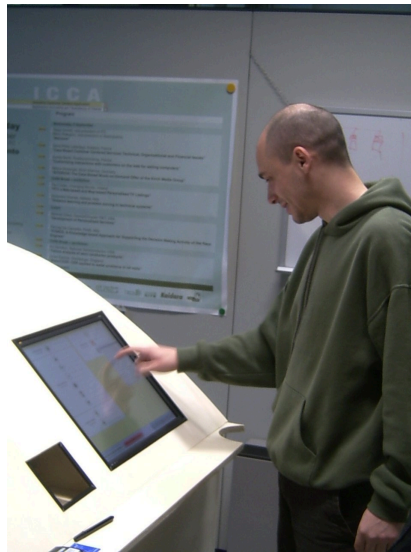


The simple comparison: benefits, compromises and selection

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Touch kiosk: screen angle, reach and target size are integration choices.

Maurizio Napolitano from Trento, Italy | [Source](#) | [CC BY 2.0](#). Unmodified photograph; scaled for display.

A useful first shortlist

Resistive touch detects a physical press; it accepts many glove and stylus types but needs force and a deformable sensing structure. Projected capacitive, or PCAP, detects an electrical field change; it supports a clean glass front and rich multitouch, with tuning needed for gloves, water and electrical noise. Infrared detects interrupted light paths; it can keep sensing electrodes out of the view but needs optical paths around the perimeter.

Surface acoustic wave, or SAW, detects changes to waves travelling along glass. Optical camera and shadow systems infer position from light patterns. Pen digitizers add a specialized precision tool. Force sensing and haptics add information or feedback; neither automatically supplies a complete finger-touch system.

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Compare conditions, not slogans

Family	Primary attraction	Main design question
Resistive	Gloves and passive tools	Force, wear, optical stack and required contact count
Surface capacitive	Simple glass-based legacy solution	Conductive coupling, single-touch needs and lifecycle
PCAP	Flush glass, multitouch	Signal margin through the actual cover and glove
IR grid	Large areas; no conductive touch required	Object size, IR blocking, sunlight and bezel geometry
Optical/shadow	Position from multiple optical views	Geometry, contamination and emitter interactions
SAW	Glass surface and light touch	Acoustic absorption and edge construction
Pen digitizers	Precise writing and drawing	Compatible pen, protocol and display mapping
Force sensing	Applied force or deliberate confirmation	Mounting, calibration and position-sensing method

IR sensing does not require electrical conductivity, but the object must sufficiently block the infrared paths and meet the system's minimum detection size. Pen input, force measurement and haptic feedback are distinct functions; choose the combination the task requires.

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Tradeoffs become requirements

Begin with exclusion criteria: a mandatory glove, a forbidden raised bezel, a required stylus, or an unacceptable emission may eliminate a candidate. Then compare the survivors using measured evidence and lifecycle cost: sensor, controller, glass, integration, tooling, qualification, service and replacement.

A weighted score is useful only after mandatory requirements pass. Do not let several convenient features outweigh a failed critical requirement. Record unknowns as unknowns, not average scores.

Compare matched configurations. A lab demo on thin glass and a rugged assembly with a heater, thick cover and long harness are different systems. Request test conditions with any claimed accuracy, sunlight immunity or wet-glove performance.

Apply the idea

Choose two candidates for a wet outdoor kiosk with gloves. Name the evidence that would decide between them.

Discussion: A tuned PCAP assembly and an optical/IR assembly are plausible candidates. Compare the actual gloves, water film and droplets, solar incidence, edge performance, false touches, cleaning and mechanical envelope. Resistive may also fit if the interaction and durability requirements allow.

References:

- S01 Elo - [AccuTouch five-wire resistive operation](#)
- S06 Microchip - [Moisture tolerance](#)
- S07 Microchip - [Automotive touchscreen controllers: gloves, moisture and signal processing](#)
- S08 Elo - [Infrared beam-grid operation](#)
- S11 Elo - [IntelliTouch/SecureTouch surface acoustic wave operation](#)
- S14 Wacom - [EMR and active electrostatic pen technologies](#)
- S15 Ultraleap - [Focused-ultrasound haptics](#)
- S41 IRTOUCH Systems - [E/E2/IX Series infrared touchscreen: IR-opaque activation objects and minimum size](#)