

# Touch Devices

Touch devices are accessed through character device special files named `/dev/v4l-touch0` to `/dev/v4l-touch255` with major number 81 and dynamically allocated minor numbers 0 to 255.

## Overview

Sensors may be Optical, or Projected Capacitive touch (PCT).

Processing is required to analyse the raw data and produce input events. In some systems, this may be performed on the ASIC and the raw data is purely a side-channel for diagnostics or tuning. In other systems, the ASIC is a simple analogue front end device which delivers touch data at high rate, and any touch processing must be done on the host.

For capacitive touch sensing, the touchscreen is composed of an array of horizontal and vertical conductors (alternatively called rows/columns, X/Y lines, or tx/rx). Mutual Capacitance measured is at the nodes where the conductors cross. Alternatively, Self Capacitance measures the signal from each column and row independently.

A touch input may be determined by comparing the raw capacitance measurement to a no-touch reference (or "baseline") measurement:

$\Delta = \text{Raw} - \text{Reference}$

The reference measurement takes account of variations in the capacitance across the touch sensor matrix, for example manufacturing irregularities, environmental or edge effects.

## Querying Capabilities

Devices supporting the touch interface set the `V4L2_CAP_VIDEO_CAPTURE` flag and the `V4L2_CAP_TOUCH` flag in the `capabilities` field of `:c:type:'v4l2_capability'` returned by the `ref:'VIDIOC_QUERYCAP'` ioctl.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\userspace-api\media\v4l\[linux-master] [Documentation] [userspace-api] [media] [v4l]dev-touch.rst, line 42); [backlink](#)

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At least one of the read/write or streaming I/O methods must be supported.

The formats supported by touch devices are documented in `ref:'Touch Formats <tch-formats>'`.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\userspace-api\media\v4l\[linux-master] [Documentation] [userspace-api] [media] [v4l]dev-touch.rst, line 50); [backlink](#)

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## Data Format Negotiation

A touch device may support any I/O method.