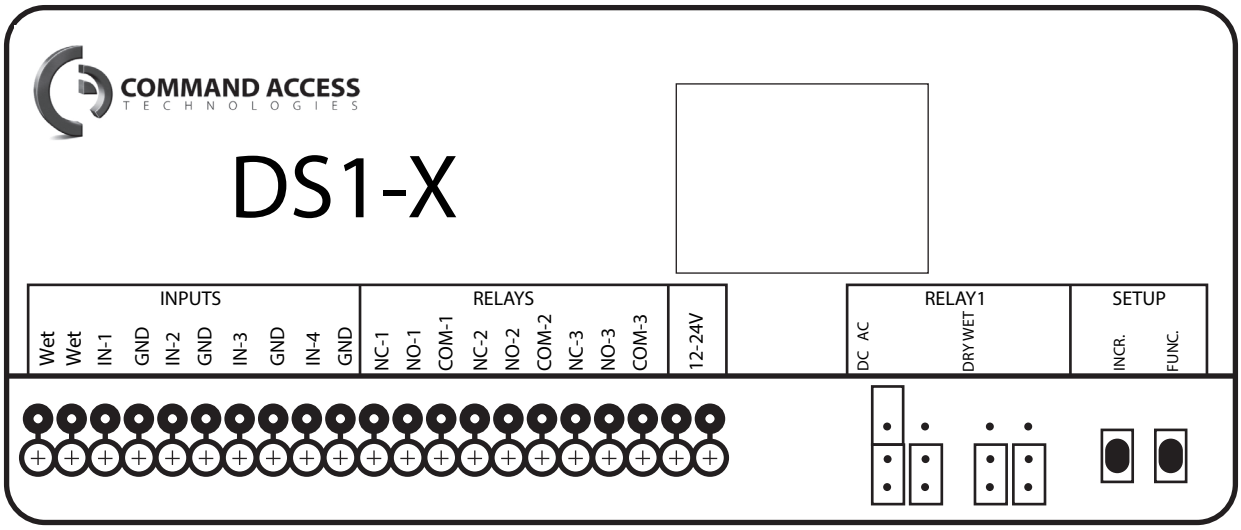
DS1-X

INSERT INSTRUCTIONS

The Command Access DS1-X is a mulit-function Door Sequencing Relay Board



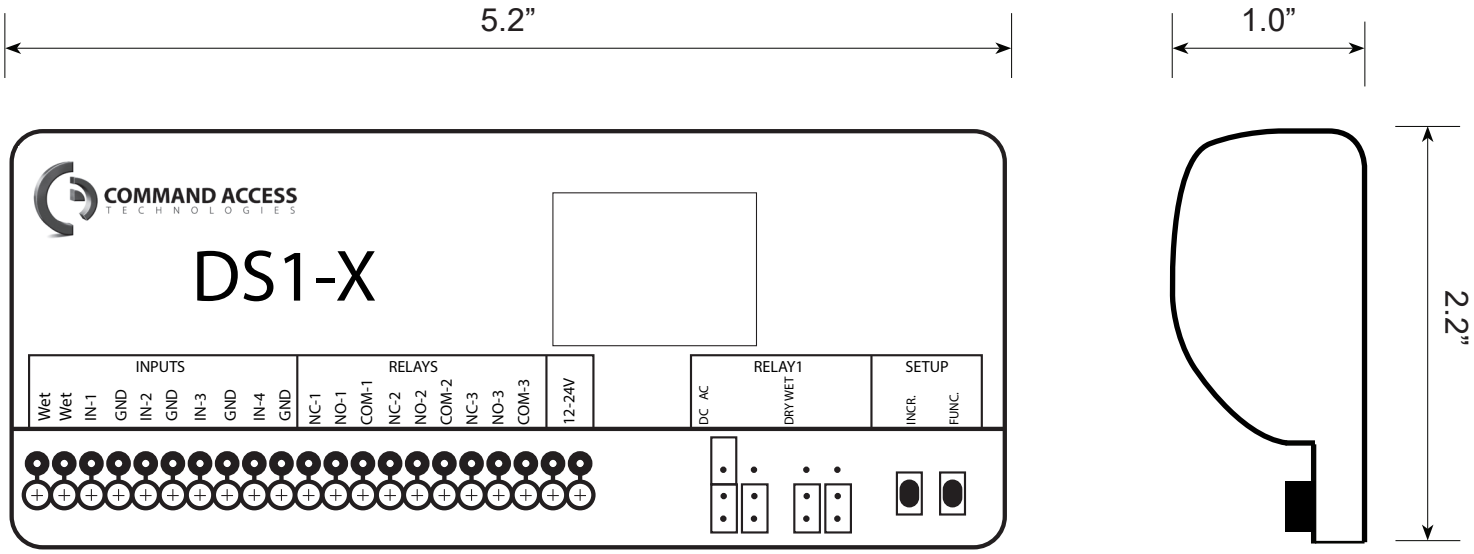
INCLUDED IN KIT

DS1-X

FEATURES

- Versatility with 13 programmable logic functions
- Two-button programming combined with dual seven-segment display provides simple setup.
- Two 3-AMP relays and one 1-AMP relay, all with built-in surge suppresion, eliminates the need for external components with installing some electric locking devices.
- Wet output with AC/DC voltage for powering an electric locking device directly from the module.

DIMENSIONS AND SPECIFICATIONS



SPECIFICATIONS

- **Supply Voltage:** 12 - 24 VAC / VDC +/-10%
- **Power Consumption:** 30 - 130 mA; DRY output
- **Relay Hold Time:** up to 60 seconds per relay
- **Delay Between Relays:** up to 60 seconds per relay with 1/4, 1/2 and 3/4 second options
- **Input Specification:**
  - **Inputs 1, 2, 3, 4** DRY contact
  - **WET Input** 5 - 24 VAC / VDC +/-10%
- **Contact Rating:**
  - **Relay 1 (DRY)** 3A @ 24 VAC / 30 VDC
  - **Relay 1 (WET)** 1A
  - **Relay 2** 3A @ 24 VAC / 30 VDC
  - **Relay 3** 1A @ 24 VAC / 30 VDC

PRECAUTIONS

- ❑ 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 Command Access:
  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.

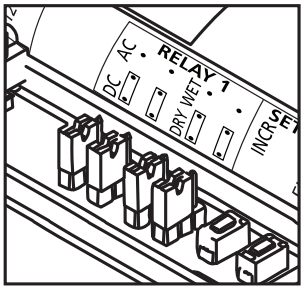
JUMPERS

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 DS1-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 DS1-X and possibly the load will be permanently damaged.
- ❑ When using the 'WET' output option on the DS1-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 DS1-X, the output will correspond. The following can also be observed:
  1. If voltage Input at the DS1-X is AC, then output selection can be AC or DC.
  2. If voltage Input at the DS1-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 DS1-X, the 'WET' output is only available at Relay 1.
- ❑ When supplying DS1-X with AC input voltage and selecting Relay 1 output for 'WET' and DC OUTPUT VOLTAGE, note that the resulting DC output will be the rectified AC input voltage and therefore, about 40% higher than the AC input voltage (rms).

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 DS1-X to supply a voltage output of up to 1 A on relay 1 for powering maglocks or electric strikes directly from the DS1-X. Rating of power supply which powers the DS1-Xmust be at least 1 A.
2. Default jumper settings make relay 1 DRY.
3. AC voltage only available if DS1-X is powered by AC voltage.
4. DC voltage available if DS1X is powered by AC or DC voltage.

WIRING

Each DS1-X function is wired differently. Please review and follow the appropriate wiring diagram shown for each function.

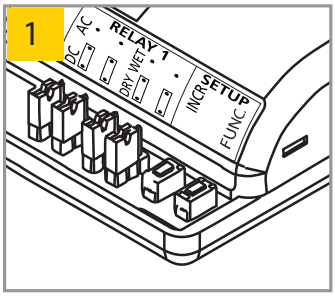
FUNCTIONS

FUNCTION	DESCRIPTION	LOGIC
10	timer	• activation of relay 1 via trigger of input 1 • reverse logic available
11	ratchet / latching	• ratchet/latching of relay 1 via trigger of input 1
22	2-relay sequencer + inhibitor	• sequence of relay 1 and relay 2 with inhibiting of input 1 until input 2 , input 3 , or WET input is triggered • activation of input 4 reinhibits input 1
28	2-relay sequencer + door position	• sequence of relay 1 and relay 2 via trigger of input 1 or WET input • 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 • input 2 , once opened after sequence, allows relay 1 to deactivate • input 2 allows delay to run when open but not when closed • input 3 disables sequence, reverse logic available
36	3-relay sequencer + '1-shot'	• sequence of relay 1 and relay 2 and relay 3 via trigger of input 1 or WET input • relay 1 , relay 2 , and relay 3 can be maintained or '1-shot'
37	3-relay sequence with 'independent relay'	• sequence of relay 1 and relay 2 and relay 3 via trigger of input 1 or WET input • 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 • sequence of relay 2 and relay 1 via trigger of input 2 • 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 + 'day / night mode'	• sequence of relay 1 and relay 2 and relay 3 via trigger of input 1 or WET input • input 2 operation dependent upon input 4 ('day / night mode')
00	disable	• DS1-X disabled • 00 is the default setting and has no assigned function

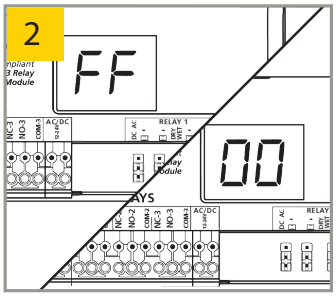
PARAMETERS

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

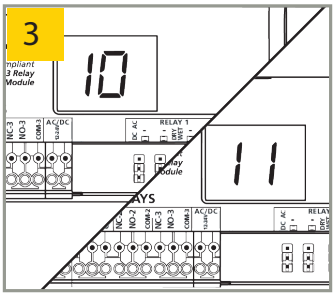
PROGRAMMING



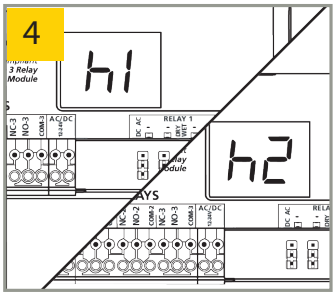
Press and hold INCR + FUNC for 3 seconds.



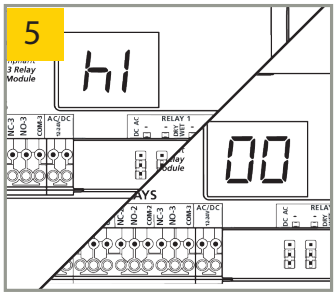
Display will toggle between FF and 00 for 5 seconds. [1,2]



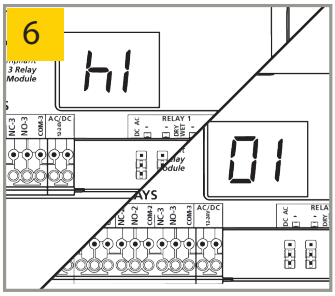
While FF / 00 is displayed, press INCR to cycle through functions.



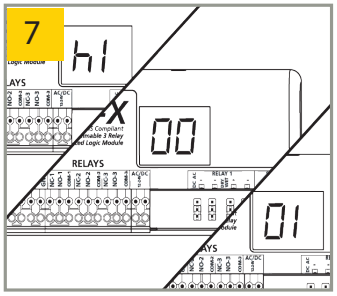
Once desired function is selected, press FUNC to cycle through parameters.



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 DS1-X to save and display function.

Relay hold time(s) and delay time(s) MUST be set for any relay that is to be utilized.

Ex: For function 36, if using only relay 1, h1 must be set...if using relay 1 and relay 2, h1, h2, and d1 must be set.

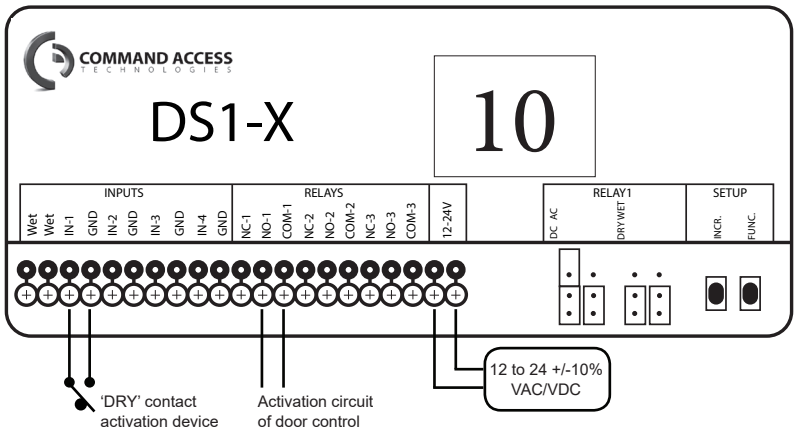
NOTES :

1. Function 00 disables the DS1-X.
2. " nP" means no parameters are applicable for the selected function.
3. Pressing and holding INCR will rapid cycle.

PROGRAMMING PARAMETERS

* see page 3 for specific parameter details *

10 – timer



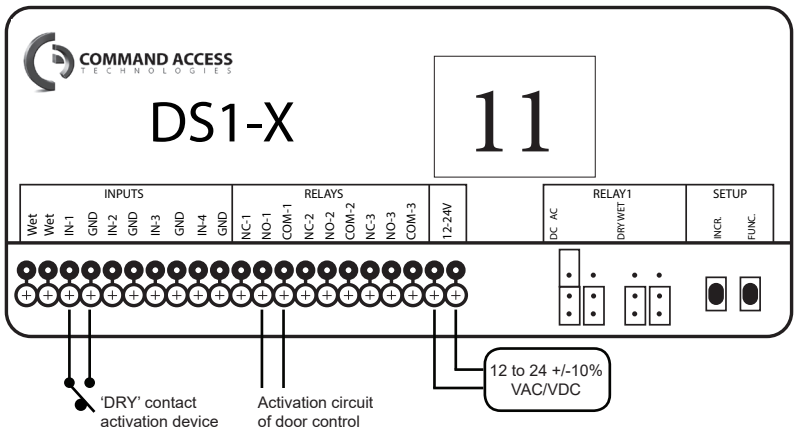
AVAILABLE PARAMETERS:

h1 - relay 1 hold time
rL - reverse logic

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

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

11 – ratchet / latching

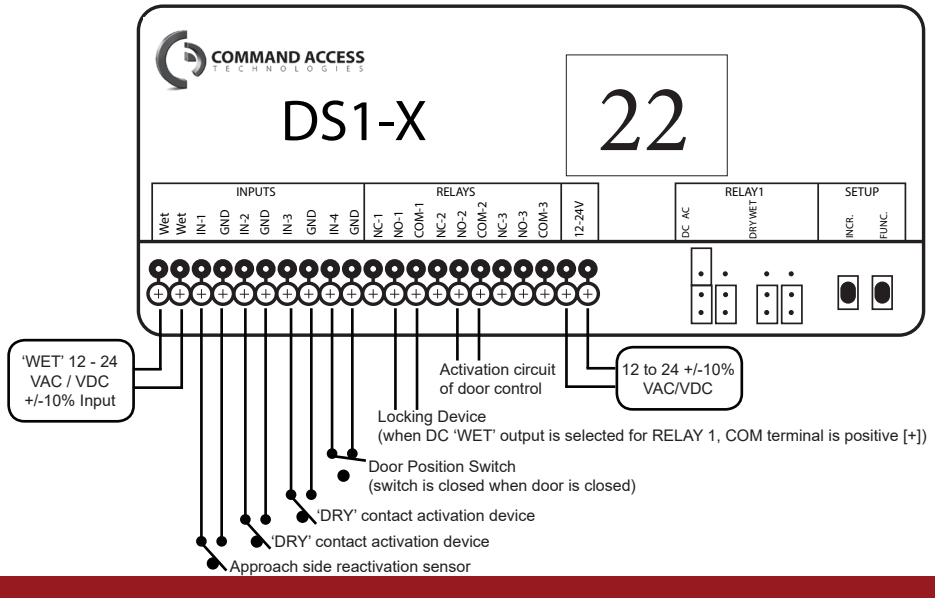


AVAILABLE PARAMETERS:

NONE

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:

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

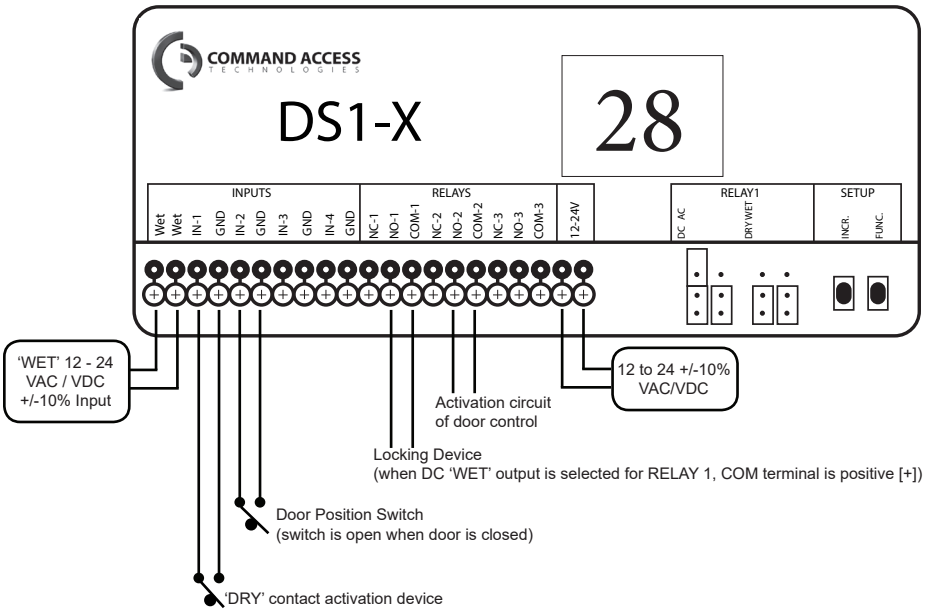
h1 must be greater than d1 when using an electric lock

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

PROGRAMMING PARAMETERS (cont)

28 – 2-relay sequencer + door position



AVAILABLE PARAMETERS:

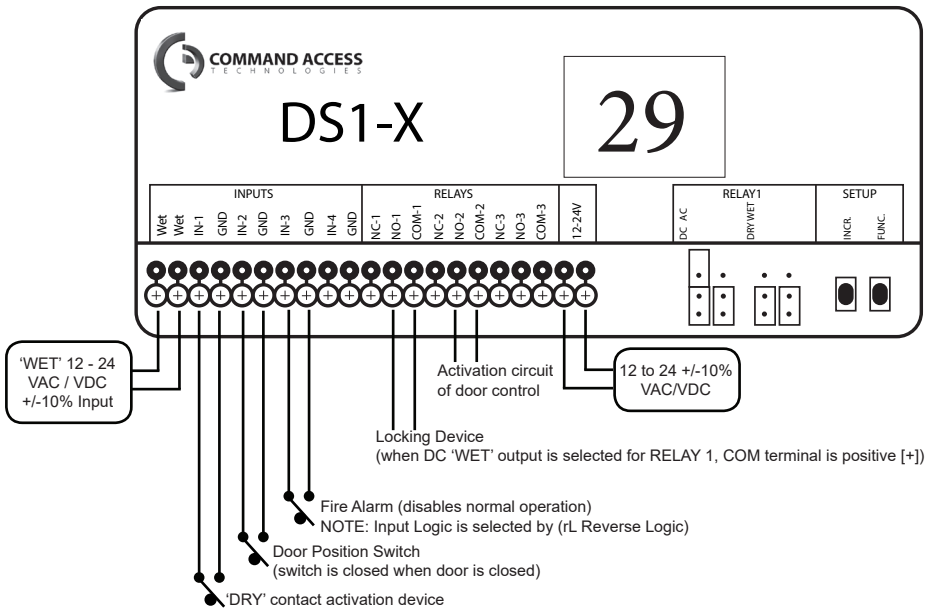
h1 - relay 1 hold time
h2 - relay 2 hold time
d1 - delay between relays 1 & 2

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.

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:

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

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.

FUNCTION 29 NOTE:

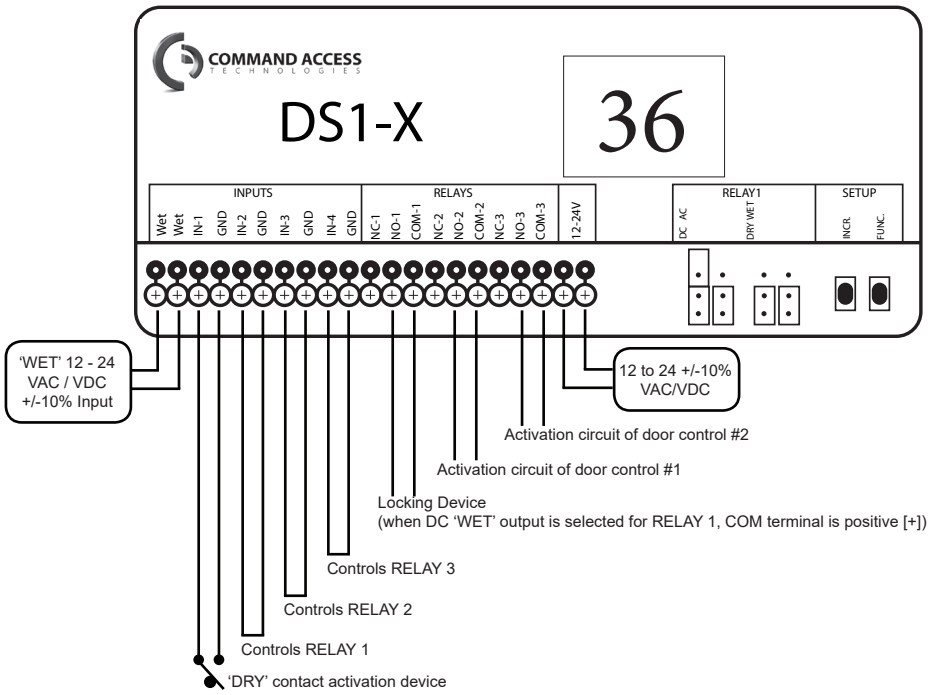
INPUT 2 deactivates RELAY 1 once INPUT 2 is opened (and after the sequence has run).

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.

PROGRAMMING PARAMETERS (cont)

36 – 3-relay sequencer + '1-shot'



AVAILABLE PARAMETERS:

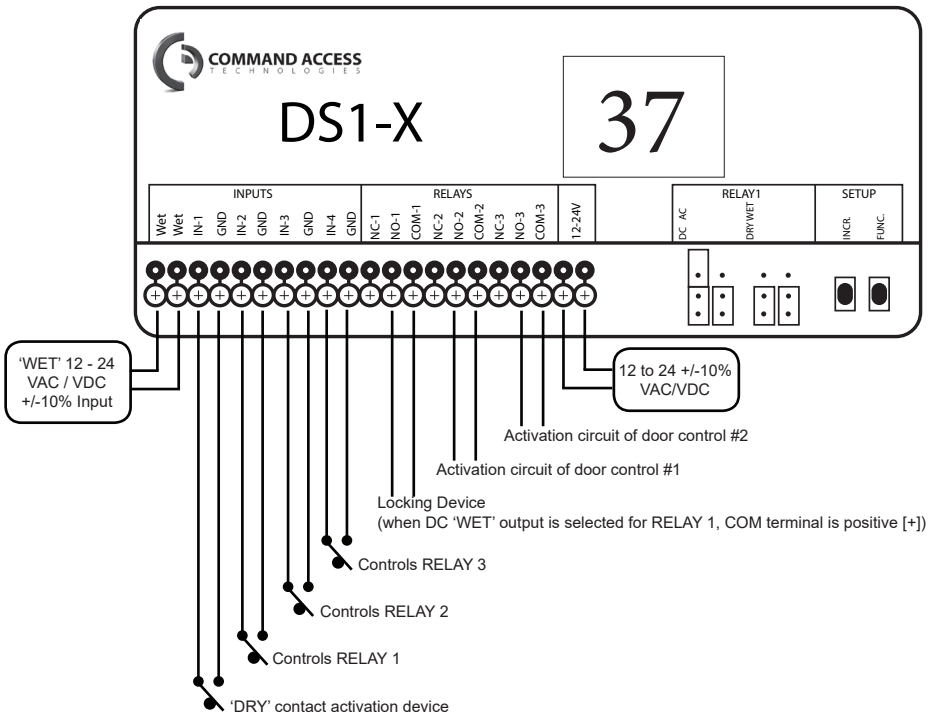
h1 - relay 1 hold time
h2 - relay 2 hold time
h3 - relay 3 hold time
d1 - delay between relays 1 & 2
d2 - delay between relays 1 & 3

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, i.e. 1-shot) until INPUT 1 or 'WET' is released.

37 – 3-relay sequence with 'independent relay'



AVAILABLE PARAMETERS:

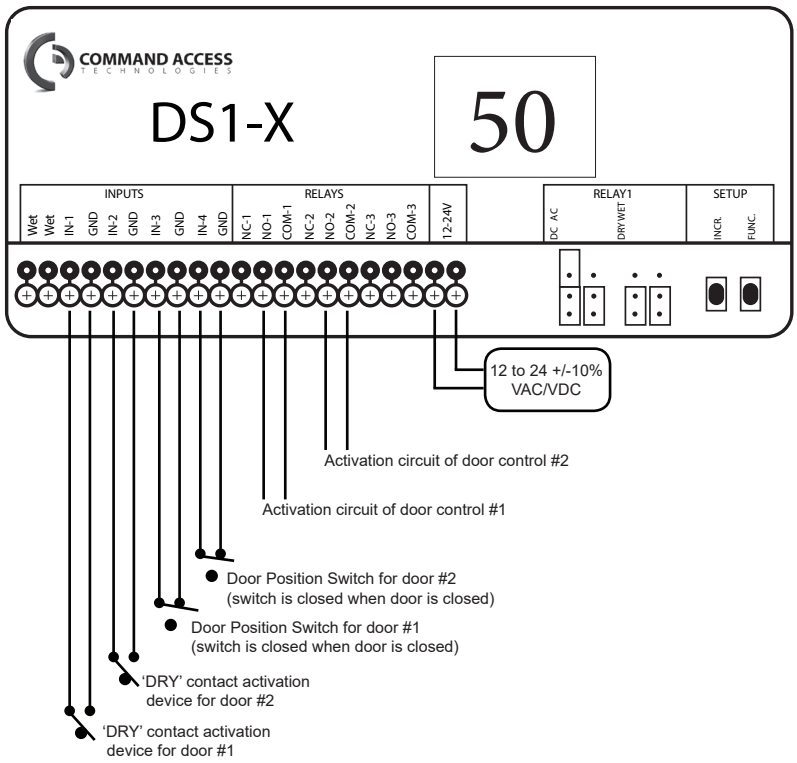
h1 - relay 1 hold time
h2 - relay 2 hold time
h3 - relay 3 hold time
d1 - delay between relays 1 & 2
d2 - delay between relays 1 & 3

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.
2. Trigger INPUT 2.
   - RELAY 1 will close and hold for time h1.
3. Trigger INPUT 3.
   - RELAY 2 will close and hold for time h2.
4. Trigger INPUT 4.
   - RELAY 3 will close and hold for time h3.

PROGRAMMING PARAMETERS (cont)

50 – interlock timer



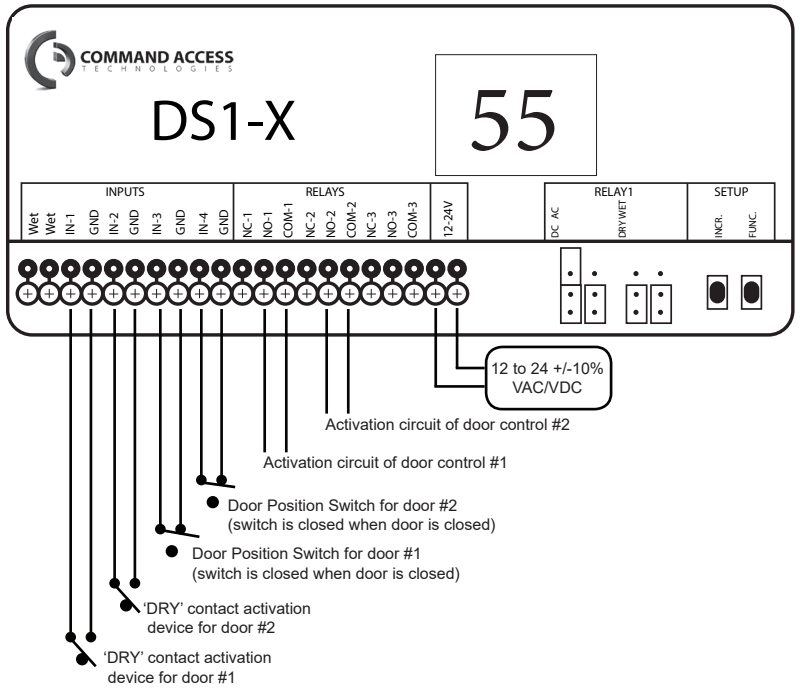
AVAILABLE PARAMETERS:

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

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

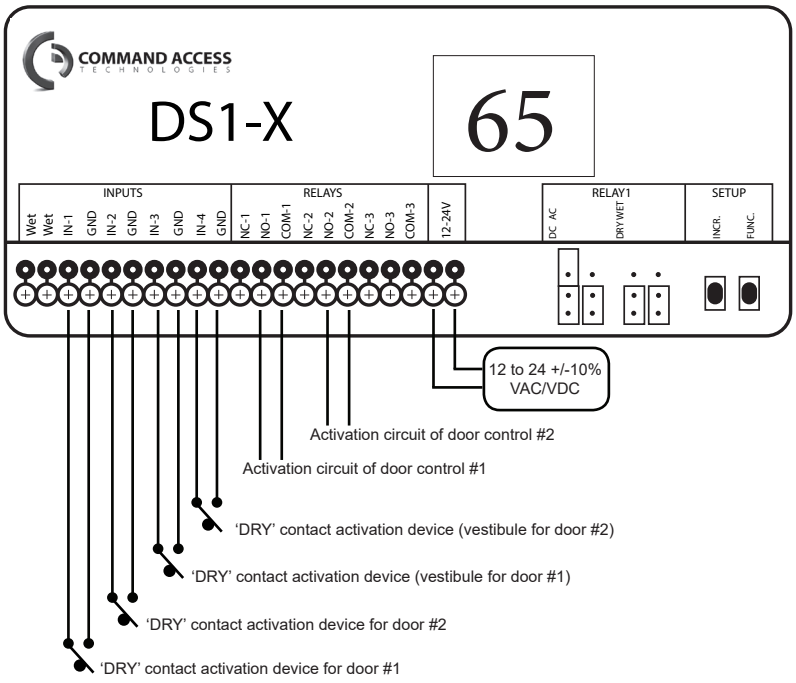
NONE

1. Trigger INPUT 1.
   - RELAY 1 will close and hold until indefinitely.
2. Trigger INPUT 1.
   - RELAY 1 will open.
3. Trigger INPUT 2.
   - RELAY 2 will close and hold indefinitely.
4. 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.

PROGRAMMING PARAMETERS (cont)

65 – 2-way 2-relay sequence

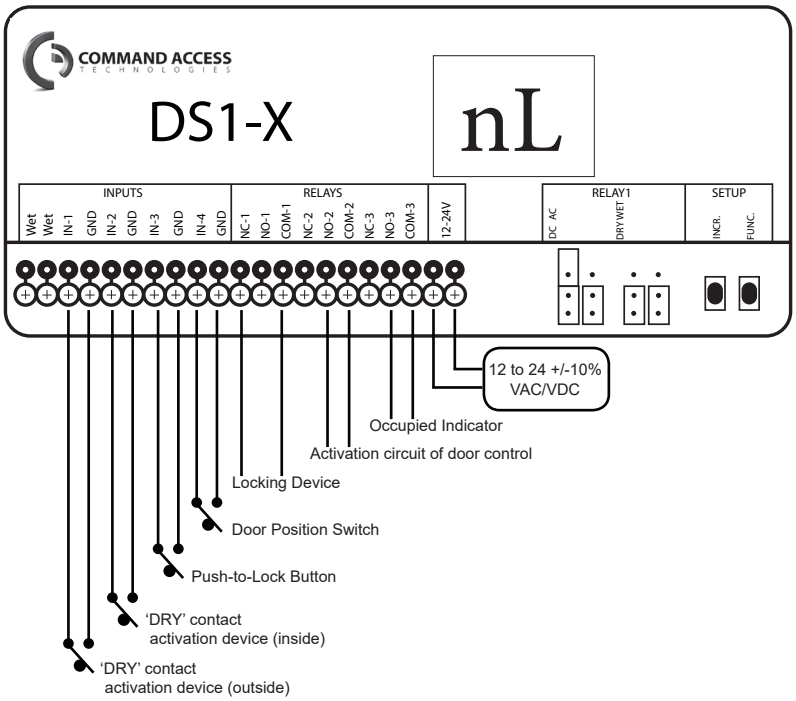


AVAILABLE PARAMETERS:

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

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 2.
   - RELAY 2 will close and hold for time h2.
   - RELAY 1 will close after time delay d2 and hold for time h1.
3. Trigger INPUT 3.
   - RELAY 1 will close and hold for time h1.
4. 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

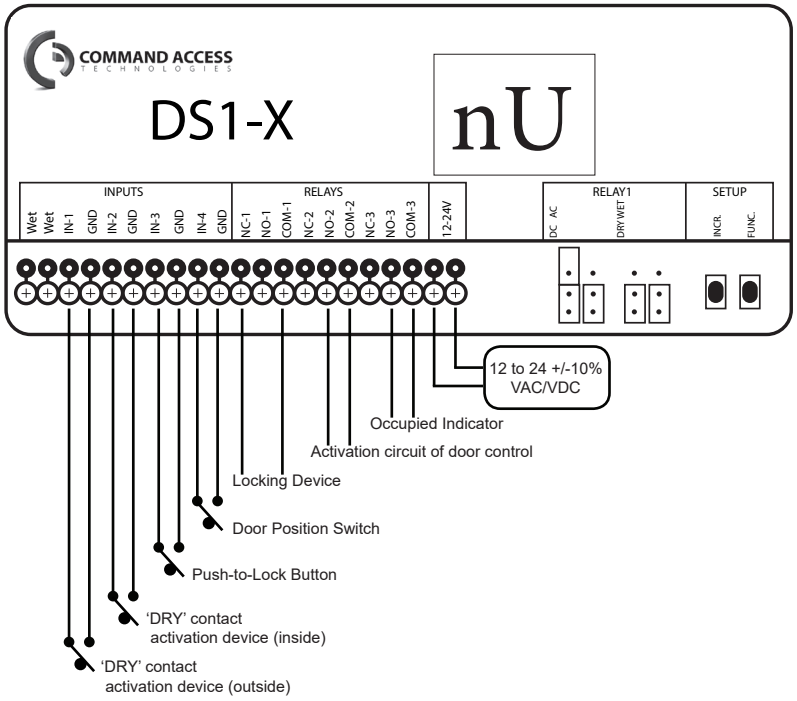
h1 must be greater than d1

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.

PROGRAMMING PARAMETERS (cont)

nU – normally unlocked restroom



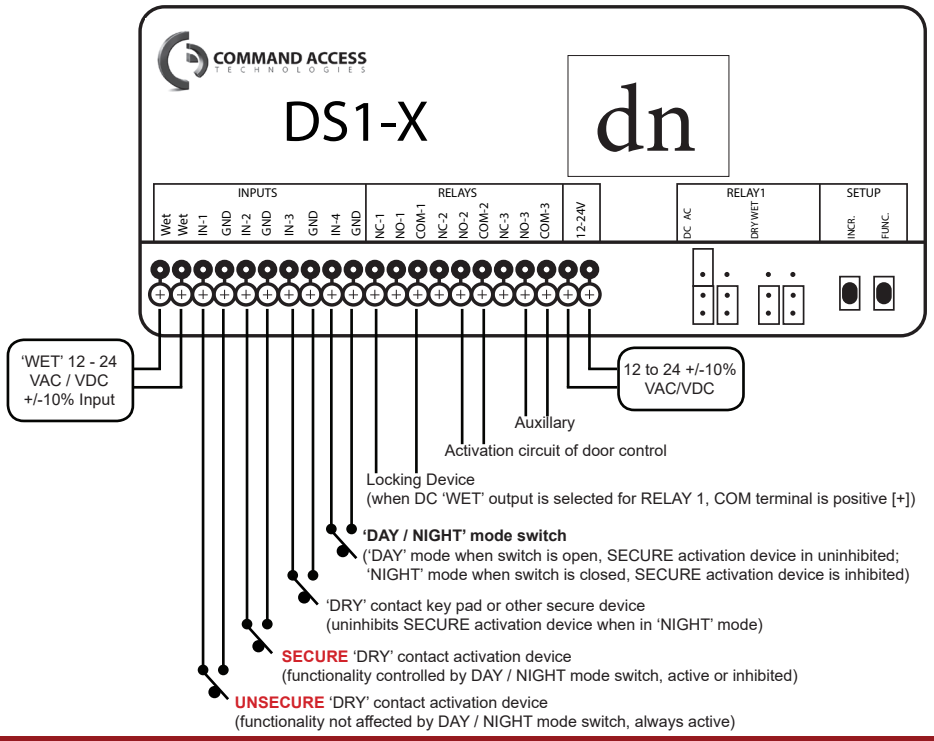
AVAILABLE PARAMETERS:

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

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 nUNOTE: 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 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

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 h3.
2. 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 DS1-X to ensure all function parameters are working correctly and as intended for the specific application.

RELAY STATUS

STATUS	DESCRIPTION
r1	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

DS1 FUNCTION	DS1-X FUNCTION
21	22
25	28, 29 , 36 , or 37
35	36 or 37
75	28, 29 , 36 , or 37

TROUBLESHOOTING

DS1-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, DS1-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 DS1-X	Replace DS1-X
DS1-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, DS1-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 DS1-X	Replace DS1-X
DS1-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 DS1-X and reprogram