

## INTRODUCTION

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The RGO-7747 is designed for cloud based access control applications. The RGO-7747 can be remotely programmed to operate up to 4 dry contact pairs in a variety of configurations. If properly installed the RGO-7747 is suitable for outdoor operation.

## ESD PRECAUTIONS

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The RGO-7747 can be damaged by electrostatic discharge (ESD). When handling the circuit board care must be taken so that it is not damaged. Damage

due to inappropriate handling is not covered by the warranty.

- Discharge yourself by touching a grounded bare metal surface before handling the circuit board.
- When the circuit board is removed from the enclosure store it in an antistatic bag.
- If available use an antistatic wrist strap when handling the circuit board.

## ① SELECTING A LOCATION

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The RGO-7747 can be mounted on a wall or backing panel. Choose a location for the RGO-7747 that is (if possible) out of direct sunlight or severe weather. The chosen location should also be safe from damage, vandalism, flooding, and lightning.

Keep in mind that some electrical interfaces (e.g. Ethernet and RS-485) may have maximum length restrictions.

Unlike many other access control systems there is no need to mount the RGO-7747 within RF range of the visitors. Choose a secure location that is convenient for installation.

## ② DRILLING CABLE HOLES

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Cable entry can be accomplished with either flexible liquid-tight conduit or cable glands. Try to minimize the number of holes necessary. Plan the placement of the holes to ensure easy connections and no interference with components inside the RGO-7747.

The enclosure should be mounted with the service USB ports towards the top and the latch towards the right side (when facing the unit). The latch must be above the pressure equalization valve to protect it from rain and ice formation.

Before drilling holes in the enclosure remove the four screws holding the circuit board and gently place the circuit board, screws, and felt washers in a clean, safe place.

Be sure to drill holes with exactly the right diameter for the cable glands and/or conduit bushings. Holes should always be drilled on the bottom of the enclosure around  $\frac{5}{8}$ " from the rear of the enclosure. Damage due to moisture is not covered by warranty in the event of improper installation.

Once drilling is complete clean any debris from the enclosure and mount the circuit board back in the enclosure.

For each drill hole mount a NEMA IP-68 cable gland or liquid-tight conduit fitting. Finally mount the circuit board back in the enclosure using the four screws and felt washers.

### ③ MOUNTING

To attach the mounting brackets, turn the enclosure such that the backside is visible. Place the mounting brackets over the octagon bosses either horizontally, diagonally, or vertically (see Figure 1). Fasten them with the ¼"-20 x 0.25", countersunk Phillips drive screws (torque limit = 30 in. lbs.).

Using the holes in the mounting brackets secure the enclosure vertically to the chosen mounting surface.

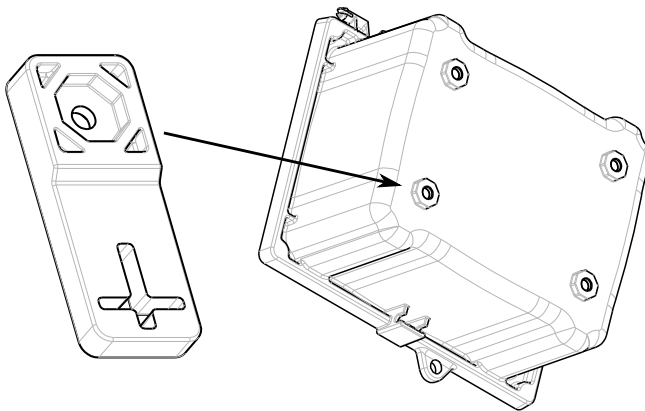


Fig 1: Mounting bracket

### ④ WIRING THE DRY CONTACTS

The RGO-7747 provides 4 dry contact connectors labeled P1 through P4. Each connector provides normally open (N.O.) and normally closed (N.C.) contacts rated for 10 A at 120 VAC (8 A at 30 VDC).

Most installations will use the normally open (N.O.) and common (COM) contacts. All of the dry contact terminals can perform a variety of functions and no special assignments are necessary. If a device requires a double-pole dry contact attach each pole to a separate dry contact pair. The service provider can configure several relays to operate in unison.

For each slave device (i.e. gate operator) choose one of the contact sets to operate that device (P1 through P4). Using a provided 3-pin Phoenix plug:

1. Use wire strippers to remove a portion of the cable jacket.
2. Remove at least ¼" (5mm) from the insulation of each wire.
3. Insert the wires into the correct terminal on the included Phoenix plug (see Fig. 2)
4. Tighten the screws to secure the wires. Do not use high-torque devices as this may damage the screws and/or connector block.

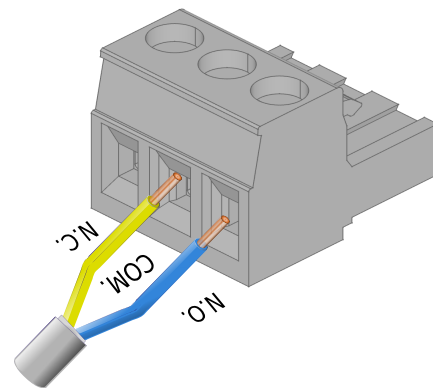


Fig 2: Connector Wiring

For devices that require an interruption in the path when activated (such as some magnetic door seals) use the normally closed (N.C.) terminal instead of normally open (N.O.).

Depending on the customer setup the relay may be inverted in software. This means the relay is de-energized when entry is requested rather than energized. In this configuration the opposite terminal is used (e.g. N.C. instead of N.O.). This configuration means a loss of power to the RGO-7747 will result in the entrance being held open.

**IMPORTANT:** When controlling gates such as barrier or swing gates it is important to ensure that the dry



contacts being used are not conditional on the presence of a vehicle to open the gate.

There is also a software “hold open” function that should be accounted for. If holding the dry contacts in the active state will keep the gate from closing then no further action is necessary. If a separate input is required to hold the gate open and this feature is desired then simply wire the additional input to a different relay output. The software can then be configured to use a separate relay for the “hold open” functionality.

### ⑤ POWER SUPPLY WIRING

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The RGO-7747 requires 12-30Vdc at 10W. DC power can be derived from a gate operator or external power supply. If battery backup power is required then an external battery backup power supply should be used.

Optionally a power supply module can be fitted inside the RGO-7747 enclosure to convert 100-240Vac to the required DC. This option requires that this step be performed in accordance with all national and local electrical and building codes. Consult a qualified electrician if necessary. For some installations an optional power cord may be fitted to the RGO-7747 for simplified installation.

As with the dry contacts use a 3 position Phoenix plug to provide power and a protective earth ground labeled SHIELD. Failure to wire SHIELD will void the warranty!

If you have an isolated power supply then it is recommended to tie SHIELD to GND in addition to a proper protective earth ground.

### OPTIONAL: RS-485 NETWORK WIRING

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The RGO-7747 includes an RS-485 interface to communicate with accessories such as keypads and relay extension modules.

RS-485 is a 3 wire interface consisting of a ground and a shielded twisted pair that is used to transmit and

receive data. It is important that the GND\_ISO terminal of the RS-485 connector be tied to the ground reference point of the devices on the RS-485 network.

**NOTE:** When shielded cable is used then it is very important that ONLY ONE END of the shield (drain) is grounded. Otherwise a ground loop will be created resulting in noise and possible data corruption. The other shield should simply be cut at the same place the jacket is cut and not electrically connected to anything. It is recommended to use heat shrink over the shield on the non-connected end.

The on-board RS-485 interface includes software controllable network termination and biasing. Please consult with your Tap2Open representative to ensure the proper configuration for your installation.

If necessary the RGO-7747 enclosure can also be used to house small components (e.g. bridge rectifiers, DC-DC converters, etc) as well as splices. It is important however to limit the amount of additional components in the enclosure to 15% of the free air volume. Failure to do so will void the warranty due to the reduced cooling ability of the enclosure.

### ⑥ CONNECTIVITY & PROGRAMMING

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The RGO-7747 can be fitted at the factory with an optional LTE cellular modem. In this case the unit will arrive pre-programmed with no need to perform any further steps in this section.



**Note:** When inserting Ethernet & USB connectors be sure to hold the connector to avoid stressing or flexing the circuit board!

If Internet connectivity is being provided via 802.11 (WiFi) then a text file, named `wifi.txt`, containing the network information must be written. See the section on configuring 802.11 for the format of this file. If Ethernet (and DHCP) is being used then no additional configuration is necessary beyond running an Ethernet cable with an appropriate cable gland.

Programming is accomplished with a USB flash drive.



To identify itself uniquely the device requires an X.509 digital certificate. This file, named `client.pem`, will be provided as part of the service subscription. This file should be placed in the root directory of a FAT formatted USB flash drive. If necessary `wifi.txt` should also be placed in the root directory of the USB flash drive along with `client.pem`.

Ensure power is applied followed by setting the power switch to "ON." Wait around 30-40 seconds for the system to initialize. As the system boots the display will show "b" (for bootloader) followed by "L" as it loads the software. Once the system has booted the display will show "U" (for Unconfigured) if it is not configured or a variety of other indicators as it tries to connect.

Once the display no longer shows "L" insert the USB flash drive containing the configuration files (above) into any of the front-facing USB ports and wait for at least 30 seconds.

Remove the USB flash drive. After successful programming the blue LED should be on solid (not blinking) indicating the RGO-7747 is connected to Tap2Open and is ready for operation.

If the unit does not eventually connect then check your configuration. If any mistakes were made the USB flash drive can simply be re-inserted and the RGO-7747 will store the new configuration.

**NOTE:** The USB flash drive is not required for operation. Once the RGO-7747 is operational the files on the USB flash drive should be erased for security reasons.

### OPTIONAL: CONFIGURING 802.11 (WiFi)

When Internet connectivity to the RGO-7747 is to be provided by 802.11 (WiFi) the programming step 6 (above) requires an additional file, named `wifi.txt`. This file contains the SSID (name) and password for the wireless network(s).

**NOTE:** The RGO-7747 only supports 2.4GHz wireless networks due to signal strength and range limitations of 5GHz 802.11.

You can create this file using any application that produces plain ASCII text files. On Microsoft Windows computers NOTEPAD can be used to prepare `wifi.txt`.

For a wireless network using WPA2 and TKIP security add the following lines to a blank file named `wifi.txt` for each network:

```
network={
  ssid="NETWORK NAME"
  psk="PASSWORD"
}
```

Ensure that the lines are formatted exactly as above, including spaces. Separate multiple network entries with a blank line.

For other 802.11 security mechanisms consult technical support for the proper formatting of `wifi.txt`.

Prior to power on, insert the 802.11 interface module into any of the USB ports on the RGO-7747.

### ⑦ SECURING THE LID / FINISHING UP

Once operation of the RGO-7747 has been verified close the enclosure door and secure it with the latch. Install the four #10-32 x 3/4" stainless steel screws in the four holes around the perimeter of the door. Torque no tighter than 15 in. lbs.

Ensure that any holes drilled into the enclosure in step 2 are properly sealed with silicone caulk if necessary.

**NOTE:** Do not seal or paint the pressure vent on the lower right vertical wall! This vent prevents condensation inside the RGO-7747 and must be able to breathe.



### ⑧ INDICATORS

The RGO-7747 provides several LEDs to help diagnose problems and monitor the unit:

- A blue LED indicates connectivity status. If this LED is solid then the connection is established. If this LED is blinking then the unit is searching for service.
- The RS-485 interface has green and red LEDs next to the connector. When data is transmitted the green LED will blink. When data is being received the red LED will blink. If a device (such as a keypad) is connected there will be continual data transmission in the event of successful communication.
- There are 4 yellow LED indicators above each relay indicating the state of that relay.

Additionally the RGO-7747 also includes a 7 segment display:

Display	Meaning
b	Booting. This state should only be shown for a few seconds.
L	Loading. The software is being loaded into memory and can take up to 30 seconds.
3	Starting cellular modem. If configured with a cellular modem this indicates the cell modem is being initialized.

Display	Meaning
4	Searching for cellular service.
U	Connecting to cellular Internet service.
H	Host name lookup. The unit is waiting for an answer from the DNS servers provided by your Internet connection.
C	Connecting. The unit is attempting to connect to Tap2Open.
A	Active. The unit is connected and operating properly.  <b>NOTE:</b> If configured for "dark mode" the display may be blank in this case to avoid being a distraction.
P	Paused. The unit is <b>offline</b> and waiting before attempting to connect again.
d	Disconnected. The unit will attempt to reconnect momentarily.
F	Firmware update. The unit is applying a firmware update and will automatically restart after the update is applied.
U	Not configured. The unit has not been configured with a <code>client.pem</code> file.
0	Shutdown. The unit is shutting down due to an internal issue.