

# SYNAPSE



## **INSTALL GUIDE** CONTROL CONTACT

**Part Number:** CONTROL-CNTC-101

## DESCRIPTION

The Control-Contact provides wireless control of 120 VAC and 24VAC/VDC circuits via an on-board relay.

## SPECIFICATIONS

**Input power:** 120VAC or 24VAC +/-10%, 50/60Hz or 24VDC +/- 10%; 3W maximum.

**Dimensions:** 7.1" L x 5.1" W x 4.8" H (180mm x 129mm x 122mm)

**Environment:** -40C to +70C, 10 to 95% RH, non-condensing

**Load Power:** 120VAC or 24VAC +/-10%, 50/60Hz or 24VDC +/- 10%

**Load Rating:** 120VAC, 13A Resistive

120VAC, 1/3HP Motor

120VAC, 1A Pilot Duty

Maximum continuous load 13A AC or DC

**Surge Rating:** 4KV @ 120VAC; 0.5KV @ 24VAC/VDC

**Mounting:** Wall or I-Beam (mounting brackets included)

**Radio:** 2.4 GHz (IEEE 802.15.4), +20 dBm Transmit Power, -103 Receive Sensitivity

**Relay:** TE part number K10P-11D15-24 (replace at your own risk)

**Certifications:** c(UL)us, FCC/IC, RoHS

**Warranty:** 1 Year

See [www.synapsewireless.com/warranty](http://www.synapsewireless.com/warranty) for warranty terms.

## WARNINGS AND CAUTIONS

- TO AVOID FIRE, SHOCK, OR DEATH; TURN OFF POWER AT CIRCUIT BREAKER OR FUSE AND TEST THAT POWER IS OFF BEFORE WIRING!
- Risk of Electric Shock - More than one disconnect switch may be required to de-energize the equipment before servicing.
- The Control-Contact must be installed in accordance with national, state, and local electrical codes and requirements.
- All work must be performed by qualified personnel.
- Use this device with copper or copper clad wire only rated 300V, 105C minimum.
- If you are unsure about any part of these instructions, consult an electrician.

**For Support-** Please contact your commissioning agent or installer, or open a support ticket at-

<https://support.synapsewireless.com/>

## INCLUDED MATERIAL

- **Wetting Capacitor:** For light dc loads of < 0.3a ,e.g. dry contact applications, the supplied wetting capacitor must be connected across the relay terminals to avoid possible malfunction due to oxidation of the contacts. See page 5 for details.

## NEEDED MATERIAL

- **Screwdriver:** A #2 Phillips is required to remove the cover and connect the cables to the terminals.
- **Mounting:** Mounting brackets are included. Mounting hole fits #10 screw
- **Conduit:** To maintain the IP rating of the unit, it must be installed with the PG16 cable gland with embedded o-ring supplied or with weather-proof 1/2" conduit fittings at the power/relay connection entry point.

# INSTALLATION INSTRUCTIONS

## LOAD APPLICATION RATINGS TABLE

Please check the following chart to match the requirements for your installation and then refer to the appropriate instructions for powering the hardware and connecting the load to be switched.

Load Power	Type of Load – Example of the load	Current (Amps) -> Other (HP, Watts)
120VAC	Motor Load – Exhaust Fan	7.2 A -> 1/3 HP
120VAC	Resistive - Heater	13 A -> 1500 W
120VAC	Pilot Duty – Step up Relay / Contactor	1/10A -> Contactor coil VA rating 120VA sealed / 1200VA Inrush
24VAC	Resistive or Inductive - HVAC or MAU Control	2 A
24VDC	Resistive or Inductive - HVAC or MAU Control	5 A
	Dry Contact Low Power Control - Robovent control or PLC control input	If < 0.3 A - Note: must use wetting capacitor supplied

Note: maximum of 13A continuous load

## MOUNT THE CONTROL CONTACT

**NOTE:** For best RF performance and signal strength, do not mount this device inside a metal box. Final installed unit should also be mounted with open space on 2 or more sides.

1. Select a suitable installation location for the Control Contact (e.g., close to the load that will be controlled)
2. Mount the Control Contact using the brackets included.
3. The installer is expected to select the correct hardware for mounting to the type of material they are working with.

## CONNECTING POWER AND SWITCHED LOADS TO THE CONTROL CONTACT

### NOTES:

- Disconnect all power before installation or service.
  - The COM/GND terminal of the Control-Contact 24VAC/VDC power input should not be tied to earth ground.
  - The Relay Circuits are separated from the power circuits once they are in the enclosure. Follow the NEC guidelines for conductors in the conduit to get through the gland into the enclosure. To maintain a watertight connection, the cables going through the gland must be in a single sheath.
    - NEC Section 725.136(l) allows Class 2 conductors to be installed with conductors of electric light, power, and Class 1 circuits when a minimum 2-inches of separation is maintained or if all of the Class 2 circuit conductors are in non-metallic-sheathed cables in addition to the insulation on the conductors.
  - The cable gland fits cable sizes .210" - .334" (5.3mm-8.5mm) PN: Heyco M3219GBH"
1. Open the enclosure cover and remove the metal bracket by undoing the two bottom screws. These are captive screws and will remain attached to the bracket. See Figure 1A.
  2. Feed the cable/wires through the cable gland. A 16AWG-5 conductor jacketed cable, 0.26" - 0.54" diameter, is recommended to maintain the IP rating of the enclosure. See Figure 1B.

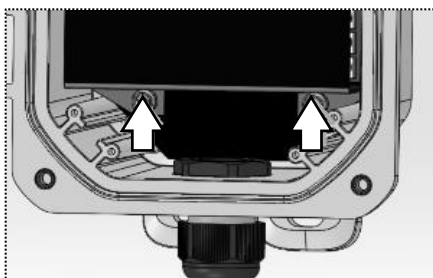


Figure 1A. Remove Wiring Compartment Bracket

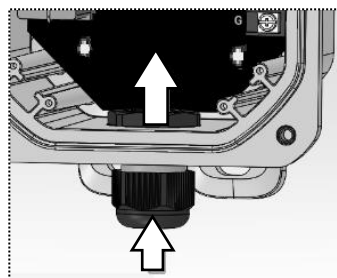


Figure 1B. Feed Cable/Wires.

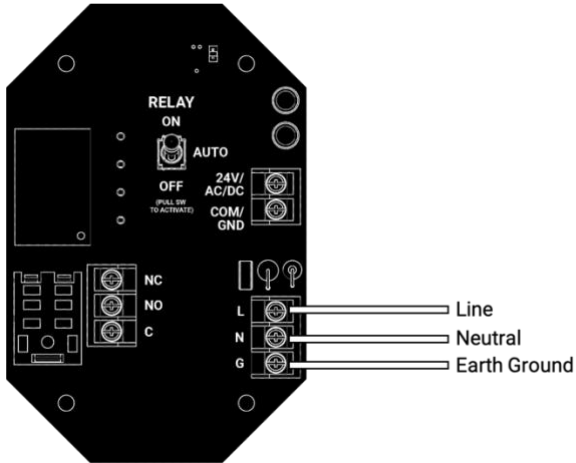
## **THERE ARE 3 WAYS TO POWER THE CONTROL CONTACT, SELECT THE BEST OPTION FOR YOUR APPLICATION**

**NOTE-** The power connections are inputs ONLY and are exclusive. Do not connect AC and DC to the device.

- POWER OPTION 1: 120VAC
- POWER OPTION 2: 24VAC
- POWER OPTION 3: 24VDC

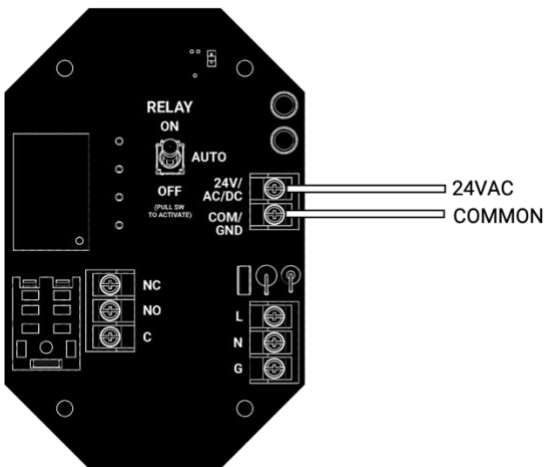
### **POWER OPTION 1: 120VAC**

For 120VAC power: Connect the 120VAC power wires to wire terminals L (Line) and N (Neutral) and connect the earth ground wire to G (Ground).



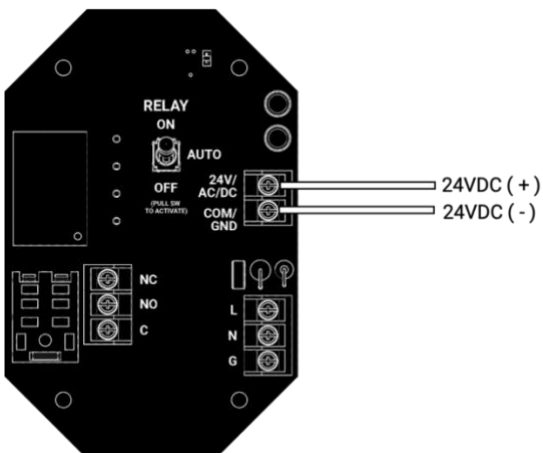
### **POWER OPTION 2: 24VAC**

For 24VAC power: Connect the 24VAC power wires (e.g. from an HVAC 24VAC transformer) to wire terminals 24VAC/DC and COM/GND maintaining the correct polarity.



### **POWER OPTION 3: 24VDC**

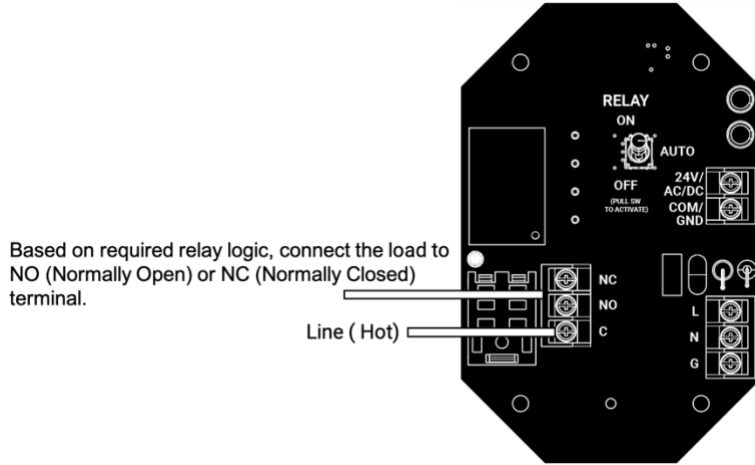
For 24VDC Powered: Connect the DC power supply wire (+) to 24VAC/DC and (-) to COM/GND.



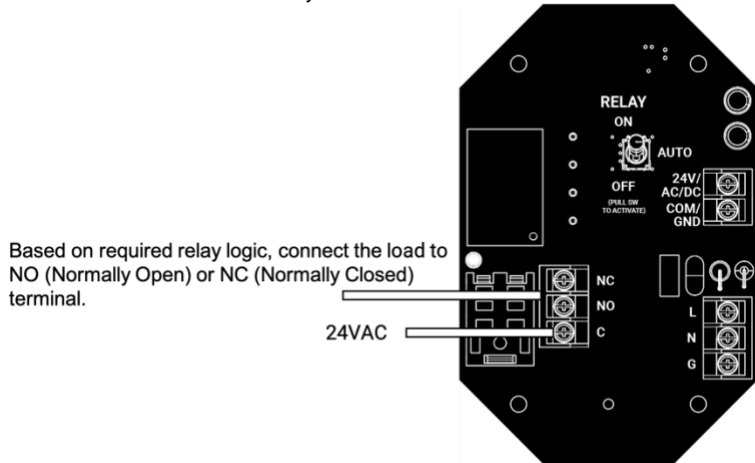
**SWITCHING LOADS- CHOOSE FROM THE FOLLOWING:**

**NOTE:** The relay in this device does not latch. If the device loses power, connections will default to the “normal” state. The normally open terminal will be open to common, and normally closed terminal will be closed to common. Please ensure you wire this power-loss default to the safest state possible. **Avoid mis-wiring. Pay attention to the NO and NC contacts.**

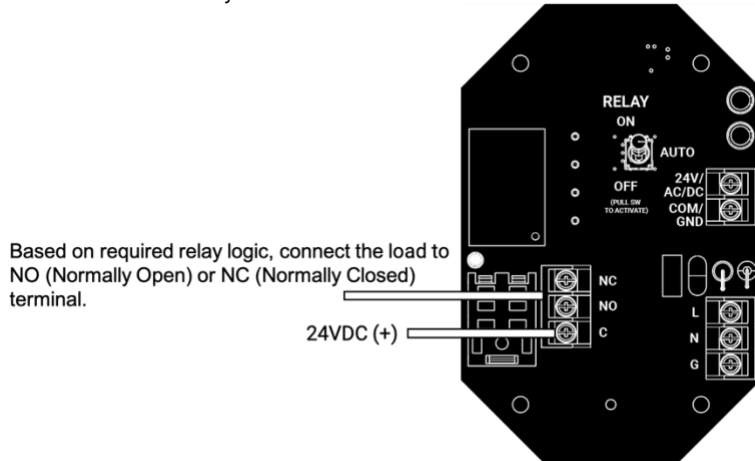
**120VAC Load relay Connections:** Connect the Line (hot) wire to the relay wire terminal C (Common) and depending on the required Relay Logic connect the Load wire to the NO (Normally Open) or to the NC (Normally Closed) terminal. See Figure 5. Never connect the Load to both the NO and the NC terminals.



**24VAC Load relay connections:** Connect the 24VAC Live wire to the relay wire terminal C and depending on the required Relay Logic connect the Load wire to the relay terminal NO or to the NC terminal.



**24VDC Load relay connections:** Connect the 24VDC (+) wire to the relay wire terminal C and depending on the required Relay Logic connect the Load wire to the relay terminal NO or to the NC terminal.



**Note:** for light DC loads of <math>< 0.3A</math>, e.g. dry contact applications, the supplied wetting capacitor must be connected across the relay terminals to avoid possible malfunction due to oxidation of the contacts.

**Note:** Observe polarity when connecting the capacitor

## **FINAL STEPS**

1. **Replace the wiring cover**

Reinstall the metal bracket, ensure the wires are properly routed under the bracket notches and tighten the two bottom screws, torque to 20 in-lbs.

2. **Tighten the cable gland**

Tighten the cable gland over the cable/wires and torque to 40-70 in-lbs, depending on the cable diameter and harness. to ensure the enclosure is properly sealed.

3. **Set the Manual Override Switch**

The Manual Override Switch is a 3 position DPDT toggle switch. The switch has a 0.5" long locking lever to actuate the switch, for safety the lever needs to be pulled to change the position of the switch.

When switched to the top position, the switch forces the relay to turn ON, it forces the relay OFF when switched to the bottom position and the relay is in AUTO (driven by the wireless interface) when switched to the center position. The Switch should be set for AUTO for normal operation.





4. **Close and latch the enclosure cover**

Check the gasket to make sure it is properly seated in the guide on the enclosure cover before latching closed. With the gasket properly seated in the guide, close and latch the enclosure cover.

5. **Configure the device**

Set up a zone and schedule in SimplySnap to automatically control the attached loads.

## **STATUS LEDs**

LED		Color	Status
NETWORK		Red	No Network Found (Communication Lost)
NETWORK		Blue	Network Found, Controller Not Configured (Not yet added to SimplySnap)
NETWORK		Green	Network Found, Controller Configured (Normal Operation)
RELAY		Orange	Relay is closed
RELAY		Off	Relay is open
AUTO		Green	Manual override switch is in the Auto position
AUTO		Off	Manual override switch is <b>NOT</b> in the Auto position
POWER		Blue	Power is on (normal)
POWER		Off	Power is off or has failed

## REGULATORY INFORMATION AND CERTIFICATIONS

**RF Exposure Statement:** This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

**Industry Canada (IC) certifications:** This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques dépassant les limites applicable aux appareils numeriques de la class B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

### FCC certifications and regulatory information (USA only)

**FCC Part 15 Class B:** This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) These devices may not cause harmful interference, and (2) These devices must accept any interference received, including interference that may cause harmful operation.

**RADIO FREQUENCY INTERFERENCE (RFI) (FCC 15.105):** 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: (1) Re-orient or relocate the receiving antenna; (2) Increase the separation between the equipment and the receiver; (3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected; (4) Consult the dealer or an experienced radio/TV technician for help.

Construction of control: Independently Mounted

Method of Mounting the Control: Surface Mounting

Type 1 Action, Pollution Degree: 4 / 2 (2 refers to the environment within the outdoor enclosure)

Impulse Voltage: 330V (when wired as Class 2) / 2500V (when wired as Class 1)

## CERTIFICATIONS

<b>Model</b>	: <b>CONTROL-CNTC-101</b>
<b>Contains FCC ID</b>	: U90-SM220
<b>Contains IC</b>	: 7084A-SM220
<b>ROHS</b>	: 3:2011/65/EU(2015/863)
<b>UL File No</b>	: E513705