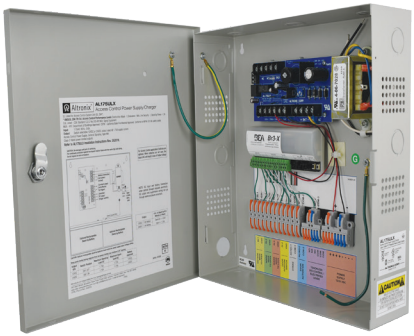
MAGIC SWITCH® RESTROOM KIT

Touchless restroom kit for single occupancy, normally locked/unlocked restrooms

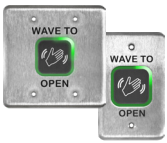
Visit website for available languages of this document.



Power Supply Cabinet + Logic Module
(10PS-RR)

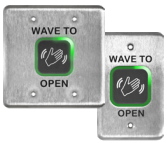
Door Position Switch
(50.5283)

EXTERIOR ACTUATOR
(MS42 family)



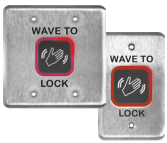
double-gang or single-gang

INTERIOR ACTUATOR - opening
(MS42 family)



double-gang or single-gang

INTERIOR ACTUATOR - locking
(MS42 family)



double-gang or single-gang

+ + +

COMPATIBLE MOUNTING BOXES
(MAGIC SWITCH Surface-Mount Boxes)

double-gang or single-gang

double-gang or single-gang

double-gang or single-gang

+ +

COMPATIBLE WALL DECALS

Wall Decal - exterior
(74.0017)

not required

Wall Decal - interior
(74.0019)

PRECAUTIONS

- ❑ Shut off all power going to header before attempting any wiring procedures.
- ❑ Maintain a clean and safe environment when working in public areas.
- ❑ Constantly be aware of pedestrian traffic around the door area.
- ❑ Always stop pedestrian traffic through the doorway when performing tests that may result in unexpected reactions by the door.
- ❑ *ESD (electrostatic discharge)*: Circuit boards are vulnerable to damage by electrostatic discharge. Before handling any board, ensure you dissipate your body's ESD charge.
- ❑ Always check placement of all wiring before powering up to ensure that moving door parts will not catch any wires and cause damage to equipment.
- ❑ Ensure compliance with all applicable safety standards (i.e. ANSI A156.19) upon completion of installation.
- ❑ DO NOT attempt any internal repair of the components. All repairs and/or component replacements must be performed by BEA, Inc. Unauthorized disassembly or repair:
    1. May jeopardize personal safety and may expose one to the risk of electrical shock.
    2. May adversely affect the safe and reliable performance of the product resulting in a voided warranty.

INSTALLATION TIPS

- The door control system and the header cover profile must be correctly grounded.
- Only trained and qualified personnel are recommended to install and set up the sensor.
- Ensure that all mounting locations are clean and properly prepared before installation.
- Always test the proper operation of the installation before leaving the premises.
- The warranty is invalid if unauthorized repairs are made or attempted by unauthorized personnel.
- Do not use harsh cleaning agents to clean polycarbonate materials. Harsh cleaning agents (e.g. ammonia) can cause damage to these materials. BEA recommends using clean, lukewarm water and a soft, lint-free cloth to clean sensor windows and other polycarbonate surfaces on our products.
- A store room function lever is recommended for this application to be a fully touchless system.
- Be sure to perform a tug test each time a wire is terminated at the power supply cabinet terminals to ensure that the wire is connected securely.

BEA, INC. INSTALLATION/SERVICE COMPLIANCE EXPECTATIONS

BEA, Inc., the sensor manufacturer, cannot be held responsible for incorrect installations or incorrect adjustments of the sensor/device; therefore, BEA, Inc. does not guarantee any use of the sensor/device outside of its intended purpose.

BEA, Inc. strongly recommends that installation and service technicians be AAADM-certified for pedestrian doors, IDA-certified for doors/gates, and factory-trained for the type of door/gate system.

Installers and service personnel are responsible for executing a risk assessment following each installation/service performed, ensuring that the sensor/device system performance is compliant with local, national, and international regulations, codes, and standards.

Once installation or service work is complete, a safety inspection of the door/gate shall be performed per the door/gate manufacturer's recommendations and/or per AAADM/ANSI/DASMA guidelines (where applicable) for best industry practices. Safety inspections must be performed during each service call – examples of these safety inspections can be found on an AAADM safety information label (e.g. ANSI/DASMA 102, ANSI/DASMA 107, UL294, UL325, and International Building Code).

Verify that all appropriate industry signage, warning labels, and placards are in place.

AAADM ANSI Member DASMA Door & Access Systems Manufacturers Association International IDA International Door Association Enhancing the Value and Professionalism of Door & Access Systems Dealers

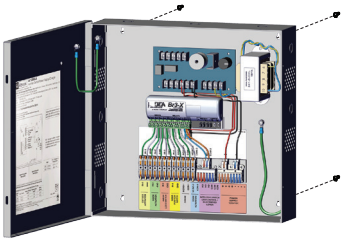
MOUNT CABINET

1 If necessary for the application, run site power and all device cabling through the appropriate knockout on the power supply cabinet.

2 Holding the power supply cabinet in the desired location, mark mounting holes and then drill pilot holes, insert wall anchors (if necessary), and then fasten screws* 75% into the anchors.

Place cabinet over protruding screws and then finishing fastening screws to secure the cabinet to the wall.

* not provided



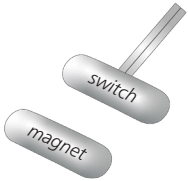
3 Wire the door control activation to the power supply cabinet. See Appendix (page 5) for specific terminal location. Refer to the system wiring diagram (80.0435) if necessary.

INSTALL DOOR POSITION SWITCH

4 **SWITCH**

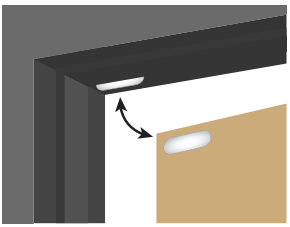
Choose a mounting location as close as possible to the leading edge of the door to ensure immediate break.

Peel the backing from the switch and adhere the switch in the desired mounting location. Ensure it is fully attached to the door frame.



5 **MAGNET**

Peel the backing from the magnet and adhere the magnet in the desired mounting location. Ensure it is fully attached to the door.



6 Strip the door position switch wires appropriately, and then wire to the power supply cabinet.
See Appendix (page 5) for specific terminal location. Refer to the system wiring diagram (80.0435) if necessary.

INSTALL ELECTRIC STRIKE

7 Mount and wire the electric strike according to the manufacturer's instructions.

Strip the electric strike wires appropriately, and then wire the electric strike to the power supply cabinet. See Appendix (page 5) for specific terminal location. Refer to the system wiring diagram (80.0435) if necessary.

Refer to page 5 for more information on wiring and configuration of the electric strike.

INSTALL ACTUATORS

8 Determine appropriate mounting locations for all three actuators.

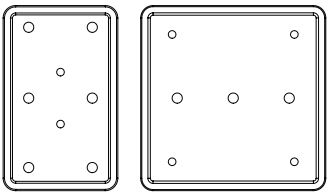
IMPORTANT: Ensure that the two interior actuators are spaced at least 12" apart (measured center-point to center-point) to avoid radar interference.

9 **MOUNTING BOX (optional)**

Install the mounting box using the pilot hole locations. Do not drill outside of the pilot hole locations (see images, right).

If a wire conduit is required, you may also use any of the pilot hole locations.

IMPORTANT: To achieve an IP65 rating, you must apply silicone to any drilled holes.



SINGLE GANG *DOUBLE GANG*

See MAGIC SWITCH SURFACE-MOUNT BOXES User's Guide (75.1222) for more information, if necessary.

10 **INSTALL ACTUATORS**

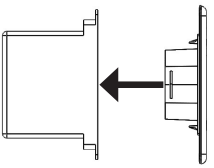
Strip the actuator wires appropriately, and then wire the actuators to the power supply cabinet. See Appendix (page 5) for specific terminal location. Refer to the system wiring diagram (80.0435) if necessary.

Before installaing the actuator in the box, verify that all DIP switches are set to OFF and that the potentiometer is in a fully CCW position.

Place the silicone seal around the cube.

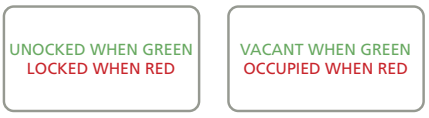
Orient the cube with the DIP switch banks at the top, and then apply the face plate (right side up) by snapping it onto the cube.

Insert the actuator into the box, and then secure it using the provided screws. *Use security screws for tamper resistance, if desired.*

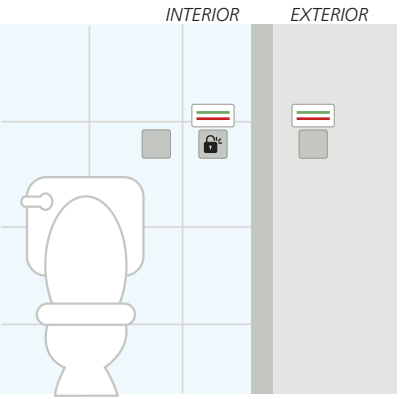


11 **WALL DECALS - if desired/required***

Apply the wall decals above each actuator (as shown, right).



INTERIOR *EXTERIOR*

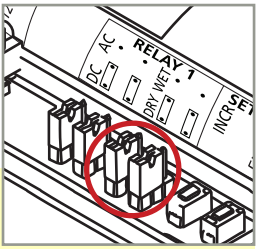


* desired = application will align with the red/green indications as described in the images provided in this section (see page 8 for more information on LED color selections)

required = refer to any/all regulations, codes, and standards relevant to this installation

CHECKPOINT

12 LOGIC MODULE OUTPUT



Be sure that the BR3-X WET/DRY jumpers available at Relay 1 are set appropriately for your application before applying power to the system.

PRECAUTIONS TO OBSERVE WHEN USING A 'WET' OUTPUT

- Never change the jumper settings when the module has power connected to it or when a load is applied.
- Never allow 2 different voltage sources to be connected to the load (electric strike for example) at the same time. This can result in serious damage to equipment.
- Always move both jumpers when changing a jumper set.
- If an EL device is being powered by a power source other than BR3-X, DO NOT select the 'WET' output option on the BR3-X. If 'WET' is selected, the next activation of the module will send a voltage to the load and if there is already a voltage being applied from another source, the BR3-X and possibly the load will be permanently damaged.
- When using the 'WET' output option on the BR3-X, set all desired switch positions ('WET' – 'DRY' and AC – DC) before the module is powered and before any loads are applied.
- When DC 'WET' output is selected, COM terminal is positive(+) and the ground(-) is switched between NO and NC.
- Ensure there is no other voltage connected to the load. Whatever the Input voltage is at the BR3-X, the output will correspond.

13 LOCKSET

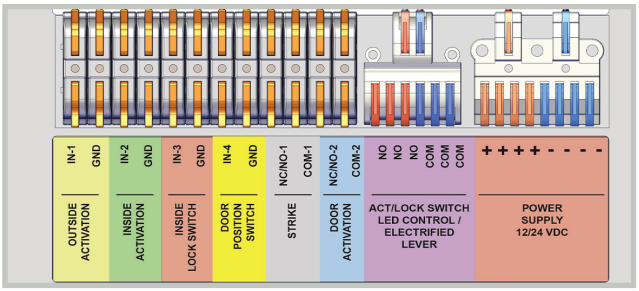
If an electrified lockset has been installed, ensure that it has been wired into the system appropriately, and as detailed above. Refer to the system wiring diagram (80.0435) if necessary.

POWER ON

14 After all wiring has been verified, apply power to the system.

APPENDIX

TERMINAL LOCATIONS

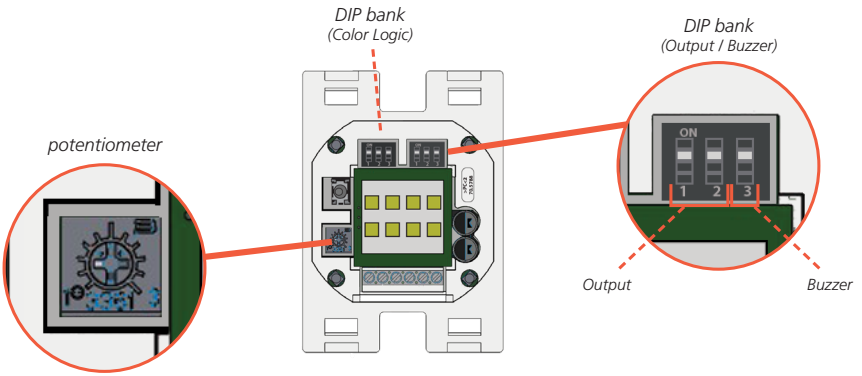


15 ACTUATORS

Following power-on, check functionality for all actuators.

If adjustments are needed, remove the faceplate from the actuator by using a flathead screwdriver to loosen the assembly at the top or bottom set of snap fittings.* This allows access to the PCBA in order to make adjustments to the DIP switches and potentiometer.

See below for necessary settings for the restroom application. Also, more settings and available parameters are accessible via remote control (see page 8).



INTERIOR/EXTERIOR ACTIVATION

OUTPUT MODE: both DIP swtiches OFF for pulse/N.O.

BUZZER: DIP 3 set to OFF for no buzzer; switch to ON for buzzer upon detection

LED COLOR: all DIP switches OFF for green = no detection, red = detection

RANGE: potentiometer set to minimum by default; turn clockwise to increase range (max. 23")

LOCKING

OUTPUT MODE: both DIP swtiches OFF for pulse/N.O.

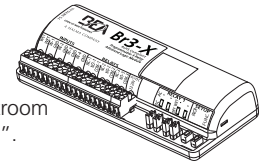
BUZZER: default set to the short buzzer; can only be changed via remote control (see page 8)

LED COLOR: all DIP switches OFF for green = no detection, red = detection

RANGE: potentiometer set to minimum by default; turn clockwise to increase range (max. 23")

PROGRAMMING COMPONENTS

16 LOGIC MODULE



1. The BR3-X is defaulted to the "00" function. Based on the restroom application, you must change this setting to either "nL" or "nU".

2. Once the BR3-X function is set, select the hold time (h1, h2) and delay time (d1).
   - nU = h2, d1
   - nL = h1 and h2, d1 (Note: Hold time h1 must be greater than the delay time when in nL mode.)

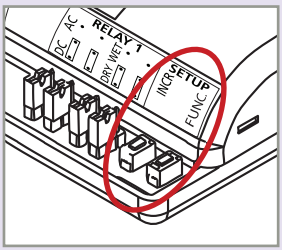
3. Set the hold time for the relay(s) to ≥ 1 second.
   Set the delay time to ≥ ¼ second.

LOGIC MODULE: FUNCTION DESCRIPTIONS	
BR3-X FUNCTION	Function Description
nL (normally locked)	Exterior "wave to open" actuator unlocks strike and opens door Interior "wave to open" actuator unlocks strike and opens door Interior "wave to lock" actuator deactivates "wave to open" exterior
nU (normally unlocked)	Exterior "wave to open" actuator opens door Interior "wave to open" actuator opens door Interior "wave to lock" actuator deactivates "wave to open" exterior + locks strike DPS resets system

PARAMETER DESCRIPTIONS		
h1	relay 1 hold time	01 to 60 seconds countdown begins AFTER release of input 1 or WET input
h2	relay 2 hold time	01 to 60 seconds countdown begins AFTER d1 (delay between relay 1 and relay 2) expires
d1	delay between relay 1 and relay 2	-1 = ¼ seconds, -2 = ½ seconds, -3 = ¾ seconds, 01 to 60 seconds delay begins AT activation of input 1 or WET input

HOW TO CHANGE SETTINGS

1. Press and hold **INCR** + **FUNC** for 3 seconds.
2. Display will toggle between FF and 00 for 5 seconds.[1,2]
3. While FF / 00 is displayed, press **INCR** to cycle through functions.
4. Once desired function is selected, press **FUNC** to cycle through parameters.
5. Display will toggle between parameter and its current value for 5 seconds.
6. Press **INCR** to cycle through parameter's values.
   Note: Pressing and holding **INCR** will rapid cycle.
7. Repeat these steps until all function parameters are set.
8. Wait 5 seconds for BR3-X to save and display function.



FINISH

17 TEST INSTALLATION OF SYSTEM

Verify using the Function Description table above.

Once installation is complete, be sure to secure the power supply cabinet.

MS42 SETTINGS VIA REMOTE CONTROL

When all actuators are disengaged

RANGE

To change these settings by remote control, the potentiometer must be set to minimum.

0	1	2	3	4	5	6	7	8	9
small	>	>	>	>	>	>	>	>	large

OUTPUT MODE

To change these settings by remote control, DIP 2 (Output/Buzzer bank) must be set to OFF.

0	1	2	3	4	5
pulse N.O.	toggle N.O.	pulse N.C.	toggle N.C.	pulse frequency	toggle frequency

HOLD TIME

When OUTPUT MODE is set to pulse

0	1	2	3	4	5
0.5 s	1 s	2 s	3 s	4 s	5 s

LED COLOR

To change these settings by remote control, DIPs 1, 2, and 3 (Color Logic bank) must all be set to OFF.

Discard wall decals for actuators if LED color configurations are changed.

	0	1	2	3	4	5	6	7
A	*off*	*red*	*green*	*blue*	*yellow*	*pink*	*turquoise*	*white*
B	*off*	*red*	*green*	*blue*	*yellow*	*pink*	*turquoise*	*white*

LED ANIMATION

F1	1	2	3	4	5	6	7	8

LED BRIGHTNESS

D	1	2	3

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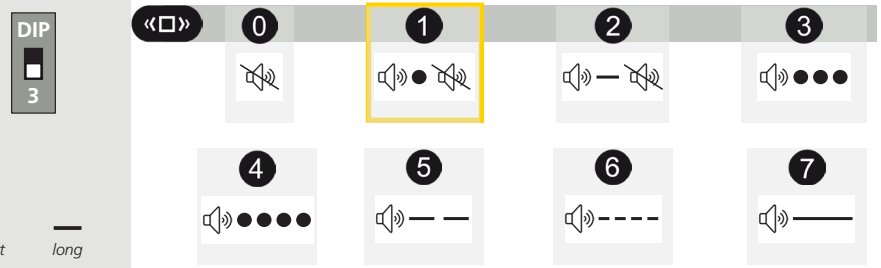
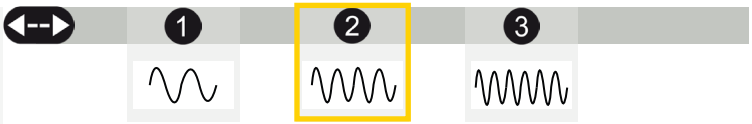
BUZZER

To change these settings by remote control, DIP 3 (Output/Buzzer bank) must be OFF.



BUZZER TONE

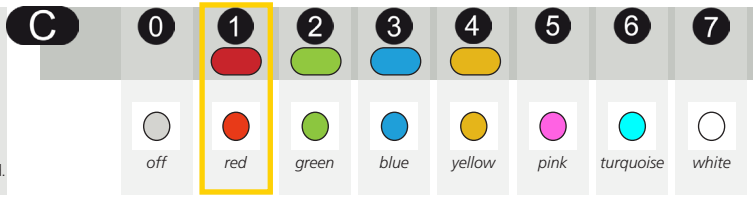


MS42 SETTINGS VIA REMOTE CONTROL

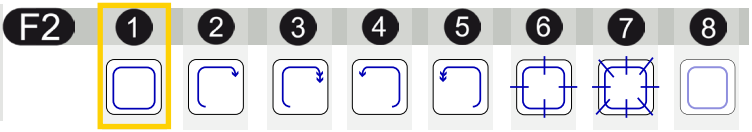
When the locking actuator is engaged

COLOR LOGIC*

Discard wall decals for actuators if LED color configurations are changed.

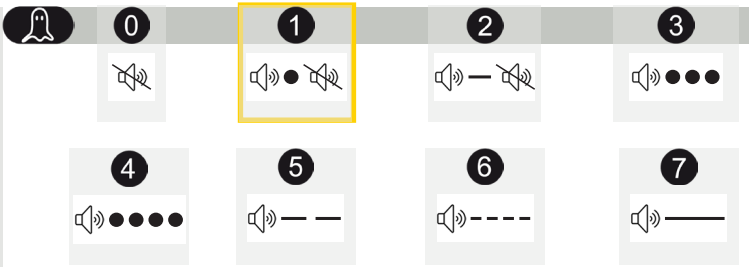


LED ANIMATION



BUZZER

when in detection



TECHNICAL SPECIFICATIONS

Specifications are subject to change without prior notice.
All values measured in specific conditions.

POWER SUPPLY ENCLOSURE

Agency listings	UL Listed for Access Control Systems (UL294*) - file #BP6714 cUL Listed - CSA Standard C22.2 No.205-M1983, Signal Equipment CSFM - California State Fire Marshal Approved MEA - NYC Dept. of Buildings Approved NFPA 101 (Life Safety) * ANSI/UL 294 7th Ed. Access Control Performance Levels: Destructive Attack - I; Endurance - N/A; Line Security - I; Stand-by Power - I, IV
Input	115VAC, 60Hz, 0.6A.
Output	12VDC or 24VDC selectable output Class 2 Rated power-limited outputs 1.75A continuous supply current @ 12VDC or 24VDC Aux relay output (form "C" contacts) Filtered and electronically regulated output Short circuit and thermal overload protection
Supervision	AC fail supervision (form "C" contacts) Dry trigger output (form "C" contacts)
Fire alarm interface	Dry trigger input
Visual indicators	AC input and DC output LED indicators
Added features	Includes power supply, transformer, and enclosure
Enclosure dimensions	13.5" × 13" × 3.25" (342.9mm × 330.2mm × 82.6mm)

LOGIC MODULE

Supply voltage	12 – 24 VAC/VDC ±10%
Current consumption	30 – 130 mA (DRY output)
Temperature rating	-15 – 150 °F (-26 – 150 °C) If powered by AC voltage and using WET output to convert to DC voltage and current draw of device is greater than 0.9 A, the upper temperature range is 130 °F (54 °C).
Input Input 1, 2, 3, 4 WET input	 DRY contact 5-24 VAC/VDC ±10%
Contact rating relay 1 (DRY) relay 1 (WET) relay 2 relay 3	 3 A @ 24 VAC or 30 VDC 1 A 3 A @ 24 VAC or 30 VDC 1 A @ 24 VAC or 30 VDC
Dimensions	5.2" x 2.2" x 1" (133 mm x 55 mm x 25 mm)
Housing	ABS - white translucent

DOOR POSITION SWITCH

Gap distance	0.43"
Loop	open
Reed form	N.C.
Max. contact rating	3 W
Max. initial contact resistance	100 mΩ
Max. switching voltage	30 VAC/VDC
Max. switching current	0.2 A

Color	white
Leads length	12", 22 AWG
Contact size	1.1" (L) × 0.37" (W) × 0.19" (H)

MS42 TECHNICAL SPECIFICATIONS

Technology	microwave motion sensor
Radiated frequency	24.150 GHz
Radiated power	< 20 dBm EIRP
Radiated power density	< 5mW/cm^2
Detection range	4 – 24" (adjustable)
Detection mode	motion (bidirectional)
Speed of target to create detection	5Hz (min) or ± 1 in/s 200Hz (max) or ± 3 ft/s
Supply voltage*	12 – 24 VAC ±10% 12 – 24 VDC +30% / -10%
Supply frequency	50 – 60 Hz
Power consumption	< 1.5W
Output* max. voltage max. current max. switching power	Electronic relay (galvanic isolation - polarity free) 42 VDC / 30 VAC 100 mA 15 W
Output hold time	0.5s (in PULSE mode)
Temperature range	-20 – 55 °C
Wiring cable	Stranded cable up to 16 AWG - 1.5mm^2
IP rating	IP55 *Apply silicone as directed to achieve IP65*
Certification	Electromagnetic compatibility (EMC) according to 2004/108/EC FCC: G9B-210161 IC: 4680A-210161

* External electrical sources must be within specified voltages (max 15 W) and ensure double insulation from primary voltages.

FCC APPROVAL

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada.
Operation is subject to the following two conditions:

*this device may not cause harmful interference, and

*this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

*Reorient or relocate the receiving antenna

*Increase the separation between the equipment and receiver

*Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

*Consult the dealer or an experienced radion/TV technician for help

WARNING: CHANGES OR MODIFICATIONS TO THIS EQUIPMENT NOT EXPRESSLY APPROVED BY BEA INC. MAY VOID THE FCC AUTHORIZATION TO OPERATE THIS EQUIPMENT.

TROUBLESHOOTING

Door does not open or lock upon hand wave	Bad or no power supply	Check power supply. If LED switches on or flashes, power connection is OK.
	Detection range is too short	Adjust the detection range.
		Remove any metal plates in front of the sensor.
	Incorrect wiring / connection	Check wiring and relay connection.
	DPS not making contact (input 4 does not close)	Check that DPS is installed properly and it is making contact when the door is closed.
Sensor stays in detection	The environment influences the good functioning of the sensor	Remove any moving object around the sensor.
	Incorrect wiring / connection	Check wiring, relay, and electric strike connection(s).
Door remains open after detection/activation	Wrong output mode	Switch the output mode to PULSE.
	Incorrect wiring / connection	Check wiring and relay connection.
BR3-X will not react to any inputs	Incorrect power	Verify power supply of 12 to 24 VAC/VDC +/- 10% is wired to correct terminals.
	Not programmed, BR3-X displaying 00	Ensure a function is programmed, BR3-X does not show 00, and all 'h' values are set to at least 01.
	Incorrect wiring	Verify wiring is applied exactly as described for specific function programmed.
	Defective BR3-X	Replace BR3-X.
BR3-X has no output	Incorrect output devices	Ensure proper devices are connected to outputs for the specific function programmed.
	Not programmed, BR3-X displaying 00	Ensure a function is programmed, BR3-X does not show 00, and all 'h' values are set to at least 01.
	Incorrect wiring	Verify wiring is applied exactly as described for specific function programmed.
	Incorrect jumper settings	Ensure all jumpers are configured correctly for specific application.
	Defective BR3-X	Replace BR3-X.
BR3-X output is constant/ maintained	One or more of IN-1 through IN-4 have shorted	Resolve respective short.
E1, E2, E3, E4, E5	EEPROM error	Reset BR3-X and reprogram.

Before contacting BEA Technical Support, locate the serial number of restroom kit. This will be found on the back of the BR3-X module within the power supply cabinet.

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