

The New Norm: Technologies Behind the Touchless Restroom



Picture yourself stepping into a restroom where everything seems to anticipate your actions. As you approach the faucet, the water turns on. The soap dispenser releases just the right amount of soap with a wave of your hands. An IR LED pair causes the toilet to flush automatically and hygienically as you leave. This is the touchless technology experience, and it is transforming everyday spaces like restrooms into areas of convenience and cleanliness.

Have you wondered how these touchless features work? For engineers, the “magic” of touchless restrooms lies not in the user’s experience, but in the complex workings between infrared (IR) LEDs, electronics and innovative engineering.



The Technology Behind Infrared (IR) LEDs in Touchless Environments

IR LEDs play a critical role in touchless applications, including in touchless restrooms. But how do they work?

Touchless technology relies heavily on infrared (IR) LEDs, which emit and detect invisible light with a longer wavelength than what meets the human eye. This technology is ideal for presence detection because it’s easy to control and focus.

In the arena of touchless restrooms, a common approach uses an [IR emitter](#) and photodiode pair to create a proximity sensing function. The IR emitter sends out IR light pulses. When an object, like your hand, comes within range, the IR light bounces back and the photodiode detects it, triggering the system to activate.

American Bright’s IR emitters are specifically designed for high performance and reliability in touchless applications. They offer several advantages over alternative solutions:

Tight Beam Pattern:

American Bright IR LEDs emit a focused beam of light, minimizing interference from external factors like background light or reflections from nearby surfaces. This ensures accurate detection even in busy restrooms with multiple fixtures or bright lighting.

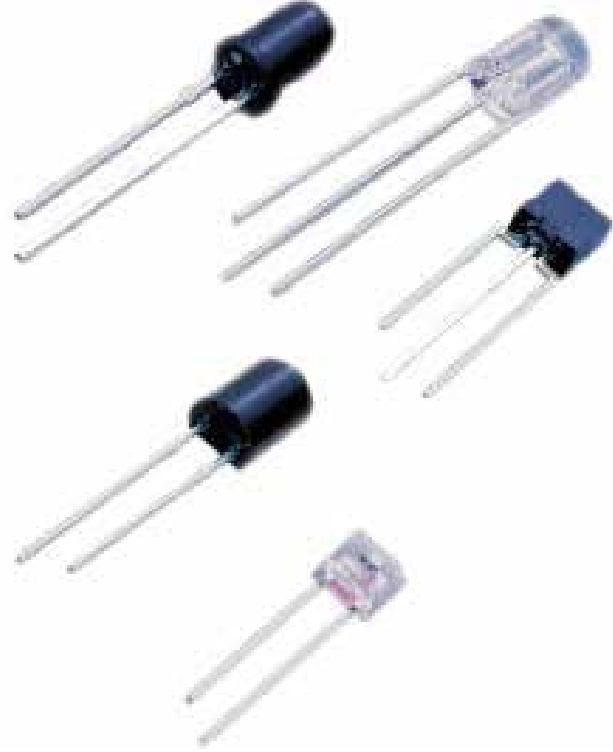
Consistent Output:

American Bright’s IR emitters deliver consistent light output over time, reducing the risk of malfunctions due to fluctuating signal strength. This translates to a more reliable user experience in touchless restrooms.

Long Operating Life:

American Bright IR LEDs are built to last, ensuring reliable performance for years to come. This translates to lower maintenance costs for building owners and facility managers.

American Bright, a leader in IR technology products, manufactures the critical IR components used in detecting motion, which can also be used in applications including security systems and motion-activated lighting. Let’s see how these IR LEDs they translate into a real-life touchless restroom experience.



The Touchless Restroom Walkthrough

As a person approaches a restroom equipped with touchless systems, here are the IR LED-based systems they could encounter. You have probably experienced many, if not all, of these touchless features in a heavily trafficked restroom (such as those found in airports or restaurants):

Automatic-flushing toilets

IR emitters and photodiodes in automatic-flushing toilets should be properly calibrated to effectively identify when someone is using the toilet, but avoid going off from small movements. This provides a hygienic environment while preventing unexpected or premature flushes. While IR LED pre-calibration is usually set by the manufacturer, qualified installers might have access to tools to fine-tune LED sensitivity.

Automatic faucets

Finding the ideal placement for touchless faucet IR LED pairs balance the user experience with reliable IR LED detection. Engineers should consider factors like handwashing position, reach limitations and minimizing accidental activation from external factors like reflective surfaces or ambient lighting.

IR LED-activated soap dispensers

IR technology is also used in IR LED-activated soap dispensers. American Bright offers a variety of high-performance IR LEDs specifically designed for touchless applications. Ensuring the correct sensitivity is crucial for the automatic soap distribution. By carefully calibrating LED sensitivity, engineers can achieve a balance between reliable detection and avoiding false triggers. The IR LED angle also plays into optimal performance. The LED should be positioned to detect hands reaching for the soap, and not simply waving past the dispenser.



Key Advantages of the Touchless Restroom

While the outward-facing benefits of touchless restrooms are evident in a user’s overall experience, there are also some key advantages for building owners and facilities staff members.

Improved Hygiene

Touchless technology goes beyond basic germ reduction. Touchless fixtures break the chain of germ transmission. By eliminating the need to touch surfaces and objects in the restroom, users leave fewer germs behind. By reducing fingerprints and soap residue on faucets and dispensers, touchless tech helps to make these surfaces easier to clean, encouraging a more hygienic restroom environment.

Convenience and Ease of Use

Advanced touchless features make the restroom experience more convenient and user-friendly. These conveniences can empower users with disabilities to navigate the space independently.

Optimizing Water Usage

Remembering to turn off the faucet is no longer necessary with touchless systems. This simple feature can significantly reduce water waste. Touchless faucets can be equipped with automatic shutoff timers, further reducing excessive water usage.

American Bright: The IR LED Leader

Touchless restrooms leverage hand wave technology, representing the future of restroom innovation. By incorporating touchless technology into restrooms, users will benefit from a hygienic, convenient experience.

American Bright is a leader in IR technology, offering a complete line of advanced through-hole and SMT IR devices suitable for both digital and analog control system. Our [product selection](#) includes discrete IR emitters, photo transistors, photo diodes, receiver modules, photo couplers and a broad range of photo interrupters.

American Bright offers a robust catalog of high-performance [Infrared Products including High Power IR Emitters](#) for a wide range of touchless applications, and we have a team of specialists dedicated to working with customers on custom product designs. [Contact American Bright](#) to discuss your next project.