ioctl VIDIOC_ENUM_FMT

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Unknown directive type "c:namespace".

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

Name

VIDIOC_ENUM_FMT - Enumerate image formats

Synopsis

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Unknown directive type "c:macro".

```
.. c:macro:: VIDIOC_ENUM_FMT
```

```
int ioctl(int fd, VIDIOC_ENUM_FMT, struct v4l2_fmtdesc *argp)
```

Arguments

`fd`

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

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Unknown interpreted text role "c:func".

`argp`

Pointer to struct :c:type:`v4l2_fmtdesc`.

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Unknown interpreted text role "c:type".

Description

To enumerate image formats applications initialize the `type`, `mbus_code` and `index` fields of struct :c:type:`v4l2_fmtdesc` and call the :ref:`VIDIOC_ENUM_FMT` ioctl with a pointer to this structure. Drivers fill the rest of the structure or return an `EINVAL` error code. All formats are enumerable by beginning at index zero and incrementing by one until `EINVAL` is returned. If applicable, drivers shall return formats in preference order, where preferred formats are returned before (that is, with lower `index` value) less-preferred formats.

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Unknown interpreted text role "c:type".

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Unknown interpreted text role "ref".

Depending on the V4L2_CAP_IO_MC :ref:`capability <device-capabilities>`, the mbus_code field is handled differently:

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Unknown interpreted text role "ref".

1. V4L2_CAP_IO_MC is not set (also known as a 'video-node-centric' driver)

   Applications shall initialize the mbus_code field to zero and drivers shall ignore the value of the field.

   Drivers shall enumerate all image formats.

   Note

   After switching the input or output the list of enumerated image formats may be different.

2. V4L2_CAP_IO_MC is set (also known as an 'MC-centric' driver)

   If the mbus_code field is zero, then all image formats shall be enumerated.

   If the mbus_code field is initialized to a valid (non-zero) :ref:`media bus format code <v4l2-mbus-pixelcode>`, then drivers shall restrict enumeration to only the image formats that can produce (for video output devices) or be produced from (for video capture devices) that media bus code. If the mbus_code is unsupported by the driver, then EINVAL shall be returned.

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   Unknown interpreted text role "ref".

   Regardless of the value of the mbus_code field, the enumerated image formats shall not depend on the active configuration of the video device or device pipeline.

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Unknown directive type "c:type".

```
.. c:type:: v4l2_fmtdesc
```

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Unknown directive type "cssclass".

```
.. cssclass:: longtable
```

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Unknown directive type "tabularcolumns".

```
.. tabularcolumns:: |p{4.4cm}|p{4.4cm}|p{8.5cm}|
```

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Unknown directive type "flat-table".

```
.. flat-table:: struct v4l2_fmtdesc
    :header-rows:  0
    :stub-columns: 0
    :widths:       1 1 2

    * - __u32
      - ``index``
      - Number of the format in the enumeration, set by the application.
        This is in no way related to the ``pixelformat`` field.
    * - __u32
      - ``type``
      - Type of the data stream, set by the application. Only these types
        are valid here: ``V4L2_BUF_TYPE_VIDEO_CAPTURE``,
        ``V4L2_BUF_TYPE_VIDEO_CAPTURE_MPLANE``,
        ``V4L2_BUF_TYPE_VIDEO_OUTPUT``,
        ``V4L2_BUF_TYPE_VIDEO_OUTPUT_MPLANE``,
        ``V4L2_BUF_TYPE_VIDEO_OVERLAY``,
        ``V4L2_BUF_TYPE_SDR_CAPTURE``,
        ``V4L2_BUF_TYPE_SDR_OUTPUT``,
        ``V4L2_BUF_TYPE_META_CAPTURE`` and
        ``V4L2_BUF_TYPE_META_OUTPUT``.
        See :c:type:`v4l2_buf_type`.
    * - __u32
      - ``flags``
      - See :ref:`fmtdesc-flags`
    * - __u8
      - ``description``\ [32]
      - Description of the format, a NUL-terminated ASCII string. This
        information is intended for the user, for example: "YUV 4:2:2".
    * - __u32
      - ``pixelformat``
      - The image format identifier. This is a four character code as
        computed by the v4l2_fourcc() macro:
    * - :cspan:`2`

        .. _v4l2-fourcc:

        ``#define v4l2_fourcc(a,b,c,d)``

        ``(((__u32)(a)<<0)|((__u32)(b)<<8)|((__u32)(c)<<16)|((__u32)(d)<<24))``

        Several image formats are already defined by this specification in
        :ref:`pixfmt`.

        .. attention::

           These codes are not the same as those used
           in the Windows world.
    * - __u32
      - ``mbus_code``
      - Media bus code restricting the enumerated formats, set by the
        application. Only applicable to drivers that advertise the
        ``V4L2_CAP_IO_MC`` :ref:`capability <device-capabilities>`, shall be 0
        otherwise.
    * - __u32
      - ``reserved``\ [3]
      - Reserved for future extensions. Drivers must set the array to
        zero.
```

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Unknown directive type "tabularcolumns".

```
.. tabularcolumns:: |p{8.4cm}|p{1.8cm}|p{7.1cm}|
```

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Unknown directive type "cssclass".

```
.. cssclass:: longtable
```

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Unknown directive type "flat-table".

```
.. flat-table:: Image Format Description Flags
    :header-rows:  0
    :stub-columns: 0
    :widths:       3 1 4

    * - ``V4L2_FMT_FLAG_COMPRESSED``
      - 0x0001
      - This is a compressed format.
    * - ``V4L2_FMT_FLAG_EMULATED``
      - 0x0002
      - This format is not native to the device but emulated through
        software (usually libv4l2), where possible try to use a native
        format instead for better performance.
    * - ``V4L2_FMT_FLAG_CONTINUOUS_BYTESTREAM``
      - 0x0004
      - The hardware decoder for this compressed bytestream format (aka coded
        format) is capable of parsing a continuous bytestream. Applications do
        not need to parse the bytestream themselves to find the boundaries
        between frames/fields.

        This flag can only be used in combination with the
        ``V4L2_FMT_FLAG_COMPRESSED`` flag, since this applies to compressed
        formats only. This flag is valid for stateful decoders only.
    * - ``V4L2_FMT_FLAG_DYN_RESOLUTION``
      - 0x0008
      - Dynamic resolution switching is supported by the device for this
        compressed bytestream format (aka coded format). It will notify the user
        via the event ``V4L2_EVENT_SOURCE_CHANGE`` when changes in the video
        parameters are detected.

        This flag can only be used in combination with the
        ``V4L2_FMT_FLAG_COMPRESSED`` flag, since this applies to
        compressed formats only. This flag is valid for stateful codecs only.
    * - ``V4L2_FMT_FLAG_ENC_CAP_FRAME_INTERVAL``
      - 0x0010
      - The hardware encoder supports setting the ``CAPTURE`` coded frame
        interval separately from the ``OUTPUT`` raw frame interval.
        Setting the ``OUTPUT`` raw frame interval with :ref:`VIDIOC_S_PARM <VIDIOC_G_PARM>`
        also sets the ``CAPTURE`` coded frame interval to the same value.
        If this flag is set, then the ``CAPTURE`` coded frame interval can be
        set to a different value afterwards. This is typically used for
        offline encoding where the ``OUTPUT`` raw frame interval is used as
        a hint for reserving hardware encoder resources and the ``CAPTURE`` coded
        frame interval is the actual frame rate embedded in the encoded video
        stream.

        This flag can only be used in combination with the
        ``V4L2_FMT_FLAG_COMPRESSED`` flag, since this applies to
        compressed formats only. This flag is valid for stateful encoders only.
    * - ``V4L2_FMT_FLAG_CSC_COLORSPACE``
      - 0x0020
      - The driver allows the application to try to change the default
        colorspace. This flag is relevant only for capture devices.
        The application can ask to configure the colorspace of the capture device
        when calling the :ref:`VIDIOC_S_FMT <VIDIOC_G_FMT>` ioctl with
        :ref:`V4L2_PIX_FMT_FLAG_SET_CSC <v4l2-pix-fmt-flag-set-csc>` set.
    * - ``V4L2_FMT_FLAG_CSC_XFER_FUNC``
      - 0x0040
      - The driver allows the application to try to change the default
        transfer function. This flag is relevant only for capture devices.
        The application can ask to configure the transfer function of the capture
        device when calling the :ref:`VIDIOC_S_FMT <VIDIOC_G_FMT>` ioctl with
        :ref:`V4L2_PIX_FMT_FLAG_SET_CSC <v4l2-pix-fmt-flag-set-csc>` set.
    * - ``V4L2_FMT_FLAG_CSC_YCBCR_ENC``
      - 0x0080
      - The driver allows the application to try to change the default
        Y'CbCr encoding. This flag is relevant only for capture devices.
        The application can ask to configure the Y'CbCr encoding of the capture device
        when calling the :ref:`VIDIOC_S_FMT <VIDIOC_G_FMT>` ioctl with
        :ref:`V4L2_PIX_FMT_FLAG_SET_CSC <v4l2-pix-fmt-flag-set-csc>` set.
    * - ``V4L2_FMT_FLAG_CSC_HSV_ENC``
      - 0x0080
```

```
      - The driver allows the application to try to change the default
        HSV encoding. This flag is relevant only for capture devices.
        The application can ask to configure the HSV encoding of the capture device
        when calling the :ref:`VIDIOC_S_FMT <VIDIOC_G_FMT>` ioctl with
        :ref:`V4L2_PIX_FMT_FLAG_SET_CSC <v4l2-pix-fmt-flag-set-csc>` set.
    * - ``V4L2_FMT_FLAG_CSC_QUANTIZATION``
      - 0x0100
      - The driver allows the application to try to change the default
        quantization. This flag is relevant only for capture devices.
        The application can ask to configure the quantization of the capture
        device when calling the :ref:`VIDIOC_S_FMT <VIDIOC_G_FMT>` ioctl with
        :ref:`V4L2_PIX_FMT_FLAG_SET_CSC <v4l2-pix-fmt-flag-set-csc>` set.
```

Return Value

On success 0 is returned, on error -1 and the `errno` variable is set appropriately. The generic error codes are described at the :ref:`Generic Error Codes <gen-errors>` chapter.

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Unknown interpreted text role "ref".

EINVAL

The struct :c:type:`v4l2_fmtdesc` `type` is not supported or the `index` is out of bounds.

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Unknown interpreted text role "c:type".

If `V4L2_CAP_IO_MC` is set and the specified `mbus_code` is unsupported, then also return this error code.