

Optical Requirements on External Window

Most applications will require an outer cover window, for design cosmetics and protection against dust and humidity.

The optical properties on cover windows placed in front of the sensor are essential in order to maintain a high touch performance. If light is lost, scattered or diverted it will lead to shorter detection range and lower touch accuracy.

Optical Requirements

Window material must be optically clear, without absorption and have optical quality surfaces.

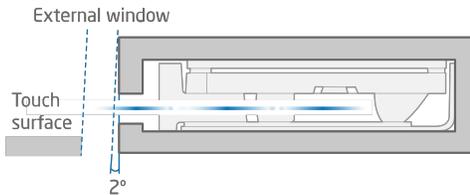
- Transmission: > **88 % at 945nm**
- Haze: < **3%**
- Surface finish: **SP1-A2 (max Ra 0.05µm)**.

Proven plastic materials include optical grade acrylic (PMMA) and polycarbonate. For glass windows, transmission at 945 nm must be verified. Many borosilicate glasses (such as Borofloat) work well, but some common window glasses show substantial absorption due to high iron content.

Geometrical Constraints

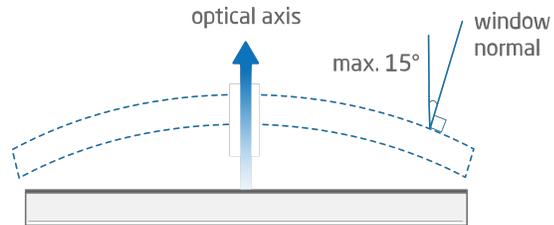
The zForce AIR Touch Sensor is an optical system that both emits and receives IR-light at different incident angles. When the light hits a transparent material, most of the light is transmitted through the material and exit on the other side. But in reality the amount of light being transmitted is angle dependent, why some shape constraints exist on windows placed in front of the sensor:

- **Window surfaces must be parallel.**
A wedge, or lens shaped window will shift light beams out of the active area.
- It is a good practice to install the window at a slight angle ($\sim 2^\circ$) to reduce reflected stray light. See the image below. The angle can be up to approximately 30° without affecting performance.

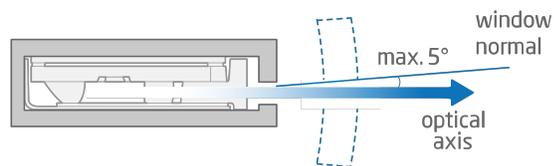


- A slight curvature on the window can be allowed.

- In x-direction, a maximum angle of 15° between window normal and sensors optical axis is recommended, for all parts of the window within the sensor TAA.



- In z-direction, the angle should be maximum 5°.



, which corresponds to a minimum radius of 12 mm for the surface closest to the sensor.

- Keep window thickness as small as mechanically feasible, to reduce absorption losses.

More Specifications

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