My Project

Generated by Doxygen 1.9.8

Chapter 1

Namespace Index

1.1 Namespace List

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

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 3

Class Index

3.1 Class List

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

Chapter 4

File Index

4.1 File List

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

Chapter 5

Namespace Documentation

5.1 anonymous_namespace{async_watch_line_value.cpp} Namespace Reference

Functions

- const ::std::filesystem::path **chip_path** ("/dev/gpiochip0")
- const char * **edge_event_type_str** (const ::gpiod::edge_event &event)

Variables

- const ::gpiod::line::offset **line_offset** = 5

5.2 anonymous_namespace{find_line_by_name.cpp} Namespace Reference

Variables

- const ::std::string **line_name** = "GPIO19"

5.3 anonymous_namespace{get_chip_info.cpp} Namespace Reference

Functions

- const ::std::filesystem::path **chip_path** ("/dev/gpiochip0")

5.4 anonymous_namespace{get_line_info.cpp} Namespace Reference

Functions

- const ::std::filesystem::path **chip_path** ("/dev/gpiochip0")

Variables

- const ::gpiod::line::offset **line_offset** = 3

5.5 anonymous_namespace{get_line_value.cpp} Namespace Reference

Functions

- const ::std::filesystem::path **chip_path** ("/dev/gpiochip0")

Variables

- const ::gpiod::line::offset **line_offset** = 5

5.6 anonymous_namespace{get_multiple_line_values.cpp} Namespace Reference

Functions

- const ::std::filesystem::path **chip_path** ("/dev/gpiochip0")

Variables

- const ::gpiod::line::offsets **line_offsets** = { 5, 3, 7 }

5.7 anonymous_namespace{reconfigure_input_to_output.cpp} Namespace Reference

Functions

- const ::std::filesystem::path **chip_path** ("/dev/gpiochip0")

Variables

- const ::gpiod::line::offset **line_offset** = 5

5.8 anonymous_namespace{toggle_line_value.cpp} Namespace Reference

Functions

- const ::std::filesystem::path **chip_path** ("/dev/gpiochip0")
- ::gpiod::line::value **toggle_value** (::gpiod::line::value v)

Variables

- const ::gpiod::line::offset **line_offset** = 5

5.9 anonymous_namespace{toggle_multiple_line_values.cpp} Namespace Reference

Functions

- const ::std::filesystem::path **chip_path** ("/dev/gpiochip0")
- ::gpiod::line::value **toggle_value** (::gpiod::line::value v)
- void **toggle_values** (::gpiod::line::values &values)
- void **print_values** (::gpiod::line::offsets const &offsets, ::gpiod::line::values const &values)

Variables

- const ::gpiod::line::offsets **line_offsets** = { 5, 3, 7 }

5.10 anonymous_namespace{watch_line_info.cpp} Namespace Reference

Functions

- const ::std::filesystem::path **chip_path** ("/dev/gpiochip0")
- const char * **event_type** (const ::gpiod::info_event &event)

Variables

- const ::gpiod::line::offsets **line_offsets** = { 5, 3, 7 }

5.11 anonymous_namespace{watch_line_rising.cpp} Namespace Reference

Functions

- const ::std::filesystem::path **chip_path** ("/dev/gpiochip0")
- const char * **edge_event_type_str** (const ::gpiod::edge_event &event)

Variables

- const ::gpiod::line::offset **line_offset** = 5

5.12 anonymous_namespace{watch_line_value.cpp} Namespace Reference

Functions

- const ::std::filesystem::path **chip_path** ("/dev/gpiochip0")
- const char * **edge_event_type_str** (const ::gpiod::edge_event &event)

Variables

- const ::gpiod::line::offset **line_offset** = 5

5.13 anonymous_namespace{watch_multiple_line_values.cpp} Namespace Reference

Functions

- const ::std::filesystem::path **chip_path** ("/dev/gpiochip0")
- const char * **edge_event_type_str** (const ::gpiod::edge_event &event)

Variables

- const ::gpiod::line::offsets **line_offsets** = { 5, 3, 7 }

5.14 gpiod::line Namespace Reference

Namespace containing various type definitions for GPIO lines.

Classes

- class offset

  Wrapper around unsigned int for representing line offsets.

Typedefs

- using **offsets** = ::std::vector< offset >

  Vector of line offsets.
- using **values** = ::std::vector< value >

  Vector of line values.
- using **value_mapping** = ::std::pair< offset, value >

  Represents a mapping of a line offset to line logical state.
- using **value_mappings** = ::std::vector< value_mapping >

  Vector of offset->value mappings. Each mapping is defined as a pair of an unsigned and signed integers.

Enumerations

- enum class value { INACTIVE = 0 , ACTIVE = 1 }
  Logical line states.
- enum class direction { AS_IS = 1 , INPUT , OUTPUT }
  Direction settings.
- enum class edge { NONE = 1 , RISING , FALLING , BOTH }
  Edge detection settings.
- enum class bias {
  AS_IS = 1 , UNKNOWN , DISABLED , PULL_UP ,
  PULL_DOWN }
  Internal bias settings.
- enum class drive { PUSH_PULL = 1 , OPEN_DRAIN , OPEN_SOURCE }
  Drive settings.
- enum class clock { MONOTONIC = 1 , REALTIME , **HTE** }
  Event clock settings.

Functions

- ::std::ostream & operator<< (::std::ostream &out, value val)
  Stream insertion operator for logical line values.
- ::std::ostream & operator<< (::std::ostream &out, direction dir)
  Stream insertion operator for direction values.
- ::std::ostream & operator<< (::std::ostream &out, edge edge)
  Stream insertion operator for edge detection values.
- ::std::ostream & operator<< (::std::ostream &out, bias bias)
  Stream insertion operator for bias values.
- ::std::ostream & operator<< (::std::ostream &out, drive drive)
  Stream insertion operator for drive values.
- ::std::ostream & operator<< (::std::ostream &out, clock clock)
  Stream insertion operator for event clock values.
- ::std::ostream & operator<< (::std::ostream &out, const values &vals)
  Stream insertion operator for the list of output values.
- ::std::ostream & operator<< (::std::ostream &out, const offsets &offs)
  Stream insertion operator for the list of line offsets.
- ::std::ostream & operator<< (::std::ostream &out, const value_mapping &mapping)
  Stream insertion operator for the offset-to-value mapping.
- ::std::ostream & operator<< (::std::ostream &out, const value_mappings &mappings)
  Stream insertion operator for the list of offset-to-value mappings.

5.14.1 Detailed Description

Namespace containing various type definitions for GPIO lines.

5.14.2 Enumeration Type Documentation

5.14.2.1 bias

```
enum class gpiod::line::bias  [strong]
```

Internal bias settings.

Enumerator

AS_IS	Don't change the bias setting when applying line config.
UNKNOWN	The internal bias state is unknown.
DISABLED	The internal bias is disabled.
PULL_UP	The internal pull-up bias is enabled.
PULL_DOWN	The internal pull-down bias is enabled.

5.14.2.2 clock

`enum class gpiod::line::clock [strong]`

Event clock settings.

Enumerator

MONOTONIC	Line uses the monotonic clock for edge event timestamps.
REALTIME	Line uses the realtime clock for edge event timestamps.

5.14.2.3 direction

`enum class gpiod::line::direction [strong]`

Direction settings.

Enumerator

AS_IS	Request the line(s), but don't change current direction.
INPUT	Direction is input - we're reading the state of a GPIO line.
OUTPUT	Direction is output - we're driving the GPIO line.

5.14.2.4 drive

`enum class gpiod::line::drive [strong]`

Drive settings.

Enumerator

PUSH_PULL	Drive setting is push-pull.
OPEN_DRAIN	Line output is open-drain.
OPEN_SOURCE	Line output is open-source.

5.14.2.5 edge

```
enum class gpiod::line::edge  [strong]
```

Edge detection settings.

Enumerator

NONE	Line edge detection is disabled.
RISING	Line detects rising edge events.
FALLING	Line detect falling edge events.
BOTH	Line detects both rising and falling edge events.

5.14.2.6 value

```
enum class gpiod::line::value  [strong]
```

Logical line states.

Enumerator

INACTIVE	Line is inactive.
ACTIVE	Line is active.

5.14.3 Function Documentation

5.14.3.1 operator<<() [1/10]

```
::std::ostream & gpiod::line::operator<< (
            ::std::ostream & out,
            bias bias )
```

Stream insertion operator for bias values.

Parameters

out	Output stream.
bias	Value to insert into the output stream in a human-readable form.

Returns

Reference to out.

5.14.3.2 operator<<() [2/10]

```
::std::ostream & gpiod::line::operator<< (
            ::std::ostream & out,
            clock clock )
```

Stream insertion operator for event clock values.

Parameters

out	Output stream.
clock	Value to insert into the output stream in a human-readable form.

Returns

Reference to out.

5.14.3.3 operator<<() [3/10]

```
::std::ostream & gpiod::line::operator<< (
            ::std::ostream & out,
            const offsets & offs )
```

Stream insertion operator for the list of line offsets.

Parameters

out	Output stream.
offs	Object to insert into the output stream in a human-readable form.

Returns

Reference to out.

5.14.3.4 operator<<() [4/10]

```
::std::ostream & gpiod::line::operator<< (
            ::std::ostream & out,
            const value_mapping & mapping )
```

Stream insertion operator for the offset-to-value mapping.

Parameters

out	Output stream.
mapping	Value to insert into the output stream in a human-readable form.

Returns

Reference to out.

5.14.3.5 operator<<() [5/10]

```
::std::ostream & gpiod::line::operator<< (
```

```
            ::std::ostream & out,
            const value_mappings & mappings )
```

Stream insertion operator for the list of offset-to-value mappings.

Parameters

out	Output stream.
mappings	Object to insert into the output stream in a human-readable form.

Returns

Reference to out.

5.14.3.6 operator<<() [6/10]

```
::std::ostream & gpiod::line::operator<< (
            ::std::ostream & out,
            const values & vals )
```

Stream insertion operator for the list of output values.

Parameters

out	Output stream.
vals	Object to insert into the output stream in a human-readable form.

Returns

Reference to out.

5.14.3.7 operator<<() [7/10]

```
::std::ostream & gpiod::line::operator<< (
            ::std::ostream & out,
            direction dir )
```

Stream insertion operator for direction values.

Parameters

out	Output stream.
dir	Value to insert into the output stream in a human-readable form.

Returns

Reference to out.

5.14.3.8 operator<<() [8/10]

```
::std::ostream & gpiod::line::operator<< (
            ::std::ostream & out,
            drive drive )
```

Stream insertion operator for drive values.

Parameters

out	Output stream.
drive	Value to insert into the output stream in a human-readable form.

Returns

Reference to out.

5.14.3.9 operator<<() [9/10]

```
::std::ostream & gpiod::line::operator<< (
            ::std::ostream & out,
            edge edge )
```

Stream insertion operator for edge detection values.

Parameters

out	Output stream.
edge	Value to insert into the output stream in a human-readable form.

Returns

Reference to out.

5.14.3.10 operator<<() [10/10]

```
::std::ostream & gpiod::line::operator<< (
            ::std::ostream & out,
            value val )
```

Stream insertion operator for logical line values.

Parameters

out	Output stream.
val	Value to insert into the output stream in a human-readable form.

Returns

Reference to out.

Chapter 6

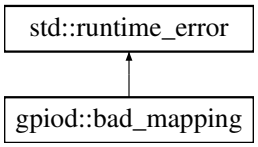
Class Documentation

6.1 gpiod::bad_mapping Class Reference

Exception thrown when the core C library returns an invalid value for any of the line_info properties.

`#include <exception.hpp>`

Inheritance diagram for gpiod::bad_mapping:



Public Member Functions

- bad_mapping (const ::std::string &what)
  Constructor.
- bad_mapping (const bad_mapping &other) noexcept
  Copy constructor.
- bad_mapping (bad_mapping &&other) noexcept
  Move constructor.
- bad_mapping & operator= (const bad_mapping &other) noexcept
  Assignment operator.
- bad_mapping & operator= (bad_mapping &&other) noexcept
  Move assignment operator.

6.1.1 Detailed Description

Exception thrown when the core C library returns an invalid value for any of the line_info properties.

6.1.2 Constructor & Destructor Documentation

6.1.2.1 bad_mapping() [1/3]

```
gpiod::bad_mapping::bad_mapping (
            const ::std::string & what )  [explicit]
```

Constructor.

Parameters

what	Human readable reason for error.

6.1.2.2 bad_mapping() [2/3]

```
gpiod::bad_mapping::bad_mapping (
            const bad_mapping & other )  [noexcept]
```

Copy constructor.

Parameters

other	Object to copy from.

6.1.2.3 bad_mapping() [3/3]

```
gpiod::bad_mapping::bad_mapping (
            bad_mapping && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.1.3 Member Function Documentation

6.1.3.1 operator=() [1/2]

```
bad_mapping & gpiod::bad_mapping::operator= (
            bad_mapping && other )  [noexcept]
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

6.1.3.2 operator=() [2/2]

```
bad_mapping & gpiod::bad_mapping::operator= (
```

```
const bad_mapping & other )  [noexcept]
```

Assignment operator.

Parameters

other	Object to copy from.

Returns

Reference to self.

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

- gpiodcxx/exception.hpp

6.2 gpiod::chip Class Reference

Represents a GPIO chip.

`#include <chip.hpp>`

Public Member Functions

- chip (const ::std::filesystem::path &path)
  Instantiates a new chip object by opening the device file indicated by the `path` argument.
- chip (chip &&other) noexcept
  Move constructor.
- chip & **operator=** (const chip &other)=delete
- chip & operator= (chip &&other) noexcept
  Move assignment operator.
- operator bool () const noexcept
  Check if this object is valid.
- void close ()
  Close the GPIO chip device file and free associated resources.
- ::std::filesystem::path path () const
  Get the filesystem path that was used to open this GPIO chip.
- chip_info get_info () const
  Get information about the chip.
- line_info get_line_info (line::offset offset) const
  Retrieve the current snapshot of line information for a single line.
- line_info watch_line_info (line::offset offset) const
  Wrapper around gpiod::chip::get_line_info that retrieves the line info and starts watching the line for changes.
- void unwatch_line_info (line::offset offset) const
  Stop watching the line at given offset for info events.
- int fd () const
  Get the file descriptor associated with this chip.
- bool wait_info_event (const ::std::chrono::nanoseconds &timeout) const
  Wait for line status events on any of the watched lines exposed by this chip.
- info_event read_info_event () const
  Read a single line status change event from this chip.
- int get_line_offset_from_name (const ::std::string &name) const
  Map a GPIO line's name to its offset within the chip.
- request_builder prepare_request ()
  Create a request_builder associated with this chip.

Private Member Functions

- **chip** (const chip &other)

Private Attributes

- ::std::shared_ptr< impl > **_m_priv**
- friend **request_builder**

6.2.1 Detailed Description

Represents a GPIO chip.

6.2.2 Constructor & Destructor Documentation

6.2.2.1 chip() [1/2]

```
gpiod::chip::chip (
            const ::std::filesystem::path & path )  [explicit]
```

Instantiates a new chip object by opening the device file indicated by the `path` argument.

Parameters

path	Path to the device file to open.

6.2.2.2 chip() [2/2]

```
gpiod::chip::chip (
            chip && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.2.3 Member Function Documentation

6.2.3.1 close()

```
void gpiod::chip::close ( )
```

Close the GPIO chip device file and free associated resources.

Note

The chip object can live after calling this method but any of the chip's mutators will throw a logic_error exception.

6.2.3.2 fd()

```
int gpiod::chip::fd ( ) const
```

Get the file descriptor associated with this chip.

Returns

File descriptor number.

6.2.3.3 get_info()

```
chip_info gpiod::chip::get_info ( ) const
```

Get information about the chip.

Returns

New chip_info object.

6.2.3.4 get_line_info()

```
line_info gpiod::chip::get_line_info (
            line::offset offset ) const
```

Retrieve the current snapshot of line information for a single line.

Parameters

offset	Offset of the line to get the info for.

Returns

New gpiod::line_info object.

6.2.3.5 get_line_offset_from_name()

```
int gpiod::chip::get_line_offset_from_name (
            const ::std::string & name ) const
```

Map a GPIO line's name to its offset within the chip.

Parameters

name	Name of the GPIO line to map.

Returns

Offset of the line within the chip or -1 if the line with given name is not exposed by this chip.

6.2.3.6 operator bool()

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

Check if this object is valid.

Returns

True if this object's methods can be used, false otherwise. False usually means the chip was closed. If the user calls any of the methods of this class on an object for which this operator returned false, a logic_error will be thrown.

6.2.3.7 operator=()

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

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

6.2.3.8 path()

```
::std::filesystem::path gpiod::chip::path ( ) const
```

Get the filesystem path that was used to open this GPIO chip.

Returns

Path to the underlying character device file.

6.2.3.9 prepare_request()

```
request_builder gpiod::chip::prepare_request ( )
```

Create a request_builder associated with this chip.

Returns

New request_builder object.

6.2.3.10 read_info_event()

```
info_event gpiod::chip::read_info_event ( ) const
```

Read a single line status change event from this chip.

Returns

New info_event object.

6.2.3.11 unwatch_line_info()

```
void gpiod::chip::unwatch_line_info (
            line::offset offset ) const
```

Stop watching the line at given offset for info events.

Parameters

offset	Offset of the line to get the info for.

6.2.3.12 wait_info_event()

```
bool gpiod::chip::wait_info_event (
            const ::std::chrono::nanoseconds & timeout ) const
```

Wait for line status events on any of the watched lines exposed by this chip.

Parameters

timeout	Wait time limit in nanoseconds. If set to 0, the function returns immediately. If set to a negative number, the function blocks indefinitely until an event becomes available.

Returns

True if at least one event is ready to be read. False if the wait timed out.

6.2.3.13 watch_line_info()

```
line_info gpiod::chip::watch_line_info (
            line::offset offset ) const
```

Wrapper around gpiod::chip::get_line_info that retrieves the line info and starts watching the line for changes.

Parameters

offset	Offset of the line to get the info for.

Returns

New gpiod::line_info object.

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

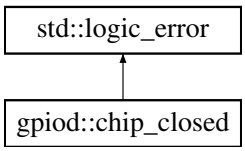
- gpiodcxx/chip.hpp

6.3 gpiod::chip_closed Class Reference

Exception thrown when an already closed chip is used.

`#include <exception.hpp>`

Inheritance diagram for gpiod::chip_closed:



Public Member Functions

- chip_closed (const ::std::string &what)
  Constructor.
- chip_closed (const chip_closed &other) noexcept
  Copy constructor.
- chip_closed (chip_closed &&other) noexcept
  Move constructor.
- chip_closed & operator= (const chip_closed &other) noexcept
  Assignment operator.
- chip_closed & operator= (chip_closed &&other) noexcept
  Move assignment operator.

6.3.1 Detailed Description

Exception thrown when an already closed chip is used.

6.3.2 Constructor & Destructor Documentation

6.3.2.1 chip_closed() [1/3]

```
gpiod::chip_closed::chip_closed (
            const ::std::string & what )  [explicit]
```

Constructor.

Parameters

what	Human readable reason for error.

6.3.2.2 chip_closed() [2/3]

```
gpiod::chip_closed::chip_closed (
            const chip_closed & other )  [noexcept]
```

Copy constructor.

Parameters

other	Object to copy from.

6.3.2.3 chip_closed() [3/3]

```
gpiod::chip_closed::chip_closed (
            chip_closed && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.3.3 Member Function Documentation

6.3.3.1 operator=() [1/2]

```
chip_closed & gpiod::chip_closed::operator= (
            chip_closed && other )  [noexcept]
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

6.3.3.2 operator=() [2/2]

```
chip_closed & gpiod::chip_closed::operator= (
            const chip_closed & other )  [noexcept]
```

Assignment operator.

Parameters

other	Object to copy from.

Returns

Reference to self.

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

- gpiodcxx/exception.hpp

6.4 gpiod::chip_info Class Reference

Represents an immutable snapshot of GPIO chip information.

`#include <chip-info.hpp>`

Public Member Functions

- chip_info (const chip_info &other)
  Copy constructor.
- chip_info (chip_info &&other) noexcept
  Move constructor.
- chip_info & operator= (const chip_info &other)
  Assignment operator.
- chip_info & operator= (chip_info &&other) noexcept
  Move assignment operator.
- ::std::string name () const noexcept
  Get the name of this GPIO chip.
- ::std::string label () const noexcept
  Get the label of this GPIO chip.
- ::std::size_t num_lines () const noexcept
  Return the number of lines exposed by this chip.

Private Attributes

- ::std::shared_ptr< impl > **_m_priv**
- friend **chip**

6.4.1 Detailed Description

Represents an immutable snapshot of GPIO chip information.

6.4.2 Constructor & Destructor Documentation

6.4.2.1 chip_info() [1/2]

```
gpiod::chip_info::chip_info (
            const chip_info & other )
```

Copy constructor.

Parameters

other	Object to copy.

6.4.2.2 chip_info() [2/2]

```
gpiod::chip_info::chip_info (
            chip_info && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.4.3 Member Function Documentation

6.4.3.1 label()

```
::std::string gpiod::chip_info::label ( ) const  [noexcept]
```

Get the label of this GPIO chip.

Returns

String containing the chip name.

6.4.3.2 name()

```
::std::string gpiod::chip_info::name ( ) const  [noexcept]
```

Get the name of this GPIO chip.

Returns

String containing the chip name.

6.4.3.3 num_lines()

```
::std::size_t gpiod::chip_info::num_lines ( ) const  [noexcept]
```

Return the number of lines exposed by this chip.

Returns

Number of lines.

6.4.3.4 operator=() [1/2]

```
chip_info & gpiod::chip_info::operator= (
            chip_info && other )  [noexcept]
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

6.4.3.5 operator=() [2/2]

```
chip_info & gpiod::chip_info::operator= (
            const chip_info & other )
```

Assignment operator.

Parameters

other	Object to copy.

Returns

Reference to self.

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

- gpiodcxx/chip-info.hpp

6.5 gpiod::edge_event Class Reference

Immutable object containing data about a single edge event.

`#include <edge-event.hpp>`

Public Types

- enum class event_type { RISING_EDGE = 1 , FALLING_EDGE }
  Edge event types.

Public Member Functions

- edge_event (const edge_event &other)
  Copy constructor.
- edge_event (edge_event &&other) noexcept
  Move constructor.
- edge_event & operator= (const edge_event &other)
  Copy assignment operator.
- edge_event & operator= (edge_event &&other) noexcept
  Move assignment operator.
- event_type type () const
  Retrieve the event type.
- timestamp timestamp_ns () const noexcept
  Retrieve the event time-stamp.
- line::offset line_offset () const noexcept
  Read the offset of the line on which this event was registered.
- unsigned long global_seqno () const noexcept
  Get the global sequence number of this event.
- unsigned long line_seqno () const noexcept
  Get the event sequence number specific to the concerned line.

Private Attributes

- ::std::shared_ptr< impl > **_m_priv**
- friend **edge_event_buffer**

6.5.1 Detailed Description

Immutable object containing data about a single edge event.

6.5.2 Member Enumeration Documentation

6.5.2.1 event_type

`enum class gpiod::edge_event::event_type [strong]`

Edge event types.

Enumerator

RISING_EDGE	This is a rising edge event.
FALLING_EDGE	This is falling edge event.

6.5.3 Constructor & Destructor Documentation

6.5.3.1 edge_event() [1/2]

```
gpiod::edge_event::edge_event (
            const edge_event & other )
```

Copy constructor.

Parameters

other	Object to copy.

6.5.3.2 edge_event() [2/2]

```
gpiod::edge_event::edge_event (
            edge_event && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.5.4 Member Function Documentation

6.5.4.1 global_seqno()

```
unsigned long gpiod::edge_event::global_seqno ( ) const  [noexcept]
```

Get the global sequence number of this event.

Returns

Sequence number of the event relative to all lines in the associated line request.

6.5.4.2 line_offset()

```
line::offset gpiod::edge_event::line_offset ( ) const  [noexcept]
```

Read the offset of the line on which this event was registered.

Returns

Line offset.

6.5.4.3 line_seqno()

```
unsigned long gpiod::edge_event::line_seqno ( ) const  [noexcept]
```

Get the event sequence number specific to the concerned line.

Returns

Sequence number of the event relative to this line within the lifetime of the associated line request.

6.5.4.4 operator=() [1/2]

```
edge_event & gpiod::edge_event::operator= (
            const edge_event & other )
```

Copy assignment operator.

Parameters

other	Object to copy.

Returns

Reference to self.

6.5.4.5 operator=() [2/2]

```
edge_event & gpiod::edge_event::operator= (
            edge_event && other )  [noexcept]
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

6.5.4.6 timestamp_ns()

```
timestamp gpiod::edge_event::timestamp_ns ( ) const  [noexcept]
```

Retrieve the event time-stamp.

Returns

Time-stamp in nanoseconds as registered by the kernel using the configured edge event clock.

6.5.4.7 type()

```
event_type gpiod::edge_event::type ( ) const
```

Retrieve the event type.

Returns

Event type (rising or falling edge).

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

- gpiodcxx/edge-event.hpp

6.6 gpiod::edge_event_buffer Class Reference

Object into which edge events are read for better performance.

```
#include <edge-event-buffer.hpp>
```

Public Types

- using **const_iterator** = ::std::vector< edge_event >::const_iterator

  Constant iterator for iterating over edge events stored in the buffer.

Public Member Functions

- edge_event_buffer (::std::size_t capacity=64)

  Constructor. Creates a new edge event buffer with given capacity.
- **edge_event_buffer** (const edge_event_buffer &other)=delete
- edge_event_buffer (edge_event_buffer &&other) noexcept

  Move constructor.
- edge_event_buffer & **operator=** (const edge_event_buffer &other)=delete
- edge_event_buffer & operator= (edge_event_buffer &&other) noexcept

  Move assignment operator.
- const edge_event & get_event (unsigned int index) const

  Get the constant reference to the edge event at given index.
- ::std::size_t num_events () const

  Get the number of edge events currently stored in the buffer.
- ::std::size_t capacity () const noexcept

  Maximum capacity of the buffer.
- const_iterator begin () const noexcept

  Get a constant iterator to the first edge event currently stored in the buffer.
- const_iterator end () const noexcept

  Get a constant iterator to the element after the last edge event in the buffer.

Private Attributes

- ::std::unique_ptr< impl > **_m_priv**
- friend **line_request**

6.6.1 Detailed Description

Object into which edge events are read for better performance.

The edge_event_buffer allows reading edge_event objects into an existing buffer which improves the performance by avoiding needless memory allocations.

6.6.2 Constructor & Destructor Documentation

6.6.2.1 edge_event_buffer() [1/2]

```
gpiod::edge_event_buffer::edge_event_buffer (
            ::std::size_t capacity = 64 )  [explicit]
```

Constructor. Creates a new edge event buffer with given capacity.

Parameters

capacity	Capacity of the new buffer.

6.6.2.2 edge_event_buffer() [2/2]

```
gpiod::edge_event_buffer::edge_event_buffer (
            edge_event_buffer && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.6.3 Member Function Documentation

6.6.3.1 begin()

```
const_iterator gpiod::edge_event_buffer::begin ( ) const  [noexcept]
```

Get a constant iterator to the first edge event currently stored in the buffer.

Returns

Constant iterator to the first element.

6.6.3.2 capacity()

```
::std::size_t gpiod::edge_event_buffer::capacity ( ) const  [noexcept]
```

Maximum capacity of the buffer.

Returns

Buffer capacity.

6.6.3.3 end()

```
const_iterator gpiod::edge_event_buffer::end ( ) const  [noexcept]
```

Get a constant iterator to the element after the last edge event in the buffer.

Returns

Constant iterator to the element after the last edge event.

6.6.3.4 get_event()

```
const edge_event & gpiod::edge_event_buffer::get_event (
            unsigned int index ) const
```

Get the constant reference to the edge event at given index.

Parameters

index	Index of the event in the buffer.

Returns

Constant reference to the edge event.

6.6.3.5 num_events()

```
::std::size_t gpiod::edge_event_buffer::num_events ( ) const
```

Get the number of edge events currently stored in the buffer.

Returns

Number of edge events in the buffer.

6.6.3.6 operator=()

```
edge_event_buffer & gpiod::edge_event_buffer::operator= (
            edge_event_buffer && other )  [noexcept]
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

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

- gpiodcxx/edge-event-buffer.hpp

6.7 gpiod::info_event Class Reference

Immutable object containing data about a single line info event.

`#include <info-event.hpp>`

Public Types

- enum class event_type { LINE_REQUESTED = 1 , LINE_RELEASED , LINE_CONFIG_CHANGED }
  Types of info events.

Public Member Functions

- info_event (const info_event &other)
  Copy constructor.
- info_event (info_event &&other) noexcept
  Move constructor.
- info_event & operator= (const info_event &other)
  Copy assignment operator.
- info_event & operator= (info_event &&other) noexcept
  Move assignment operator.
- event_type type () const
  Type of this event.
- ::std::uint64_t timestamp_ns () const noexcept
  Timestamp of the event as returned by the kernel.
- const line_info & get_line_info () const noexcept
  Get the new line information.

Private Attributes

- ::std::shared_ptr< impl > **_m_priv**
- friend **chip**

6.7.1 Detailed Description

Immutable object containing data about a single line info event.

6.7.2 Member Enumeration Documentation

6.7.2.1 event_type

`enum class gpiod::info_event::event_type [strong]`

Types of info events.

Enumerator

LINE_REQUESTED	Line has been requested.
LINE_RELEASED	Previously requested line has been released.
LINE_CONFIG_CHANGED	Line configuration has changed.

6.7.3 Constructor & Destructor Documentation

6.7.3.1 info_event() [1/2]

```
gpiod::info_event::info_event (
            const info_event & other )
```

Copy constructor.

Parameters

other	Object to copy.

6.7.3.2 info_event() [2/2]

```
gpiod::info_event::info_event (
            info_event && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.7.4 Member Function Documentation

6.7.4.1 get_line_info()

```
const line_info & gpiod::info_event::get_line_info ( ) const  [noexcept]
```

Get the new line information.

Returns

Constant reference to the line info object containing the line data as read at the time of the info event.

6.7.4.2 operator=() [1/2]

```
info_event & gpiod::info_event::operator= (
            const info_event & other )
```

Copy assignment operator.

Parameters

other	Object to copy.

Returns

Reference to self.

6.7.4.3 operator=() [2/2]

```
info_event & gpiod::info_event::operator= (
            info_event && other )  [noexcept]
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

6.7.4.4 timestamp_ns()

```
::std::uint64_t gpiod::info_event::timestamp_ns ( ) const  [noexcept]
```

Timestamp of the event as returned by the kernel.

Returns

Timestamp as a 64-bit unsigned integer.

6.7.4.5 type()

```
event_type gpiod::info_event::type ( ) const
```

Type of this event.

Returns

Event type.

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

- gpiodcxx/info-event.hpp

6.8 gpiod::line_config Class Reference

Contains a set of line config options used in line requests and reconfiguration.

`#include <line-config.hpp>`

Public Member Functions

- **line_config** (const line_config &other)=delete
- line_config (line_config &&other) noexcept

  Move constructor.
- line_config & operator= (line_config &&other) noexcept

  Move assignment operator.
- line_config & reset () noexcept

  Reset the line config object.
- line_config & add_line_settings (line::offset offset, const line_settings &settings)

  Add line settings for a single offset.
- line_config & add_line_settings (const line::offsets &offsets, const line_settings &settings)

  Add line settings for a set of offsets.
- line_config & set_output_values (const line::values &values)

  Set output values for a number of lines.
- ::std::map< line::offset, line_settings > get_line_settings () const

  Get a mapping of offsets to line settings stored by this object.

Private Member Functions

- line_config & **operator=** (const line_config &other)

Private Attributes

- ::std::shared_ptr< impl > **_m_priv**
- friend **line_request**
- friend **request_builder**

6.8.1 Detailed Description

Contains a set of line config options used in line requests and reconfiguration.

6.8.2 Constructor & Destructor Documentation

6.8.2.1 line_config()

```
gpiod::line_config::line_config (
            line_config && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.8.3 Member Function Documentation

6.8.3.1 add_line_settings() [1/2]

```
line_config & gpiod::line_config::add_line_settings (
            const line::offsets & offsets,
            const line_settings & settings )
```

Add line settings for a set of offsets.

Parameters

offsets	Offsets for which to add settings.
settings	Line settings to add.

Returns

Reference to self.

6.8.3.2 add_line_settings() [2/2]

```
line_config & gpiod::line_config::add_line_settings (
            line::offset offset,
            const line_settings & settings )
```

Add line settings for a single offset.

Parameters

offset	Offset for which to add settings.
settings	Line settings to add.

Returns

Reference to self.

6.8.3.3 get_line_settings()

```
::std::map< line::offset, line_settings > gpiod::line_config::get_line_settings ( ) const
```

Get a mapping of offsets to line settings stored by this object.

Returns

Map in which keys represent line offsets and values are the settings corresponding with them.

6.8.3.4 operator=()

```
line_config & gpiod::line_config::operator= (
            line_config && other )  [noexcept]
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

6.8.3.5 reset()

```
line_config & gpiod::line_config::reset ( )  [noexcept]
```

Reset the line config object.

Returns

Reference to self.

6.8.3.6 set_output_values()

```
line_config & gpiod::line_config::set_output_values (
            const line::values & values )
```

Set output values for a number of lines.

Parameters

values	Buffer containing the output values.

Returns

Reference to self.

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

- gpiodcxx/line-config.hpp

6.9 gpiod::line_info Class Reference

Contains an immutable snapshot of the line's state at the time when the object of this class was instantiated.

`#include <line-info.hpp>`

Public Member Functions

- line_info (const line_info &other) noexcept
  Copy constructor.
- line_info (line_info &&other) noexcept
  Move constructor.
- line_info & operator= (const line_info &other) noexcept
  Copy assignment operator.
- line_info & operator= (line_info &&other) noexcept
  Move assignment operator.
- line::offset offset () const noexcept
  Get the hardware offset of the line.
- ::std::string name () const noexcept
  Get the GPIO line name.
- bool used () const noexcept
  Check if the line is currently in use.
- ::std::string consumer () const noexcept
  Read the GPIO line consumer name.
- line::direction direction () const
  Read the GPIO line direction setting.
- line::edge edge_detection () const
  Read the current edge detection setting of this line.
- line::bias bias () const
  Read the GPIO line bias setting.
- line::drive drive () const
  Read the GPIO line drive setting.
- bool active_low () const noexcept
  Check if the signal of this line is inverted.
- bool debounced () const noexcept
  Check if this line is debounced (either by hardware or by the kernel software debouncer).
- ::std::chrono::microseconds debounce_period () const noexcept
  Read the current debounce period in microseconds.
- line::clock event_clock () const
  Read the current event clock setting used for edge event timestamps.

Private Attributes

- ::std::shared_ptr< impl > **_m_priv**
- friend **chip**
- friend **info_event**

6.9.1 Detailed Description

Contains an immutable snapshot of the line's state at the time when the object of this class was instantiated.

6.9.2 Constructor & Destructor Documentation

6.9.2.1 line_info() [1/2]

```
gpiod::line_info::line_info (
            const line_info & other )  [noexcept]
```

Copy constructor.

Parameters

other	Object to copy.

6.9.2.2 line_info() [2/2]

```
gpiod::line_info::line_info (
            line_info && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.9.3 Member Function Documentation

6.9.3.1 active_low()

```
bool gpiod::line_info::active_low ( ) const  [noexcept]
```

Check if the signal of this line is inverted.

Returns

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

6.9.3.2 bias()

```
line::bias gpiod::line_info::bias ( ) const
```

Read the GPIO line bias setting.

Returns

Returns BIAS_PULL_UP, BIAS_PULL_DOWN, BIAS_DISABLE or BIAS_UNKNOWN.

6.9.3.3 consumer()

```
::std::string gpiod::line_info::consumer ( ) const  [noexcept]
```

Read the GPIO line consumer name.

Returns

Name of the GPIO consumer name as it is represented in the kernel. This routine returns an empty string if the line is not used.

6.9.3.4 debounce_period()

```
::std::chrono::microseconds gpiod::line_info::debounce_period ( ) const  [noexcept]
```

Read the current debounce period in microseconds.

Returns

Current debounce period in microseconds, 0 if the line is not debounced.

6.9.3.5 debounced()

```
bool gpiod::line_info::debounced ( ) const  [noexcept]
```

Check if this line is debounced (either by hardware or by the kernel software debouncer).

Returns

True if the line is debounced, false otherwise.

6.9.3.6 direction()

```
line::direction gpiod::line_info::direction ( ) const
```

Read the GPIO line direction setting.

Returns

Returns DIRECTION_INPUT or DIRECTION_OUTPUT.

6.9.3.7 drive()

```
line::drive gpiod::line_info::drive ( ) const
```

Read the GPIO line drive setting.

Returns

Returns DRIVE_PUSH_PULL, DRIVE_OPEN_DRAIN or DRIVE_OPEN_SOURCE.

6.9.3.8 edge_detection()

```
line::edge gpiod::line_info::edge_detection ( ) const
```

Read the current edge detection setting of this line.

Returns

Returns EDGE_NONE, EDGE_RISING, EDGE_FALLING or EDGE_BOTH.

6.9.3.9 event_clock()

```
line::clock gpiod::line_info::event_clock ( ) const
```

Read the current event clock setting used for edge event timestamps.

Returns

Returns MONOTONIC, REALTIME or HTE.

6.9.3.10 name()

```
::std::string gpiod::line_info::name ( ) const  [noexcept]
```

Get the GPIO line name.

Returns

Name of the GPIO line as it is represented in the kernel. This routine returns an empty string if the line is unnamed.

6.9.3.11 offset()

```
line::offset gpiod::line_info::offset ( ) const  [noexcept]
```

Get the hardware offset of the line.

Returns

Offset of the line within the parent chip.

6.9.3.12 operator=() [1/2]

```
line_info & gpiod::line_info::operator= (
            const line_info & other )  [noexcept]
```

Copy assignment operator.

Parameters

other	Object to copy.

Returns

Reference to self.

6.9.3.13 operator=() [2/2]

```
line_info & gpiod::line_info::operator= (
            line_info && other )  [noexcept]
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

6.9.3.14 used()

```
bool gpiod::line_info::used ( ) const  [noexcept]
```

Check if the line is currently in use.

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.

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

- gpiodcxx/line-info.hpp

6.10 gpiod::line_request Class Reference

Stores the context of a set of requested GPIO lines.

```
#include <line-request.hpp>
```

Public Member Functions

- **line_request** (const line_request &other)=delete
- line_request (line_request &&other) noexcept

  Move constructor.
- line_request & **operator=** (const line_request &other)=delete
- line_request & operator= (line_request &&other) noexcept

  Move assignment operator.
- operator bool () const noexcept

  Check if this object is valid.
- void release ()

  Release the requested lines and free all associated resources.
- ::std::string chip_name () const

  Get the name of the chip this request was made on.
- ::std::size_t num_lines () const

  Get the number of requested lines.
- line::offsets offsets () const

  Get the list of offsets of requested lines.
- line::value get_value (line::offset offset)

  Get the value of a single requested line.
- line::values get_values (const line::offsets &offsets)

  Get the values of a subset of requested lines.
- line::values get_values ()

  Get the values of all requested lines.
- void get_values (const line::offsets &offsets, line::values &values)

  Get the values of a subset of requested lines into a vector supplied by the caller.
- void get_values (line::values &values)

  Get the values of all requested lines.
- line_request & set_value (line::offset offset, line::value value)

  Set the value of a single requested line.
- line_request & set_values (const line::value_mappings &values)

  Set the values of a subset of requested lines.
- line_request & set_values (const line::offsets &offsets, const line::values &values)

  Set the values of a subset of requested lines.
- line_request & set_values (const line::values &values)

  Set the values of all requested lines.
- line_request & reconfigure_lines (const line_config &config)

  Apply new config options to requested lines.
- int fd () const

  Get the file descriptor number associated with this line request.
- bool wait_edge_events (const ::std::chrono::nanoseconds &timeout) const

  Wait for edge events on any of the lines requested with edge detection enabled.
- ::std::size_t read_edge_events (edge_event_buffer &buffer)

  Read a number of edge events from this request up to the maximum capacity of the buffer.
- ::std::size_t read_edge_events (edge_event_buffer &buffer, ::std::size_t max_events)

  Read a number of edge events from this request.

Private Attributes

- ::std::unique_ptr< impl > **_m_priv**
- friend **request_builder**

6.10.1 Detailed Description

Stores the context of a set of requested GPIO lines.

6.10.2 Constructor & Destructor Documentation

6.10.2.1 line_request()

```
gpiod::line_request::line_request (
            line_request && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.10.3 Member Function Documentation

6.10.3.1 chip_name()

```
::std::string gpiod::line_request::chip_name ( ) const
```

Get the name of the chip this request was made on.

Returns

Name to the GPIO chip.

6.10.3.2 fd()

```
int gpiod::line_request::fd ( ) const
```

Get the file descriptor number associated with this line request.

Returns

File descriptor number.

6.10.3.3 get_value()

```
line::value gpiod::line_request::get_value (
            line::offset offset )
```

Get the value of a single requested line.

Parameters

offset	Offset of the line to read within the chip.

Returns

Current line value.

6.10.3.4 get_values() [1/4]

```
line::values gpiod::line_request::get_values ( )
```

Get the values of all requested lines.

Returns

List of read values.

6.10.3.5 get_values() [2/4]

```
line::values gpiod::line_request::get_values (
            const line::offsets & offsets )
```

Get the values of a subset of requested lines.

Parameters

offsets	Vector of line offsets

Returns

Vector of lines values with indexes of values corresponding to those of the offsets.

6.10.3.6 get_values() [3/4]

```
void gpiod::line_request::get_values (
            const line::offsets & offsets,
            line::values & values )
```

Get the values of a subset of requested lines into a vector supplied by the caller.

Parameters

offsets	Vector of line offsets.
values	Vector for storing the values. Its size must be at least that of the offsets vector. The indexes of read values will correspond with those in the offsets vector.

6.10.3.7 get_values() [4/4]

```
void gpiod::line_request::get_values (
            line::values & values )
```

Get the values of all requested lines.

Parameters

values	Array in which the values will be stored. Must hold at least the number of elements returned by line_request::num_lines.

6.10.3.8 num_lines()

```
::std::size_t gpiod::line_request::num_lines ( ) const
```

Get the number of requested lines.

Returns

Number of lines in this request.

6.10.3.9 offsets()

```
line::offsets gpiod::line_request::offsets ( ) const
```

Get the list of offsets of requested lines.

Returns

List of hardware offsets of the lines in this request.

6.10.3.10 operator bool()

```
gpiod::line_request::operator bool ( ) const  [explicit], [noexcept]
```

Check if this object is valid.

Returns

True if this object's methods can be used, false otherwise. False usually means the request was released. If the user calls any of the methods of this class on an object for which this operator returned false, a logic_error will be thrown.

6.10.3.11 operator=()

```
line_request & gpiod::line_request::operator= (
            line_request && other )  [noexcept]
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

6.10.3.12 read_edge_events() [1/2]

```
::std::size_t gpiod::line_request::read_edge_events (
            edge_event_buffer & buffer )
```

Read a number of edge events from this request up to the maximum capacity of the buffer.

Parameters

buffer	Edge event buffer to read events into.

Returns

Number of events read.

6.10.3.13 read_edge_events() [2/2]

```
::std::size_t gpiod::line_request::read_edge_events (
            edge_event_buffer & buffer,
            ::std::size_t max_events )
```

Read a number of edge events from this request.

Parameters

buffer	Edge event buffer to read events into.
max_events	Maximum number of events to read. Limited by the capacity of the buffer.

Returns

Number of events read.

6.10.3.14 reconfigure_lines()

```
line_request & gpiod::line_request::reconfigure_lines (
            const line_config & config )
```

Apply new config options to requested lines.

Parameters

config	New configuration.

Returns

Reference to self.

6.10.3.15 release()

```
void gpiod::line_request::release ( )
```

Release the requested lines and free all associated resources.

Note

The object can still be used after this method is called but using any of the mutators will result in throwing a logic_error exception.

6.10.3.16 set_value()

```
line_request & gpiod::line_request::set_value (
            line::offset offset,
            line::value value )
```

Set the value of a single requested line.

Parameters

offset	Offset of the line to set within the chip.
value	New line value.

Returns

Reference to self.

6.10.3.17 set_values() [1/3]

```
line_request & gpiod::line_request::set_values (
            const line::offsets & offsets,
            const line::values & values )
```

Set the values of a subset of requested lines.

Parameters

offsets	Vector containing the offsets of lines to set.
values	Vector containing new values with indexes corresponding with those in the offsets vector.

Returns

Reference to self.

6.10.3.18 set_values() [2/3]

```
line_request & gpiod::line_request::set_values (
            const line::value_mappings & values )
```

Set the values of a subset of requested lines.

Parameters

values	Vector containing a set of offset->value mappings.

Returns

Reference to self.

6.10.3.19 set_values() [3/3]

```
line_request & gpiod::line_request::set_values (
            const line::values & values )
```

Set the values of all requested lines.

Parameters

values	Array of new line values. The size must be equal to the value returned by line_request::num_lines.

Returns

Reference to self.

6.10.3.20 wait_edge_events()

```
bool gpiod::line_request::wait_edge_events (
            const ::std::chrono::nanoseconds & timeout ) const
```

Wait for edge events on any of the lines requested with edge detection enabled.

Parameters

timeout	Wait time limit in nanoseconds. If set to 0, the function returns immediately. If set to a negative number, the function blocks indefinitely until an event becomes available.

Returns

True if at least one event is ready to be read. False if the wait timed out.

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

- gpiodcxx/line-request.hpp

6.11 gpiod::line_settings Class Reference

Stores GPIO line settings.

`#include <line-settings.hpp>`

Public Member Functions

- **line_settings** ()
  Initializes the line_settings object with default values.
- line_settings (const line_settings &other)
  Copy constructor.
- line_settings (line_settings &&other) noexcept
  Move constructor.
- line_settings & operator= (const line_settings &other)
  Copy assignment operator.
- line_settings & operator= (line_settings &&other)
  Move assignment operator.
- line_settings & reset () noexcept
  Reset the line settings to default values.
- line_settings & set_direction (line::direction direction)
  Set direction.
- line::direction direction () const
  Get direction.
- line_settings & set_edge_detection (line::edge edge)
  Set edge detection.
- line::edge edge_detection () const
  Get edge detection.
- line_settings & set_bias (line::bias bias)
  Set bias setting.
- line::bias bias () const
  Get bias setting.
- line_settings & set_drive (line::drive drive)
  Set drive setting.
- line::drive drive () const
  Get drive setting.
- line_settings & set_active_low (bool active_low)
  Set the active-low setting.
- bool active_low () const noexcept
  Get the active-low setting.
- line_settings & set_debounce_period (const ::std::chrono::microseconds &period)

Set debounce period.

- ::std::chrono::microseconds debounce_period () const noexcept

  Get debounce period.

- line_settings & set_event_clock (line::clock event_clock)

  Set the event clock to use for edge event timestamps.

- line::clock event_clock () const

  Get the event clock used for edge event timestamps.

- line_settings & set_output_value (line::value value)

  Set the output value.

- line::value output_value () const

  Get the output value.

Private Attributes

- ::std::unique_ptr< impl > **_m_priv**
- friend **line_config**

6.11.1 Detailed Description

Stores GPIO line settings.

6.11.2 Constructor & Destructor Documentation

6.11.2.1 line_settings() [1/2]

```
gpiod::line_settings::line_settings (
            const line_settings & other )
```

Copy constructor.

Parameters

other	Object to copy.

6.11.2.2 line_settings() [2/2]

```
gpiod::line_settings::line_settings (
            line_settings && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.11.3 Member Function Documentation

6.11.3.1 active_low()

```
bool gpiod::line_settings::active_low ( ) const  [noexcept]
```

Get the active-low setting.

Returns

Current active-low setting.

6.11.3.2 bias()

```
line::bias gpiod::line_settings::bias ( ) const
```

Get bias setting.

Returns

Current bias.

6.11.3.3 debounce_period()

```
::std::chrono::microseconds gpiod::line_settings::debounce_period ( ) const  [noexcept]
```

Get debounce period.

Returns

Current debounce period.

6.11.3.4 direction()

```
line::direction gpiod::line_settings::direction ( ) const
```

Get direction.

Returns

Current direction setting.

6.11.3.5 drive()

```
line::drive gpiod::line_settings::drive ( ) const
```

Get drive setting.

Returns

Current drive.

6.11.3.6 edge_detection()

```
line::edge gpiod::line_settings::edge_detection ( ) const
```

Get edge detection.

Returns

Current edge detection setting.

6.11.3.7 event_clock()

```
line::clock gpiod::line_settings::event_clock ( ) const
```

Get the event clock used for edge event timestamps.

Returns

Current event clock type.

6.11.3.8 operator=() [1/2]

```
line_settings & gpiod::line_settings::operator= (
            const line_settings & other )
```

Copy assignment operator.

Parameters

other	Object to copy.

Returns

Reference to self.

6.11.3.9 operator=() [2/2]

```
line_settings & gpiod::line_settings::operator= (
            line_settings && other )
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

6.11.3.10 output_value()

```
line::value gpiod::line_settings::output_value ( ) const
```

Get the output value.

Returns

Current output value.

6.11.3.11 reset()

```
line_settings & gpiod::line_settings::reset ( )  [noexcept]
```

Reset the line settings to default values.

Returns

Reference to self.

6.11.3.12 set_active_low()

```
line_settings & gpiod::line_settings::set_active_low (
            bool active_low )
```

Set the active-low setting.

Parameters

active_low	New active-low setting.

Returns

Reference to self.

6.11.3.13 set_bias()

```
line_settings & gpiod::line_settings::set_bias (
            line::bias bias )
```

Set bias setting.

Parameters

bias	New bias.

Returns

Reference to self.

6.11.3.14 set_debounce_period()

```
line_settings & gpiod::line_settings::set_debounce_period (
            const ::std::chrono::microseconds & period )
```

Set debounce period.

Parameters

period	New debounce period in microseconds.

Returns

Reference to self.

6.11.3.15 set_direction()

```
line_settings & gpiod::line_settings::set_direction (
            line::direction direction )
```

Set direction.

Parameters

direction	New direction.

Returns

Reference to self.

6.11.3.16 set_drive()

```
line_settings & gpiod::line_settings::set_drive (
            line::drive drive )
```

Set drive setting.

Parameters

drive	New drive.

Returns

Reference to self.

6.11.3.17 set_edge_detection()

```
line_settings & gpiod::line_settings::set_edge_detection (
            line::edge edge )
```

Set edge detection.

Parameters

edge	New edge detection setting.

Returns

Reference to self.

6.11.3.18 set_event_clock()

```
line_settings & gpiod::line_settings::set_event_clock (
            line::clock event_clock )
```

Set the event clock to use for edge event timestamps.

Parameters

event_clock	Clock to use.

Returns

Reference to self.

6.11.3.19 set_output_value()

```
line_settings & gpiod::line_settings::set_output_value (
            line::value value )
```

Set the output value.

Parameters

value	New output value.

Returns

Reference to self.

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

- gpiodcxx/line-settings.hpp

6.12 gpiod::line::offset Class Reference

Wrapper around unsigned int for representing line offsets.

`#include <line.hpp>`

Public Member Functions

- offset (unsigned int off=0)
  Constructor with implicit conversion from unsigned int.
- offset (const offset &other)=default
  Copy constructor.
- offset (offset &&other)=default
  Move constructor.
- offset & operator= (const offset &other)=default
  Assignment operator.
- offset & operator= (offset &&other) noexcept=default
  Move assignment operator.
- **operator unsigned int** () const noexcept
  Conversion operator to `unsigned int`.

Private Attributes

- unsigned int **_m_offset**

6.12.1 Detailed Description

Wrapper around unsigned int for representing line offsets.

6.12.2 Constructor & Destructor Documentation

6.12.2.1 offset() [1/3]

```
gpiod::line::offset::offset (
            unsigned int off = 0 )  [inline]
```

Constructor with implicit conversion from unsigned int.

Parameters

off	Line offset.

6.12.2.2 offset() [2/3]

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

Copy constructor.

Parameters

other	Object to copy.

6.12.2.3 offset() [3/3]

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

Move constructor.

Parameters

other	Object to move.

6.12.3 Member Function Documentation

6.12.3.1 operator=() [1/2]

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

Assignment operator.

Parameters

other	Object to copy.

Returns

Reference to self.

6.12.3.2 operator=() [2/2]

```
offset & gpiod::line::offset::operator= (
```

```
offset && other )  [default], [noexcept]
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

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

- gpiodcxx/line.hpp

6.13 gpiod::request_builder Class Reference

Intermediate object storing the configuration for a line request.

`#include <request-builder.hpp>`

Public Member Functions

- **request_builder** (const request_builder &other)=delete
- request_builder (request_builder &&other) noexcept
  Move constructor.
- request_builder & **operator=** (const request_builder &other)=delete
- request_builder & operator= (request_builder &&other) noexcept
  Move assignment operator.
- request_builder & set_request_config (request_config &req_cfg)
  Set the request config for the request.
- const request_config & get_request_config () const noexcept
  Get the current request config.
- request_builder & set_consumer (const ::std::string &consumer) noexcept
  Set consumer in the request config stored by this object.
- request_builder & set_event_buffer_size (::std::size_t event_buffer_size) noexcept
  Set the event buffer size in the request config stored by this object.
- request_builder & set_line_config (line_config &line_cfg)
  Set the line config for this request.
- const line_config & get_line_config () const noexcept
  Get the current line config.
- request_builder & add_line_settings (line::offset offset, const line_settings &settings)
  Add line settings to the line config stored by this object for a single offset.
- request_builder & add_line_settings (const line::offsets &offsets, const line_settings &settings)
  Add line settings to the line config stored by this object for a set of offsets.
- request_builder & set_output_values (const line::values &values)
  Set output values for a number of lines in the line config stored by this object.
- line_request do_request ()
  Make the line request.

Private Member Functions

- **request_builder** (chip &chip)
- friend::std::ostream & **operator**<< (::std::ostream &out, const request_builder &builder)

Private Attributes

- ::std::unique_ptr< impl > **_m_priv**
- friend **chip**

6.13.1 Detailed Description

Intermediate object storing the configuration for a line request.

6.13.2 Constructor & Destructor Documentation

6.13.2.1 request_builder()

```
gpiod::request_builder::request_builder (
            request_builder && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to be moved.

6.13.3 Member Function Documentation

6.13.3.1 add_line_settings() [1/2]

```
request_builder & gpiod::request_builder::add_line_settings (
            const line::offsets & offsets,
            const line_settings & settings )
```

Add line settings to the line config stored by this object for a set of offsets.

Parameters

offsets	Offsets for which to add settings.
settings	Settings to add.

Returns

Reference to self.

6.13.3.2 add_line_settings() [2/2]

```
request_builder & gpiod::request_builder::add_line_settings (
            line::offset offset,
            const line_settings & settings )
```

Add line settings to the line config stored by this object for a single offset.

Parameters

offset	Offset for which to add settings.
settings	Line settings to use.

Returns

Reference to self.

6.13.3.3 do_request()

```
line_request gpiod::request_builder::do_request ( )
```

Make the line request.

Returns

New line_request object.

6.13.3.4 get_line_config()

```
const line_config & gpiod::request_builder::get_line_config ( ) const  [noexcept]
```

Get the current line config.

Returns

Const reference to the current line config stored by this object.

6.13.3.5 get_request_config()

```
const request_config & gpiod::request_builder::get_request_config ( ) const  [noexcept]
```

Get the current request config.

Returns

Const reference to the current request config stored by this object.

6.13.3.6 operator=()

```
request_builder & gpiod::request_builder::operator= (
            request_builder && other )  [noexcept]
```

Move assignment operator.

Parameters

other	Object to be moved.

Returns

Reference to self.

6.13.3.7 set_consumer()

```
request_builder & gpiod::request_builder::set_consumer (
            const ::std::string & consumer )  [noexcept]
```

Set consumer in the request config stored by this object.

Parameters

consumer	New consumer string.

Returns

Reference to self.

6.13.3.8 set_event_buffer_size()

```
request_builder & gpiod::request_builder::set_event_buffer_size (
            ::std::size_t event_buffer_size )  [noexcept]
```

Set the event buffer size in the request config stored by this object.

Parameters

event_buffer_size	New event buffer size.

Returns

Reference to self.

6.13.3.9 set_line_config()

```
request_builder & gpiod::request_builder::set_line_config (
            line_config & line_cfg )
```

Set the line config for this request.

Parameters

line_cfg	Line config to use.

Returns

Reference to self.

6.13.3.10 set_output_values()

```
request_builder & gpiod::request_builder::set_output_values (
            const line::values & values )
```

Set output values for a number of lines in the line config stored by this object.

Parameters

values	Buffer containing the output values.

Returns

Reference to self.

6.13.3.11 set_request_config()

```
request_builder & gpiod::request_builder::set_request_config (
            request_config & req_cfg )
```

Set the request config for the request.

Parameters

req_cfg	Request config to use.

Returns

Reference to self.

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

- gpiodcxx/request-builder.hpp

6.14 gpiod::request_config Class Reference

Stores a set of options passed to the kernel when making a line request.

`#include <request-config.hpp>`

Public Member Functions

- **request_config** ()

  Constructor.
- **request_config** (const request_config &other)=delete
- request_config (request_config &&other) noexcept

  Move constructor.
- request_config & operator= (request_config &&other) noexcept

  Move assignment operator.
- request_config & set_consumer (const ::std::string &consumer) noexcept

  Set the consumer name.
- ::std::string consumer () const noexcept

  Get the consumer name.
- request_config & set_event_buffer_size (::std::size_t event_buffer_size) noexcept

  Set the size of the kernel event buffer.
- ::std::size_t event_buffer_size () const noexcept

  Get the edge event buffer size from this request config.

Private Member Functions

- request_config & **operator=** (const request_config &other)

Private Attributes

- ::std::shared_ptr< impl > **_m_priv**
- friend **request_builder**

6.14.1 Detailed Description

Stores a set of options passed to the kernel when making a line request.

6.14.2 Constructor & Destructor Documentation

6.14.2.1 request_config()

```
gpiod::request_config::request_config (
            request_config && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.14.3 Member Function Documentation

6.14.3.1 consumer()

```
::std::string gpiod::request_config::consumer ( ) const  [noexcept]
```

Get the consumer name.

Returns

Currently configured consumer name. May be an empty string.

6.14.3.2 event_buffer_size()

```
::std::size_t gpiod::request_config::event_buffer_size ( ) const  [noexcept]
```

Get the edge event buffer size from this request config.

Returns

Current edge event buffer size setting.

6.14.3.3 operator=()

```
request_config & gpiod::request_config::operator= (
            request_config && other )  [noexcept]
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

6.14.3.4 set_consumer()

```
request_config & gpiod::request_config::set_consumer (
            const ::std::string & consumer )  [noexcept]
```

Set the consumer name.

Parameters

consumer	New consumer name.

Returns

Reference to self.

6.14.3.5 set_event_buffer_size()

```
request_config & gpiod::request_config::set_event_buffer_size (
            ::std::size_t event_buffer_size )  [noexcept]
```

Set the size of the kernel event buffer.

Parameters

event_buffer_size	New event buffer size.

Returns

Reference to self.

Note

The kernel may adjust the value if it's too high. If set to 0, the default value will be used.

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

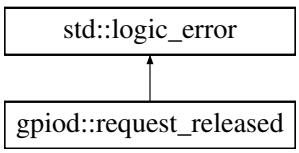
- gpiodcxx/request-config.hpp

6.15 gpiod::request_released Class Reference

Exception thrown when an already released line request is used.

`#include <exception.hpp>`

Inheritance diagram for gpiod::request_released:



Public Member Functions

- request_released (const ::std::string &what)
  Constructor.
- request_released (const request_released &other) noexcept
  Copy constructor.
- request_released (request_released &&other) noexcept
  Move constructor.
- request_released & operator= (const request_released &other) noexcept
  Assignment operator.
- request_released & operator= (request_released &&other) noexcept
  Move assignment operator.

6.15.1 Detailed Description

Exception thrown when an already released line request is used.

6.15.2 Constructor & Destructor Documentation

6.15.2.1 request_released() [1/3]

```
gpiod::request_released::request_released (
            const ::std::string & what )  [explicit]
```

Constructor.

Parameters

what	Human readable reason for error.

6.15.2.2 request_released() [2/3]

```
gpiod::request_released::request_released (
            const request_released & other )  [noexcept]
```

Copy constructor.

Parameters

other	Object to copy from.

6.15.2.3 request_released() [3/3]

```
gpiod::request_released::request_released (
            request_released && other )  [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.15.3 Member Function Documentation

6.15.3.1 operator=() [1/2]

```
request_released & gpiod::request_released::operator= (
            const request_released & other )  [noexcept]
```

Assignment operator.

Parameters

other	Object to copy from.

Returns

Reference to self.

6.15.3.2 operator=() [2/2]

```
request_released & gpiod::request_released::operator= (
            request_released && other )  [noexcept]
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

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

- gpiodcxx/exception.hpp

6.16 gpiod::timestamp Class Reference

Stores the edge and info event timestamps as returned by the kernel and allows to convert them to std::chrono↩ ::time_point.

```
#include <timestamp.hpp>
```

Public Types

- using **time_point_monotonic** = ::std::chrono::time_point<::std::chrono::steady_clock >

  Monotonic time_point.
- using **time_point_realtime** = ::std::chrono::time_point<::std::chrono::system_clock, ::std::chrono↩ ::nanoseconds >

  Real-time time_point.

Public Member Functions

- timestamp (::std::uint64_t ns)

  Constructor with implicit conversion from `uint64_t`.
- timestamp (const timestamp &other) noexcept=default

  Copy constructor.
- timestamp (timestamp &&other) noexcept=default

  Move constructor.
- timestamp & operator= (const timestamp &other) noexcept=default

  Assignment operator.
- timestamp & operator= (timestamp &&other) noexcept=default

  Move assignment operator.
- **operator::std::uint64_t** () noexcept

  Conversion operator to `std::uint64_t`.
- ::std::uint64_t ns () const noexcept

  Get the timestamp in nanoseconds.
- time_point_monotonic to_time_point_monotonic () const

  Convert the timestamp to a monotonic time_point.
- time_point_realtime to_time_point_realtime () const

  Convert the timestamp to a real-time time_point.

Private Attributes

- ::std::uint64_t **_m_ns**

6.16.1 Detailed Description

Stores the edge and info event timestamps as returned by the kernel and allows to convert them to std::chrono↩ ::time_point.

6.16.2 Constructor & Destructor Documentation

6.16.2.1 timestamp() [1/3]

```
gpiod::timestamp::timestamp (
            ::std::uint64_t ns )  [inline]
```

Constructor with implicit conversion from `uint64_t`.

Parameters

ns	Timestamp in nanoseconds.

6.16.2.2 timestamp() [2/3]

```
gpiod::timestamp::timestamp (
            const timestamp & other )  [default], [noexcept]
```

Copy constructor.

Parameters

other	Object to copy.

6.16.2.3 timestamp() [3/3]

```
gpiod::timestamp::timestamp (
            timestamp && other )  [default], [noexcept]
```

Move constructor.

Parameters

other	Object to move.

6.16.3 Member Function Documentation

6.16.3.1 ns()

```
::std::uint64_t gpiod::timestamp::ns ( ) const  [inline], [noexcept]
```

Get the timestamp in nanoseconds.

Returns

Timestamp in nanoseconds.

6.16.3.2 operator=() [1/2]

```
timestamp & gpiod::timestamp::operator= (
            const timestamp & other )  [default], [noexcept]
```

Assignment operator.

Parameters

other	Object to copy.

Returns

Reference to self.

6.16.3.3 operator=() [2/2]

```
timestamp & gpiod::timestamp::operator= (
            timestamp && other )  [default], [noexcept]
```

Move assignment operator.

Parameters

other	Object to move.

Returns

Reference to self.

6.16.3.4 to_time_point_monotonic()

```
time_point_monotonic gpiod::timestamp::to_time_point_monotonic ( ) const  [inline]
```

Convert the timestamp to a monotonic time_point.

Returns

time_point associated with the steady clock.

6.16.3.5 to_time_point_realtime()

```
time_point_realtime gpiod::timestamp::to_time_point_realtime ( ) const  [inline]
```

Convert the timestamp to a real-time time_point.

Returns

time_point associated with the system clock.

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

- gpiodcxx/timestamp.hpp

Chapter 7

File Documentation

7.1 gpiod.hpp File Reference

```
#include "gpiodcxx/chip.hpp"
#include "gpiodcxx/chip-info.hpp"
#include "gpiodcxx/edge-event.hpp"
#include "gpiodcxx/edge-event-buffer.hpp"
#include "gpiodcxx/exception.hpp"
#include "gpiodcxx/info-event.hpp"
#include "gpiodcxx/line.hpp"
#include "gpiodcxx/line-config.hpp"
#include "gpiodcxx/line-info.hpp"
#include "gpiodcxx/line-request.hpp"
#include "gpiodcxx/line-settings.hpp"
#include "gpiodcxx/request-builder.hpp"
#include "gpiodcxx/request-config.hpp"
```

7.2 gpiod.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2021-2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_GPIOD_CXX_HPP__
00009 #define __LIBGPIOD_GPIOD_CXX_HPP__
00010
00015 /*
00016  * We don't make this symbol private because it needs to be accessible by
00017  * the declarations in exception.hpp in order to expose the symbols of classes
00018  * inheriting from standard exceptions.
00019  */
00020 #define GPIOD_CXX_API __attribute__((visibility("default")))
00021
00026 #define __LIBGPIOD_GPIOD_CXX_INSIDE__
00027 #include "gpiodcxx/chip.hpp"
00028 #include "gpiodcxx/chip-info.hpp"
00029 #include "gpiodcxx/edge-event.hpp"
00030 #include "gpiodcxx/edge-event-buffer.hpp"
00031 #include "gpiodcxx/exception.hpp"
00032 #include "gpiodcxx/info-event.hpp"
00033 #include "gpiodcxx/line.hpp"
00034 #include "gpiodcxx/line-config.hpp"
00035 #include "gpiodcxx/line-info.hpp"
00036 #include "gpiodcxx/line-request.hpp"
00037 #include "gpiodcxx/line-settings.hpp"
00038 #include "gpiodcxx/request-builder.hpp"
00039 #include "gpiodcxx/request-config.hpp"
00040 #undef __LIBGPIOD_GPIOD_CXX_INSIDE__
00041
00042 #endif /* __LIBGPIOD_GPIOD_CXX_HPP__ */
```

7.3 gpiodcxx/chip-info.hpp File Reference

```
#include <memory>
#include <ostream>
```

Classes

- class gpiod::chip_info

  Represents an immutable snapshot of GPIO chip information.

Functions

- ::std::ostream & gpiod::operator<< (::std::ostream &out, const chip_info &chip)

  Stream insertion operator for GPIO chip objects.

7.3.1 Function Documentation

7.3.1.1 operator<<()

```
::std::ostream & gpiod::operator<< (
            ::std::ostream & out,
            const chip_info & chip )
```

Stream insertion operator for GPIO chip objects.

Parameters

out	Output stream to write to.
chip	GPIO chip to insert into the output stream.

Returns

Reference to out.

7.4 chip-info.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_CHIP_INFO_HPP__
00009 #define __LIBGPIOD_CXX_CHIP_INFO_HPP__
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <memory>
00016 #include <ostream>
00017
00018 namespace gpiod {
```

```
00019
00020 class chip;
00021
00025 class chip_info final
00026 {
00027 public:
00028
00033     chip_info(const chip_info& other);
00034
00039     chip_info(chip_info&& other) noexcept;
00040
00041     ~chip_info();
00042
00048     chip_info& operator=(const chip_info& other);
00049
00055     chip_info& operator=(chip_info&& other) noexcept;
00056
00061     ::std::string name() const noexcept;
00062
00067     ::std::string label() const noexcept;
00068
00073     ::std::size_t num_lines() const noexcept;
00074
00075 private:
00076
00077     chip_info();
00078
00079     struct impl;
00080
00081     ::std::shared_ptr<impl> _m_priv;
00082
00083     friend chip;
00084 };
00085
00092 ::std::ostream& operator<<(::std::ostream& out, const chip_info& chip);
00093
00094 } /* namespace gpiod */
00095
00096 #endif /* __LIBGPIOD_CXX_CHIP_INFO_HPP__ */
```

7.5 gpiodcxx/chip.hpp File Reference

```
#include <chrono>
#include <cstddef>
#include <iostream>
#include <filesystem>
#include <memory>
#include "line.hpp"
```

Classes

- class gpiod::chip

  Represents a GPIO chip.

Functions

- ::std::ostream & gpiod::operator<< (::std::ostream &out, const chip &chip)

  Stream insertion operator for GPIO chip objects.

7.5.1 Function Documentation

7.5.1.1 operator<<()

```
::std::ostream & gpiod::operator<< (
            ::std::ostream & out,
            const chip & chip )
```

Stream insertion operator for GPIO chip objects.

Parameters

out	Output stream to write to.
chip	GPIO chip to insert into the output stream.

Returns

Reference to out.

7.6 chip.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2021-2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_CHIP_HPP__
00009 #define __LIBGPIOD_CXX_CHIP_HPP__
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <chrono>
00016 #include <cstddef>
00017 #include <iostream>
00018 #include <filesystem>
00019 #include <memory>
00020
00021 #include "line.hpp"
00022
00023 namespace gpiod {
00024
00025 class chip_info;
00026 class info_event;
00027 class line_config;
00028 class line_info;
00029 class line_request;
00030 class request_builder;
00031 class request_config;
00032
00036 class chip final
00037 {
00038 public:
00039
00045     explicit chip(const ::std::filesystem::path& path);
00046
00051     chip(chip&& other) noexcept;
00052
00053     ~chip();
00054
00055     chip& operator=(const chip& other) = delete;
00056
00062     chip& operator=(chip&& other) noexcept;
00063
00071     explicit operator bool() const noexcept;
00072
00078     void close();
00079
00084     ::std::filesystem::path path() const;
00085
00090     chip_info get_info() const;
00091
00098     line_info get_line_info(line::offset offset) const;
00099
00106     line_info watch_line_info(line::offset offset) const;
00107
00112     void unwatch_line_info(line::offset offset) const;
00113
00118     int fd() const;
00119
00130     bool wait_info_event(const ::std::chrono::nanoseconds& timeout) const;
00131
00136     info_event read_info_event() const;
00137
00144     int get_line_offset_from_name(const ::std::string& name) const;
00145
```

```
00150     request_builder prepare_request();
00151
00152 private:
00153
00154     struct impl;
00155
00156     ::std::shared_ptr<impl> _m_priv;
00157
00158     chip(const chip& other);
00159
00160     friend request_builder;
00161 };
00162
00169 ::std::ostream& operator<<(::std::ostream& out, const chip& chip);
00170
00171 } /* namespace gpiod */
00172
00173 #endif /* __LIBGPIOD_CXX_CHIP_HPP__ */
```

7.7 gpiodcxx/edge-event-buffer.hpp File Reference

```
#include <cstddef>
#include <iostream>
#include <memory>
#include <vector>
```

Classes

- class gpiod::edge_event_buffer

  Object into which edge events are read for better performance.

Functions

- ::std::ostream & gpiod::operator<< (::std::ostream &out, const edge_event_buffer &buf)

  Stream insertion operator for GPIO edge event buffer objects.

7.7.1 Function Documentation

7.7.1.1 operator<<()

```
::std::ostream & gpiod::operator<< (
            ::std::ostream & out,
            const edge_event_buffer & buf )
```

Stream insertion operator for GPIO edge event buffer objects.

Parameters

out	Output stream to write to.
buf	GPIO edge event buffer object to insert into the output stream.

Returns

Reference to out.

7.8 edge-event-buffer.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2021-2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_EDGE_EVENT_BUFFER_HPP__
00009 #define __LIBGPIOD_CXX_EDGE_EVENT_BUFFER_HPP__
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <cstddef>
00016 #include <iostream>
00017 #include <memory>
00018 #include <vector>
00019
00020 namespace gpiod {
00021
00022 class edge_event;
00023 class line_request;
00024
00032 class edge_event_buffer final
00033 {
00034 public:
00035
00040     using const_iterator = ::std::vector<edge_event>::const_iterator;
00041
00047     explicit edge_event_buffer(::std::size_t capacity = 64);
00048
00049     edge_event_buffer(const edge_event_buffer& other) = delete;
00050
00055     edge_event_buffer(edge_event_buffer&& other) noexcept;
00056
00057     ~edge_event_buffer();
00058
00059     edge_event_buffer& operator=(const edge_event_buffer& other) = delete;
00060
00066     edge_event_buffer& operator=(edge_event_buffer&& other) noexcept;
00067
00073     const edge_event& get_event(unsigned int index) const;
00074
00079     ::std::size_t num_events() const;
00080
00085     ::std::size_t capacity() const noexcept;
00086
00092     const_iterator begin() const noexcept;
00093
00099     const_iterator end() const noexcept;
00100
00101 private:
00102
00103     struct impl;
00104
00105     ::std::unique_ptr<impl> _m_priv;
00106
00107     friend line_request;
00108 };
00109
00116 ::std::ostream& operator<<(::std::ostream& out, const edge_event_buffer& buf);
00117
00118 } /* namespace gpiod */
00119
00120 #endif /* __LIBGPIOD_CXX_EDGE_EVENT_BUFFER_HPP__ */
```

7.9 gpiodcxx/edge-event.hpp File Reference

```
#include <cstdint>
#include <iostream>
#include <memory>
#include "timestamp.hpp"
```

Classes

- class gpiod::edge_event

  Immutable object containing data about a single edge event.

Functions

- ::std::ostream & gpiod::operator<< (::std::ostream &out, const edge_event &event)

  Stream insertion operator for edge events.

7.9.1 Function Documentation

7.9.1.1 operator<<()

```
::std::ostream & gpiod::operator<< (
            ::std::ostream & out,
            const edge_event & event )
```

Stream insertion operator for edge events.

Parameters

out	Output stream to write to.
event	Edge event to insert into the output stream.

Returns

Reference to out.

7.10 edge-event.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2021-2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_EDGE_EVENT_HPP__
00009 #define __LIBGPIOD_CXX_EDGE_EVENT_HPP__
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <cstdint>
00016 #include <iostream>
00017 #include <memory>
00018
00019 #include "timestamp.hpp"
00020
00021 namespace gpiod {
00022
00023 class edge_event_buffer;
00024
00028 class edge_event final
00029 {
00030 public:
00031
00035     enum class event_type
00036     {
```

```
00037         RISING_EDGE = 1,
00039         FALLING_EDGE,
00041     };
00042
00047     edge_event(const edge_event& other);
00048
00053     edge_event(edge_event&& other) noexcept;
00054
00055     ~edge_event();
00056
00062     edge_event& operator=(const edge_event& other);
00063
00069     edge_event& operator=(edge_event&& other) noexcept;
00070
00075     event_type type() const;
00076
00082     timestamp timestamp_ns() const noexcept;
00083
00089     line::offset line_offset() const noexcept;
00090
00096     unsigned long global_seqno() const noexcept;
00097
00103     unsigned long line_seqno() const noexcept;
00104
00105 private:
00106
00107     edge_event();
00108
00109     struct impl;
00110     struct impl_managed;
00111     struct impl_external;
00112
00113     ::std::shared_ptr<impl> _m_priv;
00114
00115     friend edge_event_buffer;
00116 };
00117
00124 ::std::ostream& operator<<(::std::ostream& out, const edge_event& event);
00125
00126 } /* namespace gpiod */
00127
00128 #endif /* __LIBGPIOD_CXX_EDGE_EVENT_HPP__ */
```

7.11 gpiodcxx/exception.hpp File Reference

```
#include <stdexcept>
#include <string>
```

Classes

- class gpiod::chip_closed

  Exception thrown when an already closed chip is used.
- class gpiod::request_released

  Exception thrown when an already released line request is used.
- class gpiod::bad_mapping

  Exception thrown when the core C library returns an invalid value for any of the line_info properties.

7.12 exception.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2021-2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_EXCEPTION_HPP__
00009 #define __LIBGPIOD_CXX_EXCEPTION_HPP__
00010
```

```
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <stdexcept>
00016 #include <string>
00017
00018 namespace gpiod {
00019
00023 class GPIOD_CXX_API chip_closed final : public ::std::logic_error
00024 {
00025 public:
00026
00031     explicit chip_closed(const ::std::string& what);
00032
00037     chip_closed(const chip_closed& other) noexcept;
00038
00043     chip_closed(chip_closed&& other) noexcept;
00044
00050     chip_closed& operator=(const chip_closed& other) noexcept;
00051
00057     chip_closed& operator=(chip_closed&& other) noexcept;
00058
00059     ~chip_closed();
00060 };
00061
00065 class GPIOD_CXX_API request_released final : public ::std::logic_error
00066 {
00067 public:
00068
00073     explicit request_released(const ::std::string& what);
00074
00079     request_released(const request_released& other) noexcept;
00080
00085     request_released(request_released&& other) noexcept;
00086
00092     request_released& operator=(const request_released& other) noexcept;
00093
00099     request_released& operator=(request_released&& other) noexcept;
00100
00101     ~request_released();
00102 };
00103
00108 class GPIOD_CXX_API bad_mapping final : public ::std::runtime_error
00109 {
00110 public:
00111
00116     explicit bad_mapping(const ::std::string& what);
00117
00122     bad_mapping(const bad_mapping& other) noexcept;
00123
00128     bad_mapping(bad_mapping&& other) noexcept;
00129
00135     bad_mapping& operator=(const bad_mapping& other) noexcept;
00136
00142     bad_mapping& operator=(bad_mapping&& other) noexcept;
00143
00144     ~bad_mapping();
00145 };
00146
00147 } /* namespace gpiod */
00148
00149 #endif /* __LIBGPIOD_CXX_EXCEPTION_HPP__ */
```

7.13 info-event.hpp

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2021-2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_INFO_EVENT_HPP__
00009 #define __LIBGPIOD_CXX_INFO_EVENT_HPP__
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <cstdint>
00016 #include <iostream>
00017 #include <memory>
00018
00019 #include "timestamp.hpp"
00020
00021 namespace gpiod {
```

```
00022
00023 class chip;
00024 class line_info;
00025
00029 class info_event final
00030 {
00031 public:
00032
00036     enum class event_type
00037     {
00038         LINE_REQUESTED = 1,
00040         LINE_RELEASED,
00042         LINE_CONFIG_CHANGED,
00044     };
00045
00050     info_event(const info_event& other);
00051
00056     info_event(info_event&& other) noexcept;
00057
00058     ~info_event();
00059
00065     info_event& operator=(const info_event& other);
00066
00072     info_event& operator=(info_event&& other) noexcept;
00073
00078     event_type type() const;
00079
00084     ::std::uint64_t timestamp_ns() const noexcept;
00085
00091     const line_info& get_line_info() const noexcept;
00092
00093 private:
00094
00095     info_event();
00096
00097     struct impl;
00098
00099     ::std::shared_ptr<impl> _m_priv;
00100
00101     friend chip;
00102 };
00103
00110 ::std::ostream& operator<<(::std::ostream& out, const info_event& event);
00111
00112 } /* namespace gpiod */
00113
00114 #endif /* __LIBGPIOD_CXX_INFO_EVENT_HPP__ */
```

7.14 gpiodcxx/line-config.hpp File Reference

```
#include <map>
#include <memory>
```

Classes

- class gpiod::line_config

  Contains a set of line config options used in line requests and reconfiguration.

Functions

- ::std::ostream & gpiod::operator<< (::std::ostream &out, const line_config &config)

  Stream insertion operator for GPIO line config objects.

7.14.1 Function Documentation

7.14.1.1 operator<<()

```
::std::ostream & gpiod::operator<< (
            ::std::ostream & out,
            const line_config & config )
```

Stream insertion operator for GPIO line config objects.

Parameters

out	Output stream to write to.
config	Line config object to insert into the output stream.

Returns

Reference to out.

7.15 line-config.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2021-2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_LINE_CONFIG_HPP__
00009 #define __LIBGPIOD_CXX_LINE_CONFIG_HPP__
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <map>
00016 #include <memory>
00017
00018 namespace gpiod {
00019
00020 class chip;
00021 class line_request;
00022 class line_settings;
00023
00028 class line_config final
00029 {
00030 public:
00031
00032
00033     line_config();
00034
00035     line_config(const line_config& other) = delete;
00036
00041     line_config(line_config&& other) noexcept;
00042
00043     ~line_config();
00044
00050     line_config& operator=(line_config&& other) noexcept;
00051
00056     line_config& reset() noexcept;
00057
00064     line_config& add_line_settings(line::offset offset, const line_settings& settings);
00065
00072     line_config& add_line_settings(const line::offsets& offsets, const line_settings& settings);
00073
00079     line_config& set_output_values(const line::values& values);
00080
00087     ::std::map<line::offset, line_settings> get_line_settings() const;
00088
00089 private:
00090
```

```
00091     struct impl;
00092
00093     ::std::shared_ptr<impl> _m_priv;
00094
00095     line_config& operator=(const line_config& other);
00096
00097     friend line_request;
00098     friend request_builder;
00099 };
00100
00107 ::std::ostream& operator<<(::std::ostream& out, const line_config& config);
00108
00109 } /* namespace gpiod */
00110
00111 #endif /* __LIBGPIOD_CXX_LINE_CONFIG_HPP__ */
```

7.16 gpiodcxx/line-info.hpp File Reference

```
#include <chrono>
#include <iostream>
#include <memory>
#include <string>
```

Classes

- class gpiod::line_info

  Contains an immutable snapshot of the line's state at the time when the object of this class was instantiated.

Functions

- ::std::ostream & gpiod::operator<< (::std::ostream &out, const line_info &info)

  Stream insertion operator for GPIO line info objects.

7.16.1 Function Documentation

7.16.1.1 operator<<()

```
::std::ostream & gpiod::operator<< (
            ::std::ostream & out,
            const line_info & info )
```

Stream insertion operator for GPIO line info objects.

Parameters

out	Output stream to write to.
info	GPIO line info object to insert into the output stream.

Returns

Reference to out.

7.17 line-info.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2021-2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_LINE_INFO_HPP__
00009 #define __LIBGPIOD_CXX_LINE_INFO_HPP__
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <chrono>
00016 #include <iostream>
00017 #include <memory>
00018 #include <string>
00019
00020 namespace gpiod {
00021
00022 class chip;
00023 class info_event;
00024
00029 class line_info final
00030 {
00031 public:
00032
00037     line_info(const line_info& other) noexcept;
00038
00043     line_info(line_info&& other) noexcept;
00044
00045     ~line_info();
00046
00052     line_info& operator=(const line_info& other) noexcept;
00053
00059     line_info& operator=(line_info&& other) noexcept;
00060
00065     line::offset offset() const noexcept;
00066
00072     ::std::string name() const noexcept;
00073
00082     bool used() const noexcept;
00083
00090     ::std::string consumer() const noexcept;
00091
00096     line::direction direction() const;
00097
00102     line::edge edge_detection() const;
00103
00109     line::bias bias() const;
00110
00116     line::drive drive() const;
00117
00122     bool active_low() const noexcept;
00123
00129     bool debounced() const noexcept;
00130
00136     ::std::chrono::microseconds debounce_period() const noexcept;
00137
00143     line::clock event_clock() const;
00144
00145 private:
00146
00147     line_info();
00148
00149     struct impl;
00150
00151     ::std::shared_ptr<impl> _m_priv;
00152
00153     friend chip;
00154     friend info_event;
00155 };
00156
00163 ::std::ostream& operator<<(::std::ostream& out, const line_info& info);
00164
00165 } /* namespace gpiod */
00166
00167 #endif /* __LIBGPIOD_CXX_LINE_INFO_HPP__ */
```

7.18 gpiodcxx/line-request.hpp File Reference

```
#include <chrono>
#include <cstddef>
#include <iostream>
#include <memory>
```

Classes

- class gpiod::line_request

  Stores the context of a set of requested GPIO lines.

Functions

- ::std::ostream & gpiod::operator<< (::std::ostream &out, const line_request &request)

  Stream insertion operator for line requests.

7.18.1 Function Documentation

7.18.1.1 operator<<()

```
::std::ostream & gpiod::operator<< (
            ::std::ostream & out,
            const line_request & request )
```

Stream insertion operator for line requests.

Parameters

out	Output stream to write to.
request	Line request object to insert into the output stream.

Returns

Reference to out.

7.19 line-request.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2021-2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_LINE_REQUEST_HPP__
00009 #define __LIBGPIOD_CXX_LINE_REQUEST_HPP__
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <chrono>
```

```
00016 #include <cstddef>
00017 #include <iostream>
00018 #include <memory>
00019
00020 namespace gpiod {
00021
00022 class chip;
00023 class edge_event;
00024 class edge_event_buffer;
00025 class line_config;
00026
00030 class line_request final
00031 {
00032 public:
00033
00034     line_request(const line_request& other) = delete;
00035
00040     line_request(line_request&& other) noexcept;
00041
00042     ~line_request();
00043
00044     line_request& operator=(const line_request& other) = delete;
00045
00051     line_request& operator=(line_request&& other) noexcept;
00052
00061     explicit operator bool() const noexcept;
00062
00069     void release();
00070
00075     ::std::string chip_name() const;
00076
00081     ::std::size_t num_lines() const;
00082
00087     line::offsets offsets() const;
00088
00094     line::value get_value(line::offset offset);
00095
00102     line::values get_values(const line::offsets& offsets);
00103
00108     line::values get_values();
00109
00119     void get_values(const line::offsets& offsets, line::values& values);
00120
00127     void get_values(line::values& values);
00128
00135     line_request& set_value(line::offset offset, line::value value);
00136
00142     line_request& set_values(const line::value_mappings& values);
00143
00151     line_request& set_values(const line::offsets& offsets, const line::values& values);
00152
00159     line_request& set_values(const line::values& values);
00160
00166     line_request& reconfigure_lines(const line_config& config);
00167
00173     int fd() const;
00174
00185     bool wait_edge_events(const ::std::chrono::nanoseconds& timeout) const;
00186
00193     ::std::size_t read_edge_events(edge_event_buffer& buffer);
00194
00202     ::std::size_t read_edge_events(edge_event_buffer& buffer, ::std::size_t max_events);
00203
00204 private:
00205
00206     line_request();
00207
00208     struct impl;
00209
00210     ::std::unique_ptr<impl> _m_priv;
00211
00212     friend request_builder;
00213 };
00214
00221 ::std::ostream& operator<<(::std::ostream& out, const line_request& request);
00222
00223 } /* namespace gpiod */
00224
00225 #endif /* __LIBGPIOD_CXX_LINE_REQUEST_HPP__ */
```

7.20 line-settings.hpp

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
```

```
00002 /* SPDX-FileCopyrightText: 2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_LINE_SETTINGS_HPP__
00009 #define __LIBGPIOD_CXX_LINE_SETTINGS_HPP__
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <chrono>
00016 #include <memory>
00017
00018 #include "line.hpp"
00019
00020 namespace gpiod {
00021
00022 class line_config;
00023
00027 class line_settings final
00028 {
00029 public:
00030
00034     line_settings();
00035
00040     line_settings(const line_settings& other);
00041
00046     line_settings(line_settings&& other) noexcept;
00047
00048     ~line_settings();
00049
00055     line_settings& operator=(const line_settings& other);
00056
00062     line_settings& operator=(line_settings&& other);
00063
00068     line_settings& reset() noexcept;
00069
00075     line_settings& set_direction(line::direction direction);
00076
00081     line::direction direction() const;
00082
00088     line_settings& set_edge_detection(line::edge edge);
00089
00094     line::edge edge_detection() const;
00095
00101     line_settings& set_bias(line::bias bias);
00102
00107     line::bias bias() const;
00108
00114     line_settings& set_drive(line::drive drive);
00115
00120     line::drive drive() const;
00121
00127     line_settings& set_active_low(bool active_low);
00128
00133     bool active_low() const noexcept;
00134
00140     line_settings& set_debounce_period(const ::std::chrono::microseconds& period);
00141
00146     ::std::chrono::microseconds debounce_period() const noexcept;
00147
00153     line_settings& set_event_clock(line::clock event_clock);
00154
00159     line::clock event_clock() const;
00160
00166     line_settings& set_output_value(line::value value);
00167
00172     line::value output_value() const;
00173
00174 private:
00175
00176     struct impl;
00177
00178     ::std::unique_ptr<impl> _m_priv;
00179
00180     friend line_config;
00181 };
00182
00189 ::std::ostream& operator<<(::std::ostream& out, const line_settings& settings);
00190
00191 } /* namespace gpiod */
00192
00193 #endif /* __LIBGPIOD_CXX_LINE_SETTINGS_HPP__ */
```

7.21 gpiodcxx/line.hpp File Reference

```
#include <ostream>
#include <utility>
#include <vector>
```

Classes

- class gpiod::line::offset

  Wrapper around unsigned int for representing line offsets.

Namespaces

- namespace gpiod::line

  Namespace containing various type definitions for GPIO lines.

Typedefs

- using **gpiod::line::offsets** = ::std::vector< offset >

  Vector of line offsets.
- using **gpiod::line::values** = ::std::vector< value >

  Vector of line values.
- using **gpiod::line::value_mapping** = ::std::pair< offset, value >

  Represents a mapping of a line offset to line logical state.
- using **gpiod::line::value_mappings** = ::std::vector< value_mapping >

  Vector of offset->value mappings. Each mapping is defined as a pair of an unsigned and signed integers.

Enumerations

- enum class gpiod::line::value { gpiod::line::INACTIVE = 0 , gpiod::line::ACTIVE = 1 }

  Logical line states.
- enum class gpiod::line::direction { gpiod::line::AS_IS = 1 , gpiod::line::INPUT , gpiod::line::OUTPUT }

  Direction settings.
- enum class gpiod::line::edge { gpiod::line::NONE = 1 , gpiod::line::RISING , gpiod::line::FALLING , gpiod::line::BOTH }

  Edge detection settings.
- enum class gpiod::line::bias { gpiod::line::AS_IS = 1 , gpiod::line::UNKNOWN , gpiod::line::DISABLED , gpiod::line::PULL_UP , gpiod::line::PULL_DOWN }

  Internal bias settings.
- enum class gpiod::line::drive { gpiod::line::PUSH_PULL = 1 , gpiod::line::OPEN_DRAIN , gpiod::line::OPEN_SOURCE }

  Drive settings.
- enum class gpiod::line::clock { gpiod::line::MONOTONIC = 1 , gpiod::line::REALTIME , **HTE** }

  Event clock settings.

Functions

- ::std::ostream & gpiod::line::operator<< (::std::ostream &out, value val)

  Stream insertion operator for logical line values.
- ::std::ostream & gpiod::line::operator<< (::std::ostream &out, direction dir)

  Stream insertion operator for direction values.
- ::std::ostream & gpiod::line::operator<< (::std::ostream &out, edge edge)

  Stream insertion operator for edge detection values.
- ::std::ostream & gpiod::line::operator<< (::std::ostream &out, bias bias)

  Stream insertion operator for bias values.
- ::std::ostream & gpiod::line::operator<< (::std::ostream &out, drive drive)

  Stream insertion operator for drive values.
- ::std::ostream & gpiod::line::operator<< (::std::ostream &out, clock clock)

  Stream insertion operator for event clock values.
- ::std::ostream & gpiod::line::operator<< (::std::ostream &out, const values &vals)

  Stream insertion operator for the list of output values.
- ::std::ostream & gpiod::line::operator<< (::std::ostream &out, const offsets &offs)

  Stream insertion operator for the list of line offsets.
- ::std::ostream & gpiod::line::operator<< (::std::ostream &out, const value_mapping &mapping)

  Stream insertion operator for the offset-to-value mapping.
- ::std::ostream & gpiod::line::operator<< (::std::ostream &out, const value_mappings &mappings)

  Stream insertion operator for the list of offset-to-value mappings.

7.22 line.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2021-2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_LINE_HPP__
00009 #define __LIBGPIOD_CXX_LINE_HPP__
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <ostream>
00016 #include <utility>
00017 #include <vector>
00018
00019 namespace gpiod {
00020
00024 namespace line {
00025
00029 class offset
00030 {
00031 public:
00036     offset(unsigned int off = 0) : _m_offset(off) {   }
00037
00042     offset(const offset& other) = default;
00043
00048     offset(offset&& other) = default;
00049
00050     ~offset() = default;
00051
00057     offset& operator=(const offset& other) = default;
00058
00064     offset& operator=(offset&& other) noexcept = default;
00065
00069     operator unsigned int() const noexcept
00070     {
00071         return this->_m_offset;
00072     }
00073
00074 private:
00075     unsigned int _m_offset;
```

```
00076 };
00077
00081 enum class value
00082 {
00083     INACTIVE = 0,
00085     ACTIVE = 1,
00087 };
00088
00092 enum class direction
00093 {
00094     AS_IS = 1,
00096     INPUT,
00098     OUTPUT,
00100 };
00101
00105 enum class edge
00106 {
00107     NONE = 1,
00109     RISING,
00111     FALLING,
00113     BOTH,
00115 };
00116
00120 enum class bias
00121 {
00122     AS_IS = 1,
00124     UNKNOWN,
00126     DISABLED,
00128     PULL_UP,
00130     PULL_DOWN,
00132 };
00133
00137 enum class drive
00138 {
00139     PUSH_PULL = 1,
00141     OPEN_DRAIN,
00143     OPEN_SOURCE,
00145 };
00146
00150 enum class clock
00151 {
00152     MONOTONIC = 1,
00154     REALTIME,
00156     HTE,
00157     /*« Line uses the hardware timestamp engine for event timestamps. */
00158 };
00159
00163 using offsets = ::std::vector<offset>;
00164
00168 using values = ::std::vector<value>;
00169
00173 using value_mapping = ::std::pair<offset, value>;
00174
00179 using value_mappings = ::std::vector<value_mapping>;
00180
00187 ::std::ostream& operator«(::std::ostream& out, value val);
00188
00195 ::std::ostream& operator«(::std::ostream& out, direction dir);
00196
00203 ::std::ostream& operator«(::std::ostream& out, edge edge);
00204
00211 ::std::ostream& operator«(::std::ostream& out, bias bias);
00212
00219 ::std::ostream& operator«(::std::ostream& out, drive drive);
00220
00227 ::std::ostream& operator«(::std::ostream& out, clock clock);
00228
00235 ::std::ostream& operator«(::std::ostream& out, const values& vals);
00236
00243 ::std::ostream& operator«(::std::ostream& out, const offsets& offs);
00244
00252 ::std::ostream& operator«(::std::ostream& out, const value_mapping& mapping);
00253
00261 ::std::ostream& operator«(::std::ostream& out, const value_mappings& mappings);
00262
00263 } /* namespace line */
00264
00265 } /* namespace gpiod */
00266
00267 #endif /* __LIBGPIOD_CXX_LINE_HPP__ */
```

7.23 gpiodcxx/misc.hpp File Reference

```
#include <string>
```

Functions

- bool gpiod::is_gpiochip_device (const ::std::filesystem::path &path)

  Check if the file pointed to by path is a GPIO chip character device.
- const ::std::string & gpiod::api_version ()

  Get the human readable version string for libgpiod API.

7.23.1 Function Documentation

7.23.1.1 api_version()

```
const ::std::string & gpiod::api_version ( )
```

Get the human readable version string for libgpiod API.

Returns

String containing the library version.

7.23.1.2 is_gpiochip_device()

```
bool gpiod::is_gpiochip_device (
            const ::std::filesystem::path & 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.

7.24 misc.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2021 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_MISC_HPP__
00009 #define __LIBGPIOD_CXX_MISC_HPP__
```

```
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <string>
00016
00017 namespace gpiod {
00018
00025 bool is_gpiochip_device(const ::std::filesystem::path& path);
00026
00031 const ::std::string& api_version();
00032
00033 } /* namespace gpiod */
00034
00035 #endif /* __LIBGPIOD_CXX_MISC_HPP__ */
```

7.25 gpiodcxx/request-builder.hpp File Reference

```
#include <memory>
#include <ostream>
```

Classes

- class gpiod::request_builder

  Intermediate object storing the configuration for a line request.

Functions

- ::std::ostream & gpiod::operator<< (::std::ostream &out, const request_builder &builder)

  Stream insertion operator for GPIO request builder objects.

7.25.1 Function Documentation

7.25.1.1 operator<<()

```
::std::ostream & gpiod::operator<< (
            ::std::ostream & out,
            const request_builder & builder )
```

Stream insertion operator for GPIO request builder objects.

Parameters

out	Output stream to write to.
builder	Request builder object to insert into the output stream.

Returns

Reference to out.

7.26 request-builder.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_REQUEST_BUILDER_HPP__
00009 #define __LIBGPIOD_CXX_REQUEST_BUILDER_HPP__
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <memory>
00016 #include <ostream>
00017
00018 namespace gpiod {
00019
00020 class chip;
00021 class line_config;
00022 class line_request;
00023 class request_config;
00024
00028 class request_builder final
00029 {
00030 public:
00031
00032     request_builder(const request_builder& other) = delete;
00033
00038     request_builder(request_builder&& other) noexcept;
00039
00040     ~request_builder();
00041
00042     request_builder& operator=(const request_builder& other) = delete;
00043
00049     request_builder& operator=(request_builder&& other) noexcept;
00050
00056     request_builder& set_request_config(request_config& req_cfg);
00057
00063     const request_config& get_request_config() const noexcept;
00064
00070     request_builder& set_consumer(const ::std::string& consumer) noexcept;
00071
00078     request_builder& set_event_buffer_size(::std::size_t event_buffer_size) noexcept;
00079
00085     request_builder& set_line_config(line_config &line_cfg);
00086
00092     const line_config& get_line_config() const noexcept;
00093
00101     request_builder& add_line_settings(line::offset offset, const line_settings& settings);
00102
00110     request_builder& add_line_settings(const line::offsets& offsets, const line_settings& settings);
00111
00118     request_builder& set_output_values(const line::values& values);
00119
00124     line_request do_request();
00125
00126 private:
00127
00128     struct impl;
00129
00130     request_builder(chip& chip);
00131
00132     ::std::unique_ptr<impl> _m_priv;
00133
00134     friend chip;
00135     friend ::std::ostream& operator<<(::std::ostream& out, const request_builder& builder);
00136 };
00137
00144 ::std::ostream& operator<<(::std::ostream& out, const request_builder& builder);
00145
00146 } /* namespace gpiod */
00147
00148 #endif /* __LIBGPIOD_CXX_REQUEST_BUILDER_HPP__ */
```

7.27 gpiodcxx/request-config.hpp File Reference

```
#include <cstddef>
#include <iostream>
```

```
#include <memory>
#include <string>
#include "line.hpp"
```

Classes

- class gpiod::request_config

  Stores a set of options passed to the kernel when making a line request.

Functions

- ::std::ostream & gpiod::operator<< (::std::ostream &out, const request_config &config)

  Stream insertion operator for request_config objects.

7.27.1 Function Documentation

7.27.1.1 operator<<()

```
::std::ostream & gpiod::operator<< (
            ::std::ostream & out,
            const request_config & config )
```

Stream insertion operator for request_config objects.

Parameters

out	Output stream to write to.
config	request_config to insert into the output stream.

Returns

Reference to out.

7.28 request-config.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2021-2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_REQUEST_CONFIG_HPP__
00009 #define __LIBGPIOD_CXX_REQUEST_CONFIG_HPP__
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <cstddef>
00016 #include <iostream>
00017 #include <memory>
00018 #include <string>
00019
00020 #include "line.hpp"
00021
```

```
00022 namespace gpiod {
00023
00024 class chip;
00025
00030 class request_config final
00031 {
00032 public:
00033
00037     request_config();
00038
00039     request_config(const request_config& other) = delete;
00040
00045     request_config(request_config&& other) noexcept;
00046
00047     ~request_config();
00048
00054     request_config& operator=(request_config&& other) noexcept;
00055
00061     request_config& set_consumer(const ::std::string& consumer) noexcept;
00062
00067     ::std::string consumer() const noexcept;
00068
00076     request_config& set_event_buffer_size(::std::size_t event_buffer_size) noexcept;
00077
00082     ::std::size_t event_buffer_size() const noexcept;
00083
00084 private:
00085
00086     struct impl;
00087
00088     ::std::shared_ptr<impl> _m_priv;
00089
00090     request_config& operator=(const request_config& other);
00091
00092     friend request_builder;
00093 };
00094
00101 ::std::ostream& operator<<(::std::ostream& out, const request_config& config);
00102
00103 } /* namespace gpiod */
00104
00105 #endif /* __LIBGPIOD_CXX_REQUEST_CONFIG_HPP__ */
```

7.29 gpiodcxx/timestamp.hpp File Reference

```
#include <chrono>
#include <cstdint>
```

Classes

- class gpiod::timestamp

  Stores the edge and info event timestamps as returned by the kernel and allows to convert them to std::chrono::time_point.

7.30 timestamp.hpp

Go to the documentation of this file.

```
00001 /* SPDX-License-Identifier: LGPL-2.1-or-later */
00002 /* SPDX-FileCopyrightText: 2022 Bartosz Golaszewski <brgl@bgdev.pl> */
00003
00008 #ifndef __LIBGPIOD_CXX_TIMESTAMP_HPP__
00009 #define __LIBGPIOD_CXX_TIMESTAMP_HPP__
00010
00011 #if !defined(__LIBGPIOD_GPIOD_CXX_INSIDE__)
00012 #error "Only gpiod.hpp can be included directly."
00013 #endif
00014
00015 #include <chrono>
```

```
00016 #include <cstdint>
00017
00018 namespace gpiod {
00019
00024 class timestamp final
00025 {
00026 public:
00027
00031     using time_point_monotonic = ::std::chrono::time_point<::std::chrono::steady_clock>;
00032
00036     using time_point_realtime = ::std::chrono::time_point<::std::chrono::system_clock,
00037                                 ::std::chrono::nanoseconds>;
00038
00043     timestamp(::std::uint64_t ns) : _m_ns(ns) { }
00044
00049     timestamp(const timestamp& other) noexcept = default;
00050
00055     timestamp(timestamp&& other) noexcept = default;
00056
00062     timestamp& operator=(const timestamp& other) noexcept = default;
00063
00069     timestamp& operator=(timestamp&& other) noexcept = default;
00070
00071     ~timestamp() = default;
00072
00076     operator ::std::uint64_t() noexcept
00077     {
00078         return this->ns();
00079     }
00080
00085     ::std::uint64_t ns() const noexcept
00086     {
00087         return this->_m_ns;
00088     }
00089
00094     time_point_monotonic to_time_point_monotonic() const
00095     {
00096         return time_point_monotonic(::std::chrono::nanoseconds(this->ns()));
00097     }
00098
00103     time_point_realtime to_time_point_realtime() const
00104     {
00105         return time_point_realtime(::std::chrono::nanoseconds(this->ns()));
00106     }
00107
00108 private:
00109     ::std::uint64_t _m_ns;
00110 };
00111
00112 } /* namespace gpiod */
00113
00114 #endif /* __LIBGPIOD_CXX_TIMESTAMP_HPP__ */
```

Index