V4L2 read()

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Unknown directive type "c:namespace".

```
.. c:namespace:: V4L
```

Name

v4l2-read - Read from a V4L2 device

Synopsis

```
#include <unistd.h>
```

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```
.. c:function:: ssize_t read( int fd, void *buf, size_t count )
```

Arguments

`fd`

File descriptor returned by :c:func:`open()`.

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`buf`

Buffer to be filled

`count`

Max number of bytes to read

Description

:c:func:`read()` attempts to read up to `count` bytes from file descriptor `fd` into the buffer starting at `buf`. The layout of the data in the buffer is discussed in the respective device interface section, see ##. If `count` is zero, :c:func:`read()` returns zero and has no other results. If `count` is greater than `SSIZE_MAX`, the result is unspecified. Regardless of the `count` value each :c:func:`read()` call will provide at most one frame (two fields) worth of data.

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By default :c:func:`read()` blocks until data becomes available. When the `O_NONBLOCK` flag was given to the :c:func:`open()` function it returns immediately with an `EAGAIN` error code when no data is available. The :c:func:`select()` or :c:func:`poll()` functions can always be used to suspend execution until data becomes available. All drivers supporting the :c:func:`read()` function must also support :c:func:`select()` and :c:func:`poll()`.

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Drivers can implement read functionality in different ways, using a single or multiple buffers and discarding the oldest or newest frames once the internal buffers are filled.

:c:func:`read()` never returns a "snapshot" of a buffer being filled. Using a single buffer the driver will stop capturing when the application starts reading the buffer until the read is finished. Thus only the period of the vertical blanking interval is available for reading, or the capture rate must fall below the nominal frame rate of the video standard.

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The behavior of :c:func:`read()` when called during the active picture period or the vertical blanking separating the top and bottom field depends on the discarding policy. A driver discarding the oldest frames keeps capturing into an internal buffer, continuously overwriting the previously, not read frame, and returns the frame being received at the time of the :c:func:`read()` call as soon as it is complete.

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A driver discarding the newest frames stops capturing until the next :c:func:`read()` call. The frame being received at :c:func:`read()` time is discarded, returning the following frame instead. Again this implies a reduction of the capture rate to one half or less of the nominal frame rate. An example of this model is the video read mode of the bttv driver, initiating a DMA to user memory when :c:func:`read()` is called and returning when the DMA finished.

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In the multiple buffer model drivers maintain a ring of internal buffers, automatically advancing to the next free buffer. This allows continuous capturing when the application can empty the buffers fast enough. Again, the behavior when the driver runs out of free buffers depends on the discarding policy.

Applications can get and set the number of buffers used internally by the driver with the :ref:`VIDIOC_G_PARM <VIDIOC_G_PARM>` and :ref:`VIDIOC_S_PARM <VIDIOC_G_PARM>` ioctls. They are optional, however. The discarding policy is not reported and cannot be changed. For minimum requirements see :ref:`devices`.

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Return Value

On success, the number of bytes read is returned. It is not an error if this number is smaller than the number of bytes requested, or the amount of data required for one frame. This may happen for example because :c:func:`read()` was interrupted by a signal. On error, -1 is returned, and the `errno` variable is set appropriately. In this case the next read will start at the beginning of a new frame. Possible error codes are:

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EAGAIN

Non-blocking I/O has been selected using O_NONBLOCK and no data was immediately available for reading.

EBADF

`fd` is not a valid file descriptor or is not open for reading, or the process already has the maximum number of files open.

EBUSY

The driver does not support multiple read streams and the device is already in use.

EFAULT

`buf` references an inaccessible memory area.

EINTR

The call was interrupted by a signal before any data was read.

EIO

I/O error. This indicates some hardware problem or a failure to communicate with a remote device (USB camera etc.).

EINVAL

The :c:func:`read()` function is not supported by this driver, not on this device, or generally not on this type of device.

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