g. keep the line_event object but wants to drop the reference to the GPIO chip indirectly held by the line being the source of the event.

6.5.4.24 set_config()

```
GPIOD_API void gpiod::line::set_config (
            int direction,
            ::std::bitset< 32 > flags,
            int value = 0 ) const
```

Set configuration of this line.

Parameters

direction	New direction.
flags	Replacement flags.
value	New value (0 or 1) - only matters for OUTPUT direction.

6.5.4.25 set_direction_output()

```
GPIOD_API void gpiod::line::set_direction_output (
            int value = 0 ) const
```

Change the direction this lines to output.

Parameters

value	New value (0 or 1).

6.5.4.26 set_flags()

```
GPIOD_API void gpiod::line::set_flags (
            ::std::bitset< 32 > flags ) const
```

Set configuration flags of this line.

Parameters

flags	Replacement flags.

6.5.4.27 set_value()

```
GPIOD_API void gpiod::line::set_value (
            int val ) const
```

Set the value of this line.

Parameters

val	New value (0 or 1).

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

- gpiod.hpp

6.6 gpiod::line_bulk Class Reference

Represents a set of GPIO lines.

```
#include <gpiod.hpp>
```

Data Structures

- class iterator

  Iterator for iterating over lines held by line_bulk.

Public Member Functions

- GPIOD_API line_bulk (void)=default

  Default constructor.
- GPIOD_API line_bulk (const ::std::vector< line > &lines)

  Construct a line_bulk from a vector of lines.
- GPIOD_API line_bulk (const line_bulk &other)=default

  Copy constructor.
- GPIOD_API line_bulk (line_bulk &&other)=default

  Move constructor.
- GPIOD_API line_bulk & operator= (const line_bulk &other)=default

  Assignment operator.
- GPIOD_API line_bulk & operator= (line_bulk &&other)=default

  Move assignment operator.
- GPIOD_API ~line_bulk (void)=default

  Destructor.
- GPIOD_API void append (const line &new_line)

  Add a line to this line_bulk object.
- GPIOD_API line & get (unsigned int index)

  Get the line at given offset.
- GPIOD_API line & operator[ ] (unsigned int index)

  Get the line at given offset without bounds checking.
- GPIOD_API unsigned int size (void) const noexcept

  Get the number of lines currently held by this object.
- GPIOD_API bool empty (void) const noexcept

  Check if this line_bulk doesn't hold any lines.
- GPIOD_API void clear (void)

  Remove all lines from this object.
- GPIOD_API void request (const line_request &config, const ::std::vector< int > default_vals=::std::vector< int >()) const

  Request all lines held by this object.
- GPIOD_API void release (void) const

  Release all lines held by this object.
- GPIOD_API ::std::vector< int > get_values (void) const

  Read values from all lines held by this object.
- GPIOD_API void set_values (const ::std::vector< int > &values) const

  Set values of all lines held by this object.
- GPIOD_API void set_config (int direction, ::std::bitset< 32 > flags, const ::std::vector< int > values=::std::vector< int >()) const

  Set configuration of all lines held by this object.
- GPIOD_API void set_flags (::std::bitset< 32 > flags) const

  Set configuration flags of all lines held by this object.
- GPIOD_API void set_direction_input () const

  Change the direction all lines held by this object to input.
- GPIOD_API void set_direction_output (const ::std::vector< int > &values) const

Change the direction all lines held by this object to output.

- GPIOD_API line_bulk event_wait (const ::std::chrono::nanoseconds &timeout) const

  Poll the set of lines for line events.
- GPIOD_API operator bool (void) const noexcept

  Check if this object holds any lines.
- GPIOD_API bool operator! (void) const noexcept

  Check if this object doesn't hold any lines.
- GPIOD_API iterator begin (void) noexcept

  Returns an iterator to the first line.
- GPIOD_API iterator end (void) noexcept

  Returns an iterator to the element following the last line.

Static Public Attributes

- static GPIOD_API const unsigned int MAX_LINES

  Max number of lines that this object can hold.

6.6.1 Detailed Description

Represents a set of GPIO lines.

Internally an object of this class stores an array of line objects owned by a single chip.

Definition at line 560 of file gpiod.hpp.

6.6.2 Constructor & Destructor Documentation

6.6.2.1 line_bulk() [1/4]

```
GPIOD_API gpiod::line_bulk::line_bulk (
            void  )  [default]
```

Default constructor.

Creates an empty line_bulk object.

6.6.2.2 line_bulk() [2/4]

```
GPIOD_API gpiod::line_bulk::line_bulk (
            const ::std::vector< line > & lines )
```

Construct a line_bulk from a vector of lines.

Parameters

lines	Vector of gpiod::line objects.

Note

All lines must be owned by the same GPIO chip.

6.6.2.3 line_bulk() [3/4]

```
GPIOD_API gpiod::line_bulk::line_bulk (
            const line_bulk & other )  [default]
```

Copy constructor.

Parameters

other	Other line_bulk object.

6.6.2.4 line_bulk() [4/4]

```
GPIOD_API gpiod::line_bulk::line_bulk (
            line_bulk && other )  [default]
```

Move constructor.

Parameters

other	Other line_bulk object.

6.6.3 Member Function Documentation

6.6.3.1 append()

```
GPIOD_API void gpiod::line_bulk::append (
            const line & new_line )
```

Add a line to this line_bulk object.

Parameters

new_line	Line to add.

Note

The new line must be owned by the same chip as all the other lines already held by this line_bulk object.

6.6.3.2 begin()

```
GPIOD_API iterator gpiod::line_bulk::begin (
            void  )  [noexcept]
```

Returns an iterator to the first line.

Returns

A line_bulk iterator.

6.6.3.3 empty()

```
GPIOD_API bool gpiod::line_bulk::empty (
            void  ) const  [noexcept]
```

Check if this line_bulk doesn't hold any lines.

Returns

True if this object is empty, false otherwise.

6.6.3.4 end()

```
GPIOD_API iterator gpiod::line_bulk::end (
            void  )  [noexcept]
```

Returns an iterator to the element following the last line.

Returns

A line_bulk iterator.

6.6.3.5 event_wait()

```
GPIOD_API line_bulk gpiod::line_bulk::event_wait (
            const ::std::chrono::nanoseconds & timeout ) const
```

Poll the set of lines for line events.

Parameters

timeout	Number of nanoseconds to wait before returning an empty line_bulk.

Returns

Returns a line_bulk object containing lines on which events occurred.

6.6.3.6 get()

```
GPIOD_API line& gpiod::line_bulk::get (
            unsigned int index )
```

Get the line at given offset.

Parameters

index	Index of the line to get.

Returns

Reference to the line object.

Note

This method will throw if index is equal or greater than the number of lines currently held by this bulk.

6.6.3.7 get_values()

```
GPIOD_API ::std::vector<int> gpiod::line_bulk::get_values (
            void  ) const
```

Read values from all lines held by this object.

Returns

Vector containing line values the order of which corresponds with the order of lines in the internal array.

6.6.3.8 operator bool()

```
GPIOD_API gpiod::line_bulk::operator bool (
            void  ) const  [explicit], [noexcept]
```

Check if this object holds any lines.

Returns

True if this line_bulk holds at least one line, false otherwise.

6.6.3.9 operator"!()

```
GPIOD_API bool gpiod::line_bulk::operator!  (
            void  ) const  [noexcept]
```

Check if this object doesn't hold any lines.

Returns

True if this line_bulk is empty, false otherwise.

6.6.3.10 operator=() [1/2]

```
GPIOD_API line_bulk& gpiod::line_bulk::operator= (
            const line_bulk & other )  [default]
```

Assignment operator.

Parameters

other	Other line_bulk object.

Returns

Reference to this object.

6.6.3.11 operator=() [2/2]

```
GPIOD_API line_bulk& gpiod::line_bulk::operator= (
            line_bulk && other )  [default]
```

Move assignment operator.

Parameters

other	Other line_bulk object.

Returns

Reference to this object.

6.6.3.12 operator[]()

```
GPIOD_API line& gpiod::line_bulk::operator[] (
            unsigned int index )
```

Get the line at given offset without bounds checking.

Parameters

index	Offset of the line to get.

Returns

Reference to the line object.

Note

No bounds checking is performed.

6.6.3.13 request()

```
GPIOD_API void gpiod::line_bulk::request (
            const line_request & config,
            const ::std::vector< int > default_vals = ::std::vector< int >() ) const
```

Request all lines held by this object.

Parameters

config	Request config (see gpiod::line_request).
default_vals	Vector of default values. Only relevant for output direction requests.

6.6.3.14 set_config()

```
GPIOD_API void gpiod::line_bulk::set_config (
            int direction,
            ::std::bitset< 32 > flags,
            const ::std::vector< int > values = ::std::vector< int >() ) const
```

Set configuration of all lines held by this object.

Parameters

direction	New direction.
flags	Replacement flags.
values	Vector of values to set. Must be the same size as the number of lines held by this line_bulk. Only relevant for output direction requests.

6.6.3.15 set_direction_output()

```
GPIOD_API void gpiod::line_bulk::set_direction_output (
            const ::std::vector< int > & values ) const
```

Change the direction all lines held by this object to output.

Parameters

values	Vector of values to set. Must be the same size as the number of lines held by this line_bulk.

6.6.3.16 set_flags()

```
GPIOD_API void gpiod::line_bulk::set_flags (
            ::std::bitset< 32 > flags ) const
```

Set configuration flags of all lines held by this object.

Parameters

flags	Replacement flags.

6.6.3.17 set_values()

```
GPIOD_API void gpiod::line_bulk::set_values (
            const ::std::vector< int > & values ) const
```

Set values of all lines held by this object.

Parameters

values	Vector of values to set. Must be the same size as the number of lines held by this line_bulk.

6.6.3.18 size()

```
GPIOD_API unsigned int gpiod::line_bulk::size (
            void  ) const  [noexcept]
```

Get the number of lines currently held by this object.

Returns

Number of elements in this line_bulk.

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

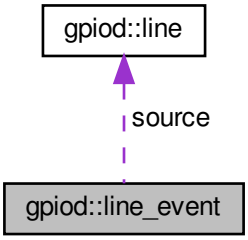
- gpiod.hpp

6.7 gpiod::line_event Struct Reference

Describes a single GPIO line event.

```
#include <gpiod.hpp>
```

Collaboration diagram for gpiod::line_event:



Public Types

- enum : int { RISING_EDGE = 1, FALLING_EDGE }

  Possible event types.

Data Fields

- ::std::chrono::nanoseconds timestamp

  Best estimate of time of event occurrence in nanoseconds.
- int event_type

  Type of the event that occurred.
- line source

  Line object referencing the GPIO line on which the event occurred.

6.7.1 Detailed Description

Describes a single GPIO line event.

Definition at line 534 of file gpiod.hpp.

6.7.2 Member Enumeration Documentation

6.7.2.1 anonymous enum

```
anonymous enum :  int
```

Possible event types.

Enumerator

RISING_EDGE	Rising edge event.
FALLING_EDGE	Falling edge event.

Definition at line 539 of file gpiod.hpp.

6.7.3 Field Documentation

6.7.3.1 event_type

```
int gpiod::line_event::event_type
```

Type of the event that occurred.

Definition at line 548 of file gpiod.hpp.

6.7.3.2 source

```
line gpiod::line_event::source
```

Line object referencing the GPIO line on which the event occurred.

Definition at line 550 of file gpiod.hpp.

6.7.3.3 timestamp

```
::std::chrono::nanoseconds gpiod::line_event::timestamp
```

Best estimate of time of event occurrence in nanoseconds.

Definition at line 546 of file gpiod.hpp.

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

- gpiod.hpp

6.8 gpiod::line_iter Class Reference

Allows to iterate over all lines owned by a GPIO chip.

```
#include <gpiod.hpp>
```

Public Member Functions

- GPIOD_API line_iter (void)=default
  Default constructor.
- GPIOD_API line_iter (const chip &owner)
  Constructor.
- GPIOD_API line_iter (const line_iter &other)=default
  Copy constructor.
- GPIOD_API line_iter (line_iter &&other)=default
  Move constructor.
- GPIOD_API line_iter & operator= (const line_iter &other)=default
  Assignment operator.
- GPIOD_API line_iter & operator= (line_iter &&other)=default
  Move assignment operator.
- GPIOD_API ~line_iter (void)=default
  Destructor.
- GPIOD_API line_iter & operator++ (void)
  Advance the iterator by one element.
- GPIOD_API const line & operator* (void) const
  Dereference current element.
- GPIOD_API const line * operator-> (void) const
  Member access operator.
- GPIOD_API bool operator== (const line_iter &rhs) const noexcept
  Check if this operator points to the same element.
- GPIOD_API bool operator!= (const line_iter &rhs) const noexcept
  Check if this operator doesn't point to the same element.

6.8.1 Detailed Description

Allows to iterate over all lines owned by a GPIO chip.

Definition at line 864 of file gpiod.hpp.

6.8.2 Constructor & Destructor Documentation

6.8.2.1 line_iter() [1/4]

```
GPIOD_API gpiod::line_iter::line_iter (
            void  )  [default]
```

Default constructor.

Creates the end iterator.

6.8.2.2 line_iter() [2/4]

```
GPIOD_API gpiod::line_iter::line_iter (
            const chip & owner )
```

Constructor.

Creates the begin iterator.

Parameters

owner	Chip owning the GPIO lines over which we want to iterate.

6.8.2.3 line_iter() [3/4]

```
GPIOD_API gpiod::line_iter::line_iter (
            const line_iter & other )  [default]
```

Copy constructor.

Parameters

other	Other line iterator.

6.8.2.4 line_iter() [4/4]

```
GPIOD_API gpiod::line_iter::line_iter (
            line_iter && other )  [default]
```

Move constructor.

Parameters

other	Other line iterator.

6.8.3 Member Function Documentation

6.8.3.1 operator"!=()

```
GPIOD_API bool gpiod::line_iter::operator!= (
            const line_iter & rhs ) const  [noexcept]
```

Check if this operator doesn't point to the same element.

Parameters

rhs	Right-hand side of the equation.

Returns

True if this iterator doesn't point to the same line_iter, false otherwise.

6.8.3.2 operator*()

```
GPIOD_API const line& gpiod::line_iter::operator* (
            void  ) const
```

Dereference current element.

Returns

Current GPIO line by reference.

6.8.3.3 operator++()

```
GPIOD_API line_iter& gpiod::line_iter::operator++ (
            void  )
```

Advance the iterator by one element.

Returns

Reference to this iterator.

6.8.3.4 operator->()

```
GPIOD_API const line* gpiod::line_iter::operator-> (
            void  ) const
```

Member access operator.

Returns

Current GPIO line by pointer.

6.8.3.5 operator=() [1/2]

```
GPIOD_API line_iter& gpiod::line_iter::operator= (
            const line_iter & other )  [default]
```

Assignment operator.

Parameters

other	Other line iterator.

Returns

Reference to this line_iter.

6.8.3.6 operator=() [2/2]

```
GPIOD_API line_iter& gpiod::line_iter::operator= (
            line_iter && other )  [default]
```

Move assignment operator.

Parameters

other	Other line iterator.

Returns

Reference to this line_iter.

6.8.3.7 operator==()

```
GPIOD_API bool gpiod::line_iter::operator== (
            const line_iter & rhs ) const  [noexcept]
```

Check if this operator points to the same element.

Parameters

rhs	Right-hand side of the equation.

Returns

True if this iterator points to the same line_iter, false otherwise.

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

- gpiod.hpp

6.9 gpiod::line_request Struct Reference

Stores the configuration for line requests.

`#include <gpiod.hpp>`

Public Types

- enum : int {
  DIRECTION_AS_IS = 1, DIRECTION_INPUT, DIRECTION_OUTPUT, EVENT_FALLING_EDGE,
  EVENT_RISING_EDGE, EVENT_BOTH_EDGES }

  Request types.

Data Fields

- ::std::string consumer

  Consumer name to pass to the request.
- int request_type

  Type of the request.
- ::std::bitset< 32 > flags

  Additional request flags.

Static Public Attributes

- static GPIOD_API const ::std::bitset< 32 > FLAG_ACTIVE_LOW

  Set the active state to 'low' (high is the default).
- static GPIOD_API const ::std::bitset< 32 > FLAG_OPEN_SOURCE

  The line is an open-source port.
- static GPIOD_API const ::std::bitset< 32 > FLAG_OPEN_DRAIN

  The line is an open-drain port.
- static GPIOD_API const ::std::bitset< 32 > FLAG_BIAS_DISABLED

  The line has neither pull-up nor pull-down resistor enabled.
- static GPIOD_API const ::std::bitset< 32 > FLAG_BIAS_PULL_DOWN

  The line has a configurable pull-down resistor enabled.
- static GPIOD_API const ::std::bitset< 32 > FLAG_BIAS_PULL_UP

  The line has a configurable pull-up resistor enabled.

6.9.1 Detailed Description

Stores the configuration for line requests.

Definition at line 198 of file gpiod.hpp.

6.9.2 Member Enumeration Documentation

6.9.2.1 anonymous enum

```
anonymous enum :  int
```

Request types.

Enumerator

DIRECTION_AS_IS	Request for values, don't change the direction.
DIRECTION_INPUT	Request for reading line values.
DIRECTION_OUTPUT	Request for driving the GPIO lines.
EVENT_FALLING_EDGE	Listen for falling edge events.
EVENT_RISING_EDGE	Listen for rising edge events.
EVENT_BOTH_EDGES	Listen for all types of events.

Definition at line 203 of file gpiod.hpp.

6.9.3 Field Documentation

6.9.3.1 consumer

```
::std::string gpiod::line_request::consumer
```

Consumer name to pass to the request.

Definition at line 231 of file gpiod.hpp.

6.9.3.2 FLAG_ACTIVE_LOW

```
GPIOD_API const ::std::bitset<32> gpiod::line_request::FLAG_ACTIVE_LOW  [static]
```

Set the active state to 'low' (high is the default).

Definition at line 218 of file gpiod.hpp.

6.9.3.3 FLAG_BIAS_DISABLED

```
GPIOD_API const ::std::bitset<32> gpiod::line_request::FLAG_BIAS_DISABLED  [static]
```

The line has neither pull-up nor pull-down resistor enabled.

Definition at line 224 of file gpiod.hpp.

6.9.3.4 FLAG_BIAS_PULL_DOWN

```
GPIOD_API const ::std::bitset<32> gpiod::line_request::FLAG_BIAS_PULL_DOWN  [static]
```

The line has a configurable pull-down resistor enabled.

Definition at line 226 of file gpiod.hpp.

6.9.3.5 FLAG_BIAS_PULL_UP

```
GPIOD_API const ::std::bitset<32> gpiod::line_request::FLAG_BIAS_PULL_UP  [static]
```

The line has a configurable pull-up resistor enabled.

Definition at line 228 of file gpiod.hpp.

6.9.3.6 FLAG_OPEN_DRAIN

```
GPIOD_API const ::std::bitset<32> gpiod::line_request::FLAG_OPEN_DRAIN  [static]
```

The line is an open-drain port.

Definition at line 222 of file gpiod.hpp.

6.9.3.7 FLAG_OPEN_SOURCE

```
GPIOD_API const ::std::bitset<32> gpiod::line_request::FLAG_OPEN_SOURCE  [static]
```

The line is an open-source port.

Definition at line 220 of file gpiod.hpp.

6.9.3.8 flags

```
::std::bitset<32> gpiod::line_request::flags
```

Additional request flags.

Definition at line 235 of file gpiod.hpp.

6.9.3.9 request_type

```
int gpiod::line_request::request_type
```

Type of the request.

Definition at line 233 of file gpiod.hpp.

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

- gpiod.hpp

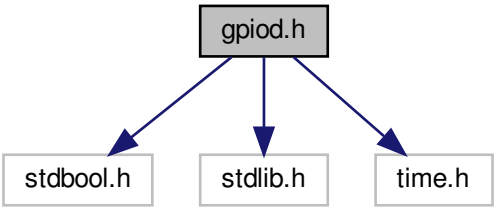
Chapter 7

File Documentation

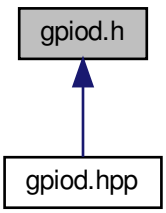
7.1 gpiod.h File Reference

```
#include <stdbool.h>
#include <stdlib.h>
#include <time.h>
```

Include dependency graph for gpiod.h:



This graph shows which files directly or indirectly include this file:



Data Structures

- struct gpiod_line_request_config

  Structure holding configuration of a line request.
- struct gpiod_line_event

  Structure holding event info.

Macros

- #define GPIOD_API __attribute__((visibility("default")))

  Makes symbol visible.
- #define GPIOD_BIT(nr) (1UL << (nr))

  Shift 1 by given offset.

Typedefs

- typedef int(* gpiod_line_bulk_foreach_cb) (struct gpiod_line *, void *)

  Signature of the callback passed to gpiod_line_bulk_foreach_line.

Enumerations

- enum { GPIOD_LINE_BULK_CB_NEXT = 0, **GPIOD_LINE_BULK_CB_STOP** }

  Values returned by the callback passed to gpiod_line_bulk_foreach_line.
- enum { GPIOD_LINE_DIRECTION_INPUT = 1, GPIOD_LINE_DIRECTION_OUTPUT }

  Possible direction settings.
- enum { GPIOD_LINE_DRIVE_PUSH_PULL = 1, GPIOD_LINE_DRIVE_OPEN_DRAIN, GPIOD_LINE_DRIVE_OPEN_SOURCE }

  Possible drive settings.
- enum { GPIOD_LINE_BIAS_UNKNOWN = 1, GPIOD_LINE_BIAS_DISABLED, GPIOD_LINE_BIAS_PULL_UP, GPIOD_LINE_BIAS_PULL_DOWN }

  Possible internal bias settings.
- enum { GPIOD_LINE_REQUEST_DIRECTION_AS_IS = 1, GPIOD_LINE_REQUEST_DIRECTION_INPUT, GPIOD_LINE_REQUEST_DIRECTION_OUTPUT, GPIOD_LINE_REQUEST_EVENT_FALLING_EDGE, GPIOD_LINE_REQUEST_EVENT_RISING_EDGE, GPIOD_LINE_REQUEST_EVENT_BOTH_EDGES }

  Available types of requests.
- enum { GPIOD_LINE_REQUEST_FLAG_OPEN_DRAIN = GPIOD_BIT(0), GPIOD_LINE_REQUEST_FLAG_OPEN_SOURCE = GPIOD_BIT(1), GPIOD_LINE_REQUEST_FLAG_ACTIVE_LOW = GPIOD_BIT(2), GPIOD_LINE_REQUEST_FLAG_BIAS_DISABLED = GPIOD_BIT(3), GPIOD_LINE_REQUEST_FLAG_BIAS_PULL_DOWN = GPIOD_BIT(4), GPIOD_LINE_REQUEST_FLAG_BIAS_PULL_UP = GPIOD_BIT(5) }

  Miscellaneous GPIO request flags.
- enum { GPIOD_LINE_EVENT_RISING_EDGE = 1, GPIOD_LINE_EVENT_FALLING_EDGE }

  Event types.

Functions

- bool gpiod_is_gpiochip_device (const char *path) GPIOD_API

  Check if the file pointed to by path is a GPIO chip character device.
- struct gpiod_chip * gpiod_chip_open (const char *path) GPIOD_API

  Open a gpiochip by path.
- void gpiod_chip_close (struct gpiod_chip *chip) GPIOD_API

  Close a GPIO chip handle and release all allocated resources.
- const char * gpiod_chip_name (struct gpiod_chip *chip) GPIOD_API

  Get the GPIO chip name as represented in the kernel.
- const char * gpiod_chip_label (struct gpiod_chip *chip) GPIOD_API

  Get the GPIO chip label as represented in the kernel.
- unsigned int gpiod_chip_num_lines (struct gpiod_chip *chip) GPIOD_API

  Get the number of GPIO lines exposed by this chip.
- struct gpiod_line * gpiod_chip_get_line (struct gpiod_chip *chip, unsigned int offset) GPIOD_API

  Get the handle to the GPIO line at given offset.
- struct gpiod_line_bulk * gpiod_chip_get_lines (struct gpiod_chip *chip, unsigned int *offsets, unsigned int num_offsets) GPIOD_API

  Retrieve a set of lines and store them in a line bulk object.
- struct gpiod_line_bulk * gpiod_chip_get_all_lines (struct gpiod_chip *chip) GPIOD_API

  Retrieve all lines exposed by a chip and store them in a bulk object.
- struct gpiod_line_bulk * gpiod_chip_find_line (struct gpiod_chip *chip, const char *name) GPIOD_API

  Find all GPIO lines by name among lines exposed by this GPIO chip.
- struct gpiod_line * gpiod_chip_find_line_unique (struct gpiod_chip *chip, const char *name) GPIOD_API

  Find a unique line by name among lines exposed by this GPIO chip.
- struct gpiod_line_bulk * gpiod_line_bulk_new (unsigned int max_lines) GPIOD_API

  Allocate and initialize a new line bulk object.
- void gpiod_line_bulk_reset (struct gpiod_line_bulk *bulk) GPIOD_API

  Reset a bulk object.
- void gpiod_line_bulk_free (struct gpiod_line_bulk *bulk) GPIOD_API

  Release all resources allocated for this bulk object.
- int gpiod_line_bulk_add_line (struct gpiod_line_bulk *bulk, struct gpiod_line *line) GPIOD_API

  Add a single line to a GPIO bulk object.
- struct gpiod_line * gpiod_line_bulk_get_line (struct gpiod_line_bulk *bulk, unsigned int index) GPIOD_API

  Retrieve the line handle from a line bulk object at given index.
- unsigned int gpiod_line_bulk_num_lines (struct gpiod_line_bulk *bulk) GPIOD_API

  Retrieve the number of GPIO lines held by this line bulk object.
- void gpiod_line_bulk_foreach_line (struct gpiod_line_bulk *bulk, gpiod_line_bulk_foreach_cb func, void *data) GPIOD_API

  Iterate over all lines held by this bulk object.
- unsigned int gpiod_line_offset (struct gpiod_line *line) GPIOD_API

  Read the GPIO line offset.
- const char * gpiod_line_name (struct gpiod_line *line) GPIOD_API

  Read the GPIO line name.
- const char * gpiod_line_consumer (struct gpiod_line *line) GPIOD_API

  Read the GPIO line consumer name.
- int gpiod_line_direction (struct gpiod_line *line) GPIOD_API

  Read the GPIO line direction setting.
- bool gpiod_line_is_active_low (struct gpiod_line *line) GPIOD_API

  Check if the signal of this line is inverted.
- int gpiod_line_bias (struct gpiod_line *line) GPIOD_API

Read the GPIO line bias setting.

- bool gpiod_line_is_used (struct gpiod_line *line) GPIOD_API

  Check if the line is currently in use.

- int gpiod_line_drive (struct gpiod_line *line) GPIOD_API

  Read the GPIO line drive setting.

- int gpiod_line_update (struct gpiod_line *line) GPIOD_API

  Re-read the line info.

- struct gpiod_chip * gpiod_line_get_chip (struct gpiod_line *line) GPIOD_API

  Get the handle to the GPIO chip controlling this line.

- int gpiod_line_request (struct gpiod_line *line, const struct gpiod_line_request_config *config, int default_val) GPIOD_API

  Reserve a single line.

- int gpiod_line_request_input (struct gpiod_line *line, const char *consumer) GPIOD_API

  Reserve a single line, set the direction to input.

- int gpiod_line_request_output (struct gpiod_line *line, const char *consumer, int default_val) GPIOD_API

  Reserve a single line, set the direction to output.

- int gpiod_line_request_rising_edge_events (struct gpiod_line *line, const char *consumer) GPIOD_API

  Request rising edge event notifications on a single line.

- int gpiod_line_request_falling_edge_events (struct gpiod_line *line, const char *consumer) GPIOD_API

  Request falling edge event notifications on a single line.

- int gpiod_line_request_both_edges_events (struct gpiod_line *line, const char *consumer) GPIOD_API

  Request all event type notifications on a single line.

- int gpiod_line_request_input_flags (struct gpiod_line *line, const char *consumer, int flags) GPIOD_API

  Reserve a single line, set the direction to input.

- int gpiod_line_request_output_flags (struct gpiod_line *line, const char *consumer, int flags, int default_val) GPIOD_API

  Reserve a single line, set the direction to output.

- int gpiod_line_request_rising_edge_events_flags (struct gpiod_line *line, const char *consumer, int flags) GPIOD_API

  Request rising edge event notifications on a single line.

- int gpiod_line_request_falling_edge_events_flags (struct gpiod_line *line, const char *consumer, int flags) GPIOD_API

  Request falling edge event notifications on a single line.

- int gpiod_line_request_both_edges_events_flags (struct gpiod_line *line, const char *consumer, int flags) GPIOD_API

  Request all event type notifications on a single line.

- int gpiod_line_request_bulk (struct gpiod_line_bulk *bulk, const struct gpiod_line_request_config *config, const int *default_vals) GPIOD_API

  Reserve a set of GPIO lines.

- int gpiod_line_request_bulk_input (struct gpiod_line_bulk *bulk, const char *consumer) GPIOD_API

  Reserve a set of GPIO lines, set the direction to input.

- int gpiod_line_request_bulk_output (struct gpiod_line_bulk *bulk, const char *consumer, const int *default↩_vals) GPIOD_API

  Reserve a set of GPIO lines, set the direction to output.

- int gpiod_line_request_bulk_rising_edge_events (struct gpiod_line_bulk *bulk, const char *consumer) GP↩IOD_API

  Request rising edge event notifications on a set of lines.

- int gpiod_line_request_bulk_falling_edge_events (struct gpiod_line_bulk *bulk, const char *consumer) GP↩IOD_API

  Request falling edge event notifications on a set of lines.

- int gpiod_line_request_bulk_both_edges_events (struct gpiod_line_bulk *bulk, const char *consumer) GP↩IOD_API

Request all event type notifications on a set of lines.

- int gpiod_line_request_bulk_input_flags (struct gpiod_line_bulk *bulk, const char *consumer, int flags) GPIOD_API

  Reserve a set of GPIO lines, set the direction to input.

- int gpiod_line_request_bulk_output_flags (struct gpiod_line_bulk *bulk, const char *consumer, int flags, const int *default_vals) GPIOD_API

  Reserve a set of GPIO lines, set the direction to output.

- int gpiod_line_request_bulk_rising_edge_events_flags (struct gpiod_line_bulk *bulk, const char *consumer, int flags) GPIOD_API

  Request rising edge event notifications on a set of lines.

- int gpiod_line_request_bulk_falling_edge_events_flags (struct gpiod_line_bulk *bulk, const char *consumer, int flags) GPIOD_API

  Request falling edge event notifications on a set of lines.

- int gpiod_line_request_bulk_both_edges_events_flags (struct gpiod_line_bulk *bulk, const char *consumer, int flags) GPIOD_API

  Request all event type notifications on a set of lines.

- void gpiod_line_release (struct gpiod_line *line) GPIOD_API

  Release a previously reserved line.

- void gpiod_line_release_bulk (struct gpiod_line_bulk *bulk) GPIOD_API

  Release a set of previously reserved lines.

- bool gpiod_line_is_requested (struct gpiod_line *line) GPIOD_API

  Check if the calling user has ownership of this line.

- bool gpiod_line_is_free (struct gpiod_line *line) GPIOD_API

  Check if the calling user has neither requested ownership of this line nor configured any event notifications.

- int gpiod_line_get_value (struct gpiod_line *line) GPIOD_API

  Read current value of a single GPIO line.

- int gpiod_line_get_value_bulk (struct gpiod_line_bulk *bulk, int *values) GPIOD_API

  Read current values of a set of GPIO lines.

- int gpiod_line_set_value (struct gpiod_line *line, int value) GPIOD_API

  Set the value of a single GPIO line.

- int gpiod_line_set_value_bulk (struct gpiod_line_bulk *bulk, const int *values) GPIOD_API

  Set the values of a set of GPIO lines.

- int gpiod_line_set_config (struct gpiod_line *line, int direction, int flags, int value) GPIOD_API

  Update the configuration of a single GPIO line.

- int gpiod_line_set_config_bulk (struct gpiod_line_bulk *bulk, int direction, int flags, const int *values) GPIOD_API

  Update the configuration of a set of GPIO lines.

- int gpiod_line_set_flags (struct gpiod_line *line, int flags) GPIOD_API

  Update the configuration flags of a single GPIO line.

- int gpiod_line_set_flags_bulk (struct gpiod_line_bulk *bulk, int flags) GPIOD_API

  Update the configuration flags of a set of GPIO lines.

- int gpiod_line_set_direction_input (struct gpiod_line *line) GPIOD_API

  Set the direction of a single GPIO line to input.

- int gpiod_line_set_direction_input_bulk (struct gpiod_line_bulk *bulk) GPIOD_API

  Set the direction of a set of GPIO lines to input.

- int gpiod_line_set_direction_output (struct gpiod_line *line, int value) GPIOD_API

  Set the direction of a single GPIO line to output.

- int gpiod_line_set_direction_output_bulk (struct gpiod_line_bulk *bulk, const int *values) GPIOD_API

  Set the direction of a set of GPIO lines to output.

- int gpiod_line_event_wait (struct gpiod_line *line, const struct timespec *timeout) GPIOD_API

  Wait for an event on a single line.

- int gpiod_line_event_wait_bulk (struct gpiod_line_bulk *bulk, const struct timespec *timeout, struct gpiod_↩ line_bulk *event_bulk) GPIOD_API

  Wait for events on a set of lines.
- int gpiod_line_event_read (struct gpiod_line *line, struct gpiod_line_event *event) GPIOD_API

  Read next pending event from the GPIO line.
- int gpiod_line_event_read_multiple (struct gpiod_line *line, struct gpiod_line_event *events, unsigned int num_events) GPIOD_API

  Read up to a certain number of events from the GPIO line.
- int gpiod_line_event_get_fd (struct gpiod_line *line) GPIOD_API

  Get the event file descriptor.
- int gpiod_line_event_read_fd (int fd, struct gpiod_line_event *event) GPIOD_API

  Read the last GPIO event directly from a file descriptor.
- int gpiod_line_event_read_fd_multiple (int fd, struct gpiod_line_event *events, unsigned int num_events) G↩ PIOD_API

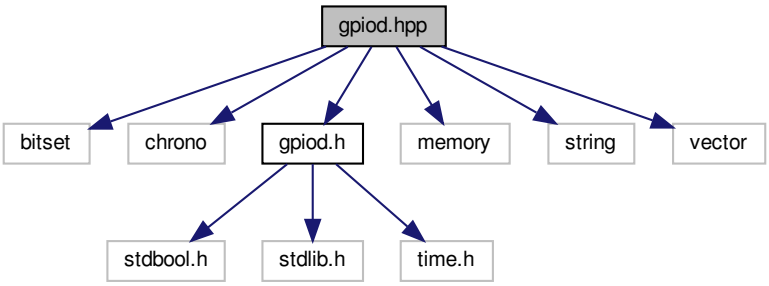
  Read up to a certain number of events directly from a file descriptor.
- const char * gpiod_version_string (void) GPIOD_API

  Get the API version of the library as a human-readable string.

7.2 gpiod.hpp File Reference

```
#include <bitset>
#include <chrono>
#include <gpiod.h>
#include <memory>
#include <string>
#include <vector>
```

Include dependency graph for gpiod.hpp:



Data Structures

- class gpiod::chip

  Represents a GPIO chip.
- struct gpiod::line_request

  Stores the configuration for line requests.
- class gpiod::line

Represents a single GPIO line.

- struct gpiod::line_event

  Describes a single GPIO line event.

- class gpiod::line_bulk

  Represents a set of GPIO lines.

- class gpiod::line_bulk::iterator

  Iterator for iterating over lines held by line_bulk.

- class gpiod::line_iter

  Allows to iterate over all lines owned by a GPIO chip.

Functions

- bool gpiod::is_gpiochip_device (const ::std::string &path) GPIOD_API

  Check if the file pointed to by path is a GPIO chip character device.

- GPIOD_API line_iter gpiod::begin (line_iter iter) noexcept

  Support for range-based loops for line iterators.

- GPIOD_API line_iter gpiod::end (const line_iter &iter) noexcept

  Support for range-based loops for line iterators.

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