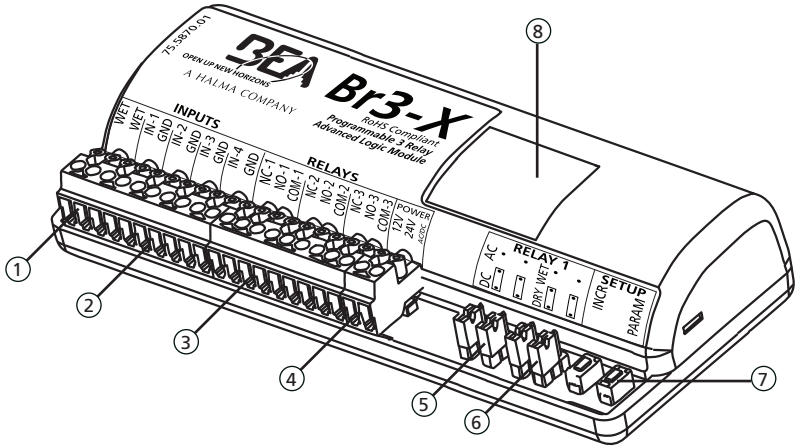
# BR3-X

## Programmable 3 Relay Advanced Logic Module & Restroom Controller

(US version)

## DESCRIPTION




1. WET input
2. DRY inputs
3. Relay outputs
4. Power input
5. AC/DC jumpers
6. WET/DRY jumpers
7. Programming buttons
8. 7-segment display

## ACCESSORIES

10RESTROOMKIT: Restroom Control Kit

| COMPONENT | DESCRIPTION | PART NUMBER |
|---|---|---|
| Logic module | Br3-X restroom controller | 10BR3X |
| Door position switch | NO/NC magnetic door position switch | 10SWITCH1084 |
| Occupied indicator | Lock status indicator with LED and sounder | 10LEDSOUNDER |
| "PUSH TO LOCK" Button | Door lock actuator with LED | 10PTLBUTTON |

10EMERGENCYKIT: Emergency Add-On Kit

| COMPONENT | DESCRIPTION | PART NUMBER |
|---|---|---|
| Assistance Required Signal | Corridor LED with sounder | 10ARS |
| Emergency Signage | Emergency instruction signage | 70.5675 |
| "PUSH FOR EMERGENCY ASSISTANCE" Button | Emergency assistance request button with LED and sounder | 10BUTTONCOMBO |

- The device should not be used for purposes other than its intended use. All other uses cannot be guaranteed by the manufacturer of the sensor.
- The installer of the door system is responsible for carrying out a risk assessment and installing the sensor and the door system in compliance with applicable national and international regulations and standards on door safety.
- The manufacturer of the sensor cannot be held responsible for incorrect installations or inappropriate adjustments of the sensor.

## PRECAUTIONS

CAUTION

- ❑ Shut off all power going to header before attempting any wiring procedures.
- ❑ Maintain a clean & 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 A156.10) 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.

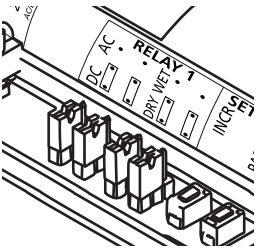
## JUMPERS

**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 separate power source, 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. The following can also be observed:
  1. If voltage Input at the Br3-X is AC, then output selection can be AC or DC.
  2. If voltage Input at the Br3-X is DC, then output selection can only be DC.
  3. The maximum load applied to Relay 1 should never exceed 1A. If more than one device is to be connected, add the consumption values together for a total value. If current is excessive, damage to equipment can result.
  4. On the Br3-X, the 'WET' output is only available at Relay 1.
- ❑ When supplying Br3-X with AC input voltage, and selecting 'WET' output on relay **with** DC conversion, you actually get rectified AC voltage, which is identical to applying a bridge rectifier to any AC voltage.

CAUTION: Relay 1 'WET' OPTION IS ACTIVE FOR ALL FUNCTIONS!

| RELAY 1 OUTPUT | DRY/WET JUMPER[2] | AC OUTPUT VOLTAGE[3] | DC OUTPUT VOLTAGE[4] |
|---|---|---|---|
| DRY | both jumpers set to DRY | N/A | N/A |
| WET[1] | both jumpers set to WET | both jumpers set to AC | both jumpers set to DC |




**NOTES**:

1. "WET output" allows the Br3-X to supply a voltage output of up to 1 A on relay 1 for powering maglocks or electric strikes directly from the Br3-X. Rating of power supply powering the Br3-X must be at least 1 A.
2. Default jumper settings make relay 1 DRY.
3. AC voltage only available if Br3-X is powered by AC voltage.
4. DC voltage available if Br3-X is powered by AC or DC voltage.

## WIRING

Each Br3-X function is wired differently. Please review and follow the appropriate wiring diagram shown for each function.

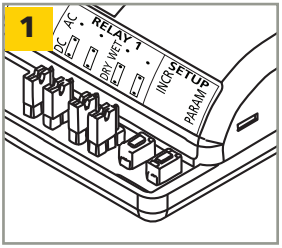
## FUNCTIONS

| FUNCTION | DESCRIPTION | LOGIC |
|---|---|---|
| 10 | timer | • activation of **relay 1** via trigger of **input 1**<br>• **reverse logic** available |
| 11 | ratchet / latching | • ratchet/latching of **relay 1** via trigger of **input 1** |
| 22 | 2-relay sequencer<br>+ inhibitor | • sequence of **relay 1** and **relay 2** with inhibiting of **input 1** until **input 2**, **input 3**, or **WET input** is triggered<br>• activation of **input 4** reinhibits **input 1** |
| 28 | 2-relay sequencer<br>+ door position | • sequence of **relay 1** and **relay 2** via trigger of **input 1** or **WET input**<br>• **input 2** allows delay to run when open but not when closed |
| 29 | deactivation timer | • sequence of **relay 1** and **relay 2** via trigger of **input 1** or **WET input**<br>• **input 2**, once opened after sequence, allows **relay 1** to deactivate<br>• **input 2** allows delay to run when open but not when closed<br>• **input 3** disables sequence, **reverse logic** available |
| 36 | 3-relay sequencer<br>+ '1-shot' | • sequence of **relay 1** and **relay 2** and **relay 3** via trigger of **input 1** or **WET input**<br>• **relay 1**, **relay 2**, and **relay 3** can be maintained or '1-shot' |
| 37 | 3-relay sequence with<br>'independent relay' | • sequence of **relay 1** and **relay 2** and **relay 3** via trigger of **input 1** or **WET input**<br>• **relay 1**, **relay 2**, and **relay 3** can be 'independent' or sequenced |
| 50 | interlock timer | • interlock of **relay 1** and **relay 2** via trigger of **input 1** and **input 2**, respectively |
| 55 | interlock ratchet / latching | • interlock ratchet of **relay 1** and **relay 2** via trigger of **input 1** and **input 2**, respectively |
| 65 | 2-way 2-relay sequence | • sequence of **relay 1** and **relay 2** via trigger of **input 1**<br>• sequence of **relay 2** and **relay 1** via trigger of **input 2**<br>• **input 3** triggers **relay 1** individually, **input 4** triggers **relay 2** individually |
| nL | normally locked restroom | • sequence of **relay 1** (lock), **relay 2** (door), and **relay 3** (occupied indicators) for normally locked, single occupancy restrooms |
| nU | normally unlocked restroom | • sequence of **relay 1** (lock), **relay 2** (door), and **relay 3** (occupied indicators) for normally unlocked, single occupancy restrooms |
| dn | 3-relay sequencer +<br>'day / night (24 hr) mode' | • sequence of **relay 1** and **relay 2** and **relay 3** via trigger of **input 1** or **WET input**<br>• **input 2** operation dependent upon **input 4** ('day / night (24 hr) mode') |
| 00 | disable | • Br3-X disabled |

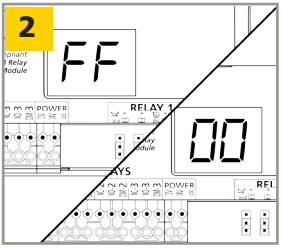
## PARAMETERS

| PARAMETER | DESCRIPTION | LOGIC | |
|---|---|---|---|
| h1 | relay 1 hold time | 00 - 60 seconds<br>count down begins AFTER release of input 1 or WET input | |
| h2 | relay 2 hold time | 00 - 60 seconds<br>count down begins AFTER d1 (delay between relay 1 & relay 2) expires | |
| h3 | relay 3 hold time | 00 - 60 seconds<br>count down begins AFTER d2 (delay between relay 1 & relay 3) expires | |
| d1 | delay between<br>relay 1 & relay 2 | 00 - 60, _1 (1/4), _2 (1/2), _3 (3/4) seconds<br>delay beings AT activation of input 1 or WET input | |
| d2 | delay between<br>relay 1 & relay 3 | 00 - 60, _1 (1/4), _2 (1/2), _3 (3/4) seconds<br>delay beings AT activation of input 1 or WET input | |
| rL | reverse logic | 00 = normal logic<br>input 1 trigger must be NO and close its contact to trigger | 01 = reverse logic<br>input 1 trigger must be NC and open its contact to trigger |
| nP | no parameters | no parameters available for selected function | |

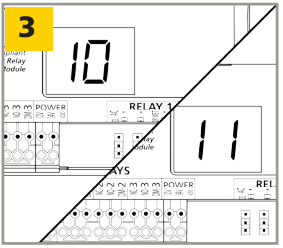
## PROGRAMMING



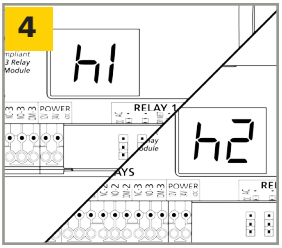

Press and hold INCR + PARAM for 3 seconds.



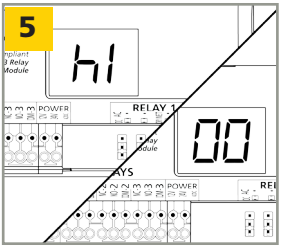

Display will toggle between *FF* and *00* for 5 seconds.



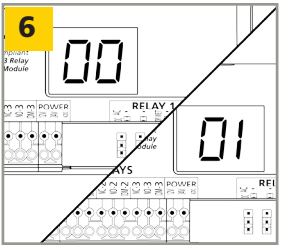

Press INCR to cycle through functions.



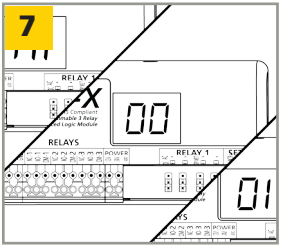

Once desired function is selected, press PARAM to cycle through parameters.



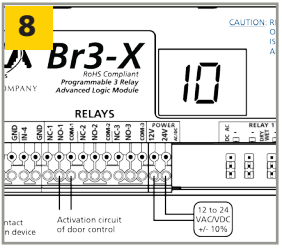

Display will toggle between parameter and its current value for 5 seconds.




Press[3] INCR to cycle through parameter's values.




Repeat steps 4-7 until all function parameters are set.

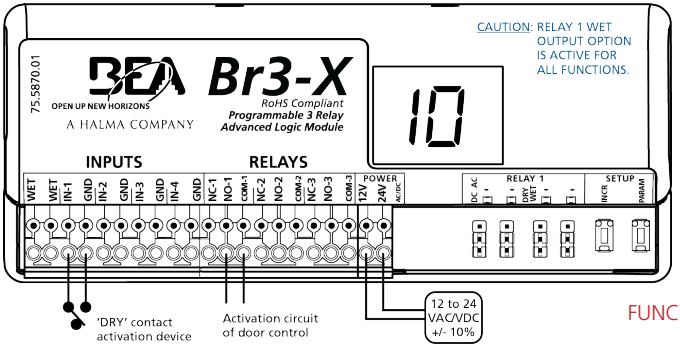



Wait 5 seconds for Br3-X to save and function to display.

**NOTES**:

1. Function *00* disables the Br3-X.
2. *nP* means no parameters are applicable for the selected function.
3. Pressing and holding INCR will rapid cycle.

## 10 - timer




**AVAILABLE PARAMETERS:**

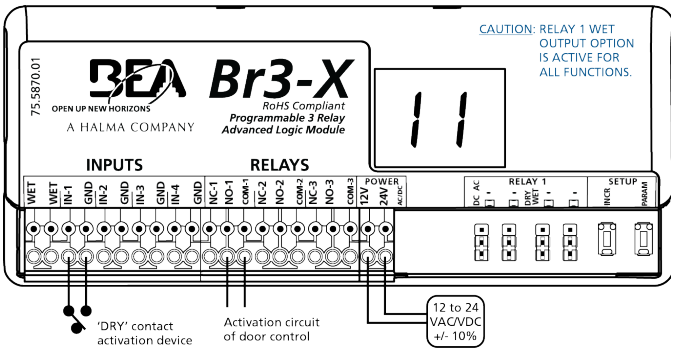
h 1 - relay 1 hold time
rL - reverse logic

See table on page 3 for parameter details.

1. Trigger INPUT 1.
- RELAY 1 will close and hold for time h 1.

FUNCTION 10 NOTE: Reverse logic allows for a Normally Closed (NC) INPUT 1.

## 11 - ratchet / latching



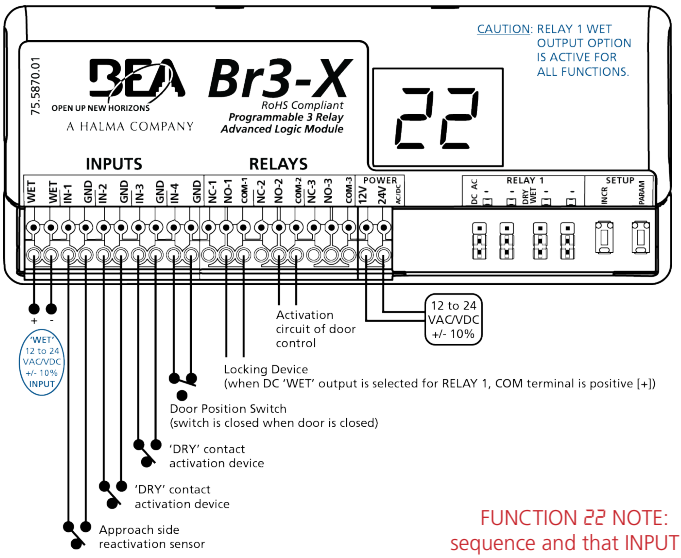

**AVAILABLE PARAMETERS:**

NONE

See table on page 3 for parameter details.

1. Trigger INPUT 1.
- RELAY 1 will close and hold indefinitely.
2. Trigger INPUT 1.
- RELAY 1 will open.

## 22 - 2-relay sequencer + inhibitor




**AVAILABLE PARAMETERS:**

h 1 - relay 1 hold time
h2 - relay 2 hold time
d 1 - delay between relays 1 & 2

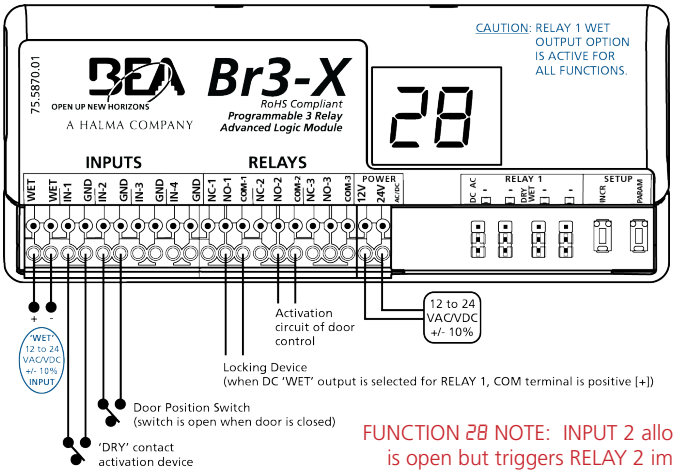
See table on page 3 for parameter details.

h 1 must be greater than d 1 when using an electric lock

1. Trigger INPUT 2, 3, or 'WET'.
- RELAY 1 will close and hold for time h 1.
- RELAY 2 will close after time delay d 1 and hold for time h2.

FUNCTION 22 NOTE: Ensure INPUT 1 does not initiate the sequence and that INPUT 4 is closed when the door is closed.

## 28 - 2-relay sequencer + door position




**AVAILABLE PARAMETERS:**

H 1 - relay 1 hold time
H2 - relay 2 hold time
d 1 - delay between relays 1 & 2

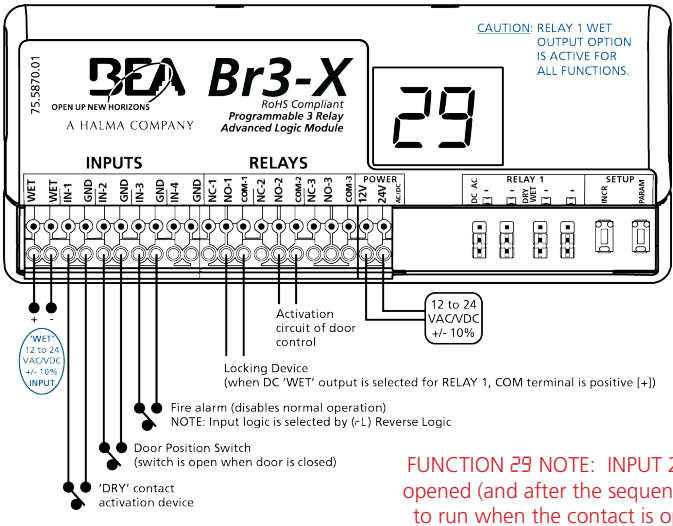
See table on page 3 for parameter details.

H 1 must be greater than d 1 when using an electric lock

1. Trigger INPUT 1 or 'WET'.
- RELAY 1 will close and hold for time H 1.
- RELAY 2 will close after time delay d 1 and hold for time H2.

FUNCTION 28 NOTE: INPUT 2 allows the delay to run when the contact is open but triggers RELAY 2 immediately when the contact is closed.

## 29 - deactivation timer




**AVAILABLE PARAMETERS:**

H 1 - relay 1 hold time
H2 - relay 2 hold time
d 1 - delay between relays 1 & 2
rL - reverse logic

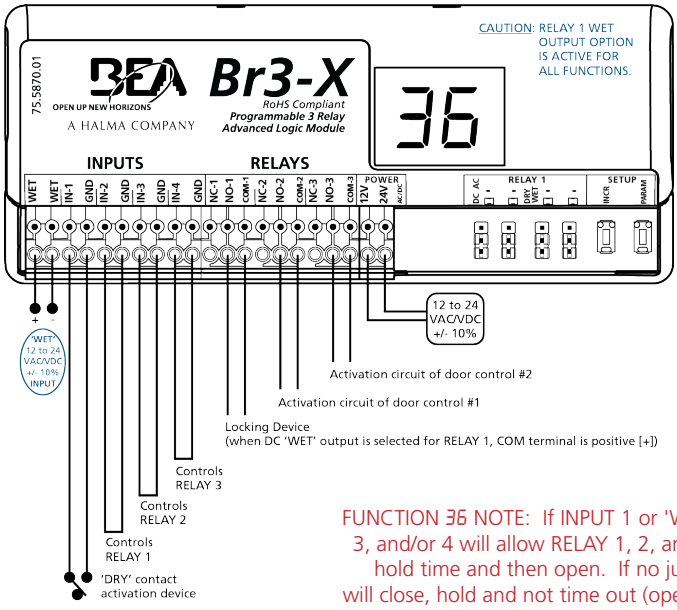
See table on page 3 for parameter details.

H 1 must be greater than d 1 when using an electric lock

1. Trigger INPUT 1 or 'WET'.
- RELAY 1 will close and hold for time H 1.
- RELAY 2 will close after time delay d 1 and hold for time H2.

FUNCTION 29 NOTE: INPUT 2 deactivates RELAY 1 once INPUT 2 is opened (and after the sequence has run). INPUT 2 allows the delay to run when the contact is open but triggers RELAY 2 immediately when the contact is closed. INPUT 3 disables the sequence.

## 36 - 3-relay sequencer + '1-shot'




**AVAILABLE PARAMETERS:**

h1 - relay 1 hold time
h2 - relay 2 hold time
h3 - relay 3 hold time
d1 - delay between relays 1 & 2
d2 - delay between relays 1 & 3

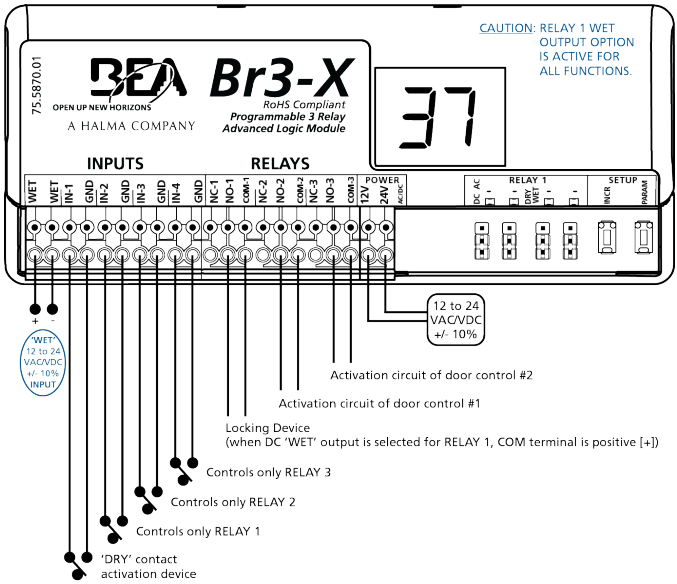
See table on page 3 for parameter details.

h1 must be greater than d1 when using an electric lock

1. Trigger INPUT 1 or 'WET'.
- RELAY 1 will close and hold for time h1.
- RELAY 2 will close after time delay d1 and hold for time h2.
- RELAY 3 will close after time delay d2 and hold for time h3.

FUNCTION 36 NOTE: If INPUT 1 or 'WET' is maintained, jumping INPUT 2, 3, and/or 4 will allow RELAY 1, 2, and/or 3 (respectively) to close, run the hold time and then open. If no jumpers are set, RELAYS 1, 2, and/or 3 will close, hold and not time out (open) until INPUT 1 or 'WET' is released.

## 37 - 3-relay sequence with 'independent relay'




**AVAILABLE PARAMETERS:**

h1 - relay 1 hold time
h2 - relay 2 hold time
h3 - relay 3 hold time
d1 - delay between relays 1 & 2
d2 - delay between relays 1 & 3

See table on page 3 for parameter details.

h1 must be greater than d1 when using an electric lock

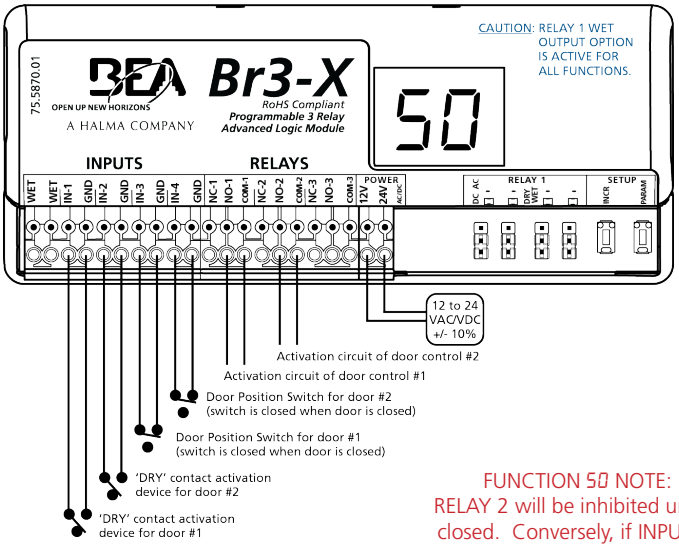
1. Trigger INPUT 1 or 'WET'.
- RELAY 1 will close and hold for time h1.
- RELAY 2 will close after time delay d1 and hold for time h2.
- RELAY 3 will close after time delay d2 and hold for time h3.

1. Trigger INPUT 2.
- RELAY 1 will close and hold for time h1.

1. Trigger INPUT 3.
- RELAY 2 will close and hold for time h2.

1. Trigger INPUT 4.
- RELAY 3 will close and hold for time h3.

## 50 - interlock timer




**AVAILABLE PARAMETERS:**

h1 - relay 1 hold time
h2 - relay 2 hold time

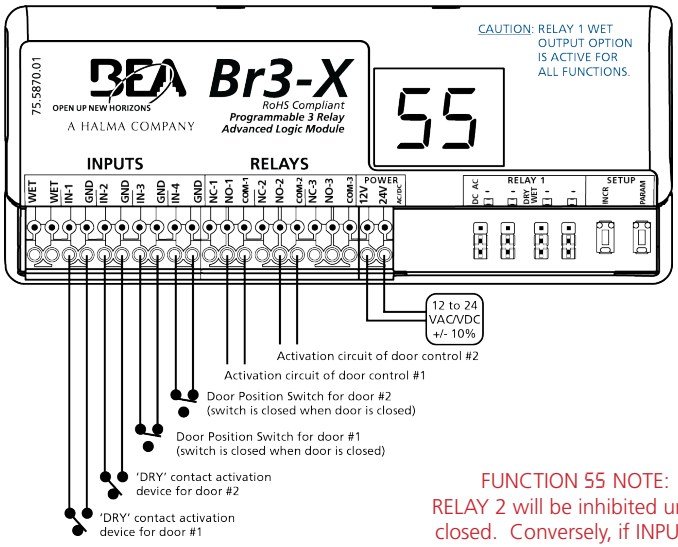
See table on page 3 for parameter details.

1. Trigger INPUT 1.
- RELAY 1 will close and hold for time h1.

1. Trigger INPUT 2.
- RELAY 2 will close and hold for time h2.

FUNCTION 50 NOTE: If INPUT 1 is triggered, INPUT 2 and RELAY 2 will be inhibited until INPUT 3 (door position switch) is closed. Conversely, if INPUT 2 is triggered, INPUT 1 and RELAY 1 will be inhibited until INPUT 4 (door position switch) is closed.

## 55 - interlock ratchet / latching




**AVAILABLE PARAMETERS:**

NONE

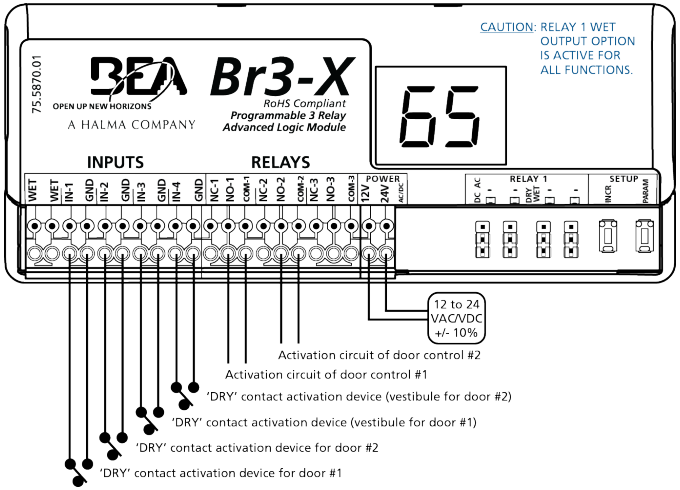
See table on page 3 for parameter details.

1. Trigger INPUT 1.
- RELAY 1 will close and hold until indefinitely.
2. Trigger INPUT 1.
- RELAY 1 will open.

1. Trigger INPUT 2.
- RELAY 2 will close and hold indefinitely.
2. Trigger INPUT 2.
- RELAY 2 open.

FUNCTION 55 NOTE: If INPUT 1 is triggered, INPUT 2 and RELAY 2 will be inhibited until INPUT 3 (door position switch) is closed. Conversely, if INPUT 2 is triggered, INPUT 1 and RELAY 1 will be inhibited until INPUT 4 (door position switch) is closed.

## 65 - 2-way 2-relay sequence




**AVAILABLE PARAMETERS:**

h1 - relay 1 hold time
h2 - relay 2 hold time
d1 - delay between relays 1 & 2
d2 - delay between relays 2 & 1

See table on page 3 for parameter details.

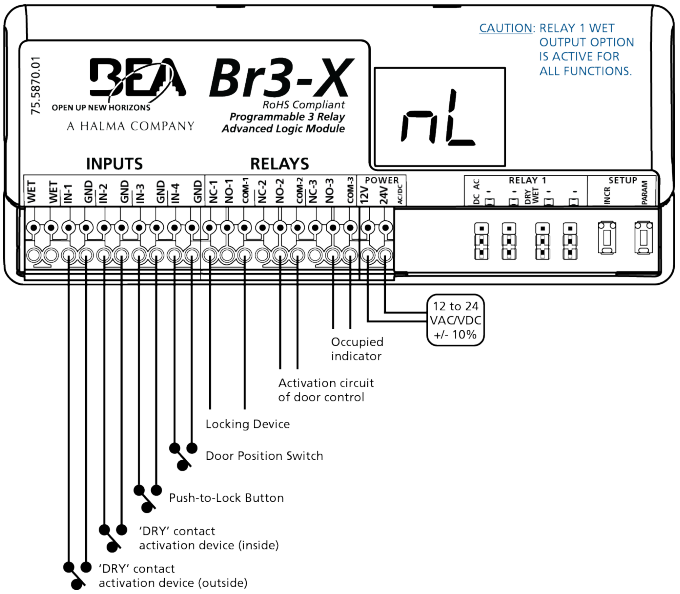
1. Trigger INPUT 1.
- RELAY 1 will close and hold for time h1.
- RELAY 2 will close after time delay d1 and hold for time h2.

1. Trigger INPUT 2.
- RELAY 2 will close and hold for time h2.
- RELAY 1 will close after time delay d2 and hold for time h1.

1. Trigger INPUT 3.
- RELAY 1 will close and hold for time h1.

1. Trigger INPUT 4.
- RELAY 2 will close and hold for time h2.

## nL - normally locked restroom




**AVAILABLE PARAMETERS:**

h1 - relay 1 hold time
h2 - relay 2 hold time
d1 - delay between relays 1 & 2

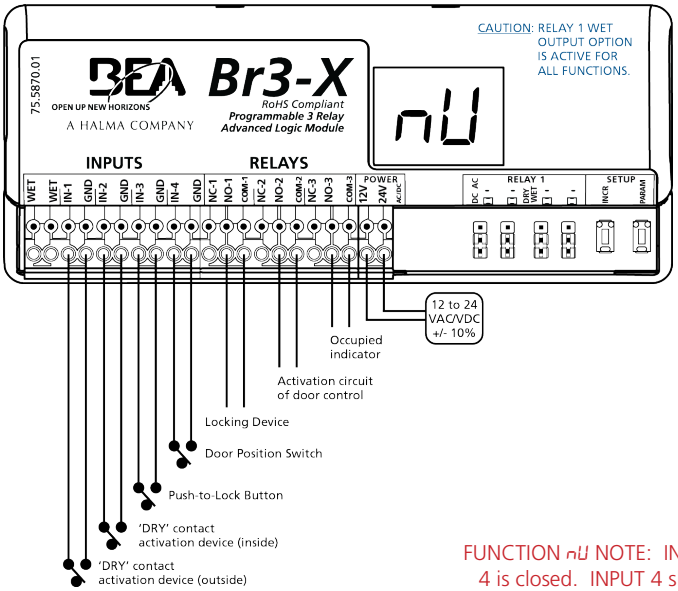
See table on page 3 for parameter details.

h1 must be greater than d1

1. Trigger INPUT 1.
- RELAY 1 will close and hold for time h1.
- RELAY 2 will close after time delay d1 and hold for time h2.
2. Trigger INPUT 3.
- RELAY 3 will close and INPUT 1 will be inhibited.
3. Trigger INPUT 2.
- RELAY 1 will close and hold for time h1.
- RELAY 2 will close after time delay d1 and hold for time h2.
- RELAY 3 will open.

FUNCTION nL NOTE: INPUT 3 will not function unless INPUT 4 is closed. INPUT 4 should be closed when door is closed.

## nU - normally unlocked restroom




**AVAILABLE PARAMETERS:**

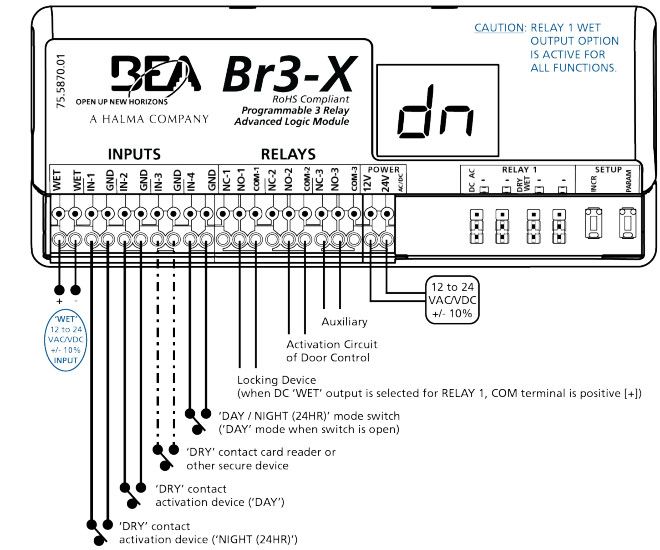
h2 - relay 2 hold time
d1 - delay between relays 1 & 2

See table on page 3 for parameter details.

1. Trigger INPUT 1.
- RELAY 2 will close and hold for time h2.
2. Trigger INPUT 3.
- RELAY 1 and 3 will close and INPUT 1 will be inhibited.
3. Trigger INPUT 2.
- RELAY 1 will open.
- RELAY 2 will close after time delay d1 and hold for time h2.
- RELAY 3 will open.

FUNCTION nU NOTE: INPUT 3 will not function unless INPUT 4 is closed. INPUT 4 should be closed when door is closed.

## dn - 3-relay sequence with 'day / night (24 hr) mode'




**AVAILABLE PARAMETERS:**

h1 - relay 1 hold time
h2 - relay 2 hold time
h3 - relay 3 hold time
d1 - delay between relays 1 & 2
d2 - delay between relays 1 & 3

See table on page 3 for parameter details.

1. Trigger INPUT 1, INPUT 2, or 'WET'.
- RELAY 1 will close and hold for time h1.
- RELAY 2 will close after time delay d1 and hold for time h2.
- RELAY 3 will close after time delay d2 and hold for time h2.

1. Trigger INPUT 3.
- RELAY 1 will close and hold for time h1.
- INPUT 2 will be uninhibited for 5 seconds.

FUNCTION dn NOTE: INPUT 2 will only function if INPUT 4 is open.

## TEST

Upon completion of jumper settings, wiring, and programming, test the Br3-X to ensure all function parameters are working correctly and as intended for the specific application.

## RELAY STATUS

| STATUS | DESCRIPTION |
|---|---|
| r 1 | relay 1 closed when wired NO or open when wired NC |
| r2 | relay 2 closed when wired NO or open when wired NC |
| r3 | relay 3 closed when wired NO or open when wired NC |
| r= | relay 1 and relay 2 closed when wired NO or open when wired NC |
| r- | relay 1 and relay 3 closed when wired NO or open when wired NC |
| r≡ | relay 1, relay 2, and relay 3 closed when wired NO or open when wired NC |

## FUNCTION CROSS REFERENCE

| BR3 FUNCTION | BR3-X FUNCTION |
|---|---|
| 21 | 22 |
| 25 | 36 or 37 |
| 35 | 36 or 37 |
| 75 | 36 or 37 |

## TROUBLESHOOTING

| | | |
|---|---|---|
| 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 | 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 | 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 |
| E 1, E2, E3, E4, E5 | EEPROM error | Reset Br3-X and reprogram |

## TECHNICAL SPECIFICATIONS

| | |
|---|---|
| Supply Voltage | 12-24 VAC/VDC +/- 10% |
| Current Consumption | 30-130 mA (DRY output) |
| Temperature Rating | -15° to 150° F (-26° to 150° C)<br>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 | DRY contact |
| WET input | 5-24 VAC/VDC +/-10% |
| Contact Rating | |
| Relay 1 (DRY) | 3 A @ 24 VAC or 30 VDC |
| Relay 1 (WET) | 1 A |
| Relay 2 | 3 A @ 24 VAC or 30 VDC |
| Relay 3 | 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 |

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









### ANSI / AAADM Compliance

Upon completion of the installation or service work, at a minimum, perform a daily safety check in accordance with the minimum inspection guidelines provided by AAADM. Provide each equipment owner with an owner's manual that includes a daily safety checklist and contains, at a minimum, the information recommended by AAADM. Offer an information session with the equipment owner explaining how to perform daily inspections and point out the location of power/operation switches to disable the equipment if a compliance issue is noted. The equipment should be inspected annually in accordance with the minimum inspection guidelines. A safety check that includes, at a minimum, the items listed on the safety information label must be performed during each service call. If you are not an AAADM certified inspector, BEA strongly recommends you have an AAADM certified inspector perform an AAADM inspection and place a valid inspection sticker below the safety information label prior to putting the equipment into operation.