

ESP D-Lux Prototype Testing Phase 1 - Shutter Reliability and Door Sensor Function

Test Environment

In this phase the test unit was placed in an unoccupied patient room within the clinical services area of Via Christi Hospital on St Francis Street. The room was 18 by 13 feet with a window on the south wall and the entry door on the north wall. To the east of the entry door was a bathroom. The device was placed next to the west wall on a table 13 feet from the entry door and 3 feet off the floor. A continuous recording video camera was placed 18 feet from the door in a position to record both the door opening and the activation of the unit. Temperature was maintained at ##### to ##### during the test period. Test was done on 8/29/2012

Device Settings

The test device was set to detect the signal from a door sensor installed on the entry door. All other sensors were disabled. The door sensor was installed using double sided tape to both the door and door frame. The UV bulb was removed and an LED lamp installed in the circuitry to simulate the UV light. The time between door closing and device shutter reopening was set to 5 seconds. The delay on the light circuit was set to turn on 3 seconds after the shutter opened. This resulted in a total delay of 8 seconds between entry door closing and shutter opening and device lighting.

Experiment activities

Once the device was installed and the video camera functioning ,one of the test personnel sat at the nurse's station with a view of the outside hallway and the door. They also observed the video monitor receiving the video feed from the room containing the test device. This person had a two key counter on which they recorded each instance the door was opened and whether the device shutter closed appropriately (defined as device light turned off instantly and shutter closed smoothly within 2 seconds). A second test personnel opened the door, stepped in the room and observed the device then stepped out of the room and closed the door. This operation was repeated 1,000 times.

Results

Event	Count
Number of times the door opened and closed	1,000
Number of times the light failed to turn off properly	0
Number of times shutter failed to close	0
Number of times shutter failed to reopen	0
Number of times the lamp failed to light	0

Note: When the door was reopened at the exact instance the light went back on there was a slight delay in the shutter closing but it did close within 2 seconds and the light shut off immediately and was not observed by the test personnel. This is likely due to slight electrical interference and is a result of the test operations (rapid reopening of the door) unlikely to be replicated under normal usage.

Discussion

Independent test personnel observed no occurrence of device failure during this experiment. When the light was allowed to be on for a second before the door was reopened the shutter moved quickly and smoothly to the closed position. Even when there was interference the light went out instantly and was never observed by the personnel opening the door and the shutter closed within 2 seconds.

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