



Installation & Operations Manual



VoIP Command Center

2YEAR
WARRANTY

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RP8500PBXVOIPG
Ver. 5
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Thank you for purchasing a RATH® VoIP Command Center. We are the largest Emergency Communication Manufacturer in North America and have been in business for over 35 years.

We take great pride in our products, service, and support. Our Emergency Products are of the highest quality. Our experienced customer support teams are available to remotely assist with site preparation, installation, and maintenance. It is our sincere hope that your experience with us has and will continue to surpass your expectations.

Thank you for your business,

The RATH® Team

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Items Needed

Included

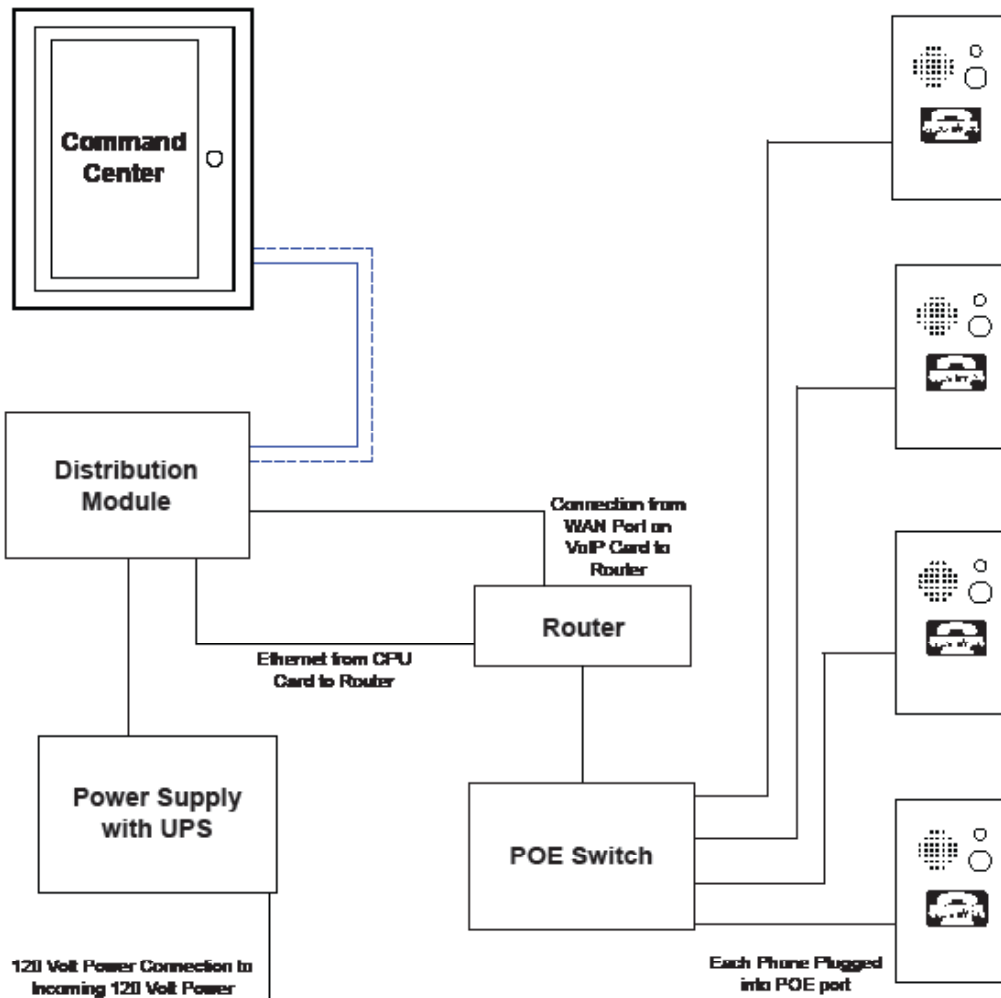
- Command Center Phone (will be mounted in a cabinet or include a desk mount stand for desk mount)
- Distribution Module
- System wiring (pigtail cables, power cord, phone line cord, and Ethernet cable)
- 1/8" Hex Allen Wrench (cabinet mount only)

Not Included

- Network Switch (POE+ recommended)
- Router
- Windows laptop
- Minimum 22 or 24 AWG twisted, shielded cable for wiring Command Center to Distribution Module (unless ordered as an IP Command Center Phone)
- 120vac power
- Multimeter
- Analog phone (recommended for troubleshooting)
- Analog or digital phone line (only if the system needs call out abilities)
- Small Phillips screwdriver
- Mounting hardware
- Power supply with battery backup (sold separately, RATH® model RP7700104 or RP7701500)
- 2100 Series IP Emergency Phones (sold separately)



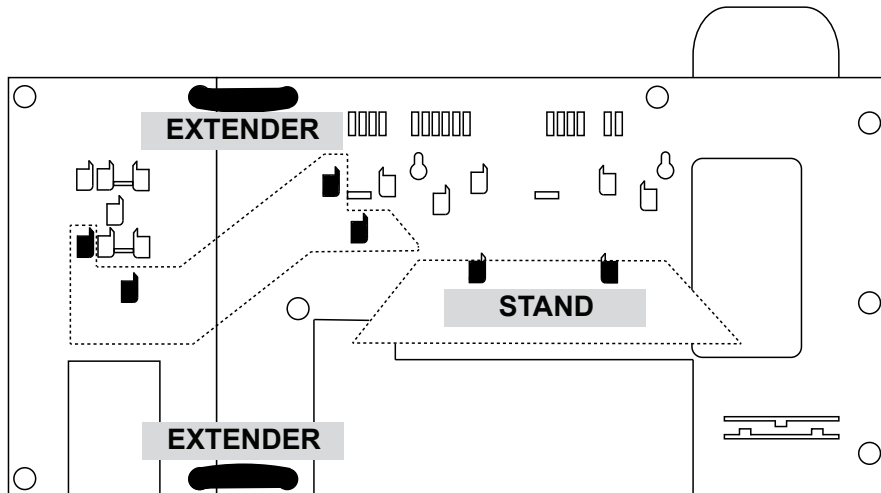
Typical System Layout



Installation Steps

1. Mount the Distribution Module and power supply with battery backup in an appropriate location (network closet recommended).
2. Plug power supply with battery backup into a standard 120v wall outlet.
Note: System is to be powered by a grounded 120v, 60Hz, AC outlet protected by a 15A maximum circuit breaker.
3. Using the provided power cord, plug the 3-pin female connector side into power input next to the power switch on the Distribution Module. Plug the male 3-prong side of the power cable into any of the open outlets on the back of the power supply with battery backup. Wait to power on the Distribution Module until all connections are made.
4. Install the Command Center Phone.

Desk Mount: Install the foot stand on the back of the Command Center Phone and choose location per owner's specifications. If the system is over 16 zones, connect additional button consoles to the Command Center using the provided extenders. Refer to the diagram below for attaching the extenders and foot stands.



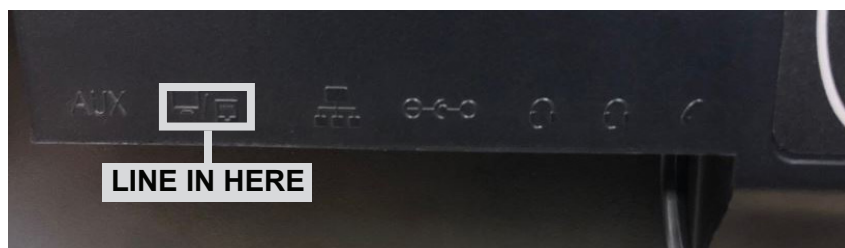
Cabinet Mount: Use the provided Allen Wrench to remove the back box or back plate from the cabinet. Remove any applicable knockouts. Mount the backbox or plate in location per owner's specifications using appropriate mounting hardware. Reassemble the cabinet.

5. Run at minimum a single 22 or 24 AWG twisted, shielded cable from the Command Center Phone back to the Distribution Module. This single cable provides communication and power. No additional power is needed for the Command Center.

Note: The maximum wire run length from the Distribution Module to the Command Center is 6,200' for 22 AWG and 3,900' for 24 AWG.

6. Using a biscuit jack, screw the twisted, shielded pair landed at the Command Center side to the red and green screws of the biscuit jack. Plug the phone line cord provided with the Command Center into the female RJ11 jack on the biscuit jack. Plug the other end of the phone line cord into the input port on the back of the Command Center.

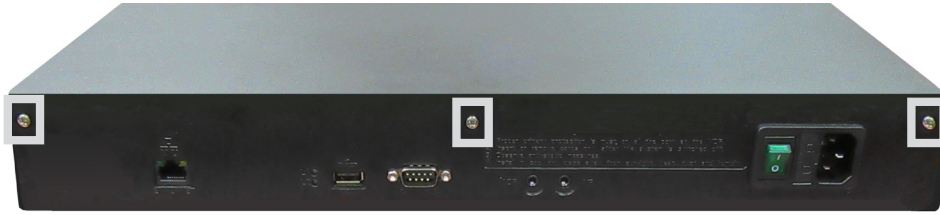
Note: If using an IP Command Center, go to page 11 for wiring and setup.



Distribution Module Wiring

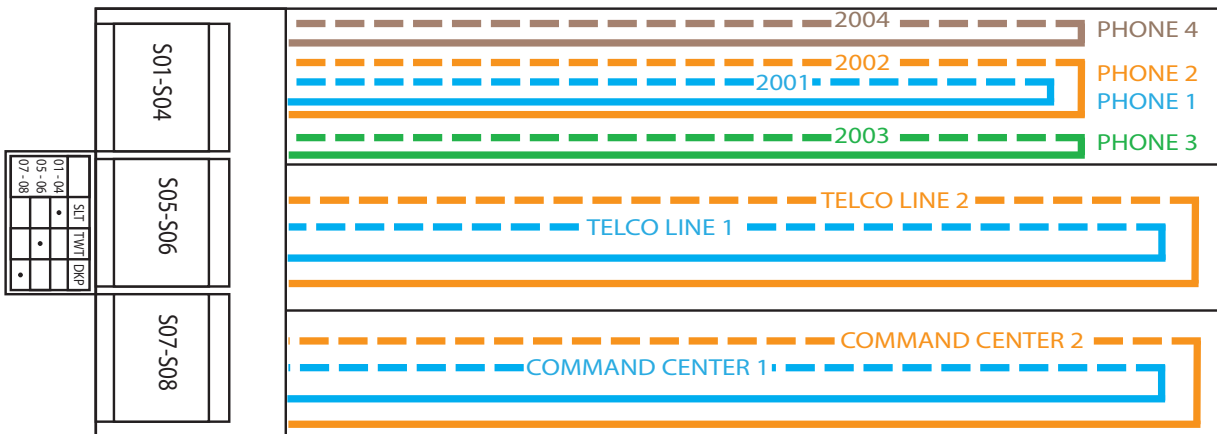
Option 1: 1-48 Zone VoIP Systems

For 1-48 zone systems, remove the screws on the back of the Distribution Module and remove the cover to expose the internal RJ45 connections.



- On top of each RJ45 port, there is a label indicating connection:
 - SLT is the port used for connecting **HARDWIRED** Emergency Phones
IP EMERGENCY PHONES DO NOT CONNECT TO THE DISTRIBUTION MODULE
 - DKP is the port used for connecting the Command Center Phone
 - TWT is the port used for outside Telco Line
 - Plug the supplied RJ45 pigtail cables into the RJ45 connections on the Distribution Module following the wiring chart and pin-out color scheme below
- Refer to the top of the cards to see what type of RJ45 port and number of extensions
- The system uses T568-A for pin-out wiring
- The first card installed will always be:
 - Port 1: (01-04) Connection for 4 **HARDWIRED** Emergency Phones (SLT)
IP EMERGENCY PHONES DO NOT CONNECT TO THE DISTRIBUTION MODULE
 - Port 2: (05-06) Connection for 2 Telco Lines (TWT)
 - Port 3: (07-08) Connection for up to 2 Command Center Phones (DKP)

Card 1:



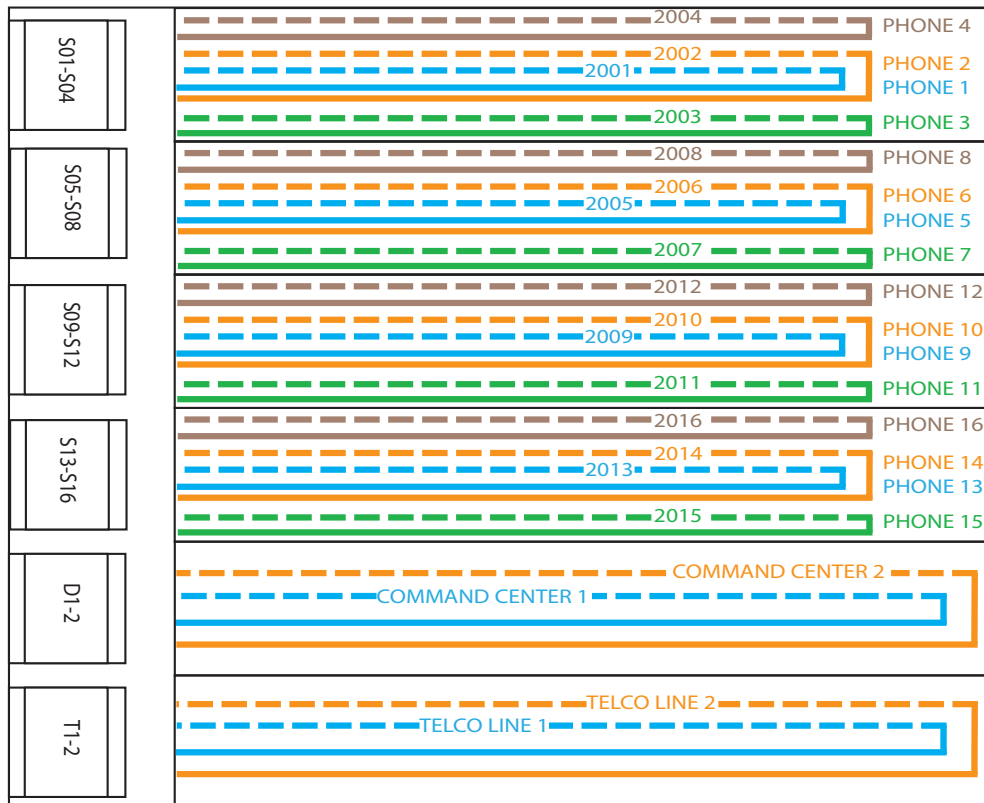
Note: DO NOT plug anything into the sixth card labeled "VMS".

- Once all RJ45 connections are made, connect twisted, shielded pairs onto pigtail sides of the wiring harnesses

Option 2: 64-128 Zone VoIP Systems

- On top of each RJ45 interface there is a label indicating connection:
 - S01-S_ is the port used for connecting **HARDWIRED** Emergency Phones
IP EMERGENCY PHONES DO NOT CONNECT TO THE DISTRIBUTION MODULE
 - TD (1-2)(3-4) with a dot under the D is the port used for connecting Command Center Phone(s)
 - TD (1-2)(3-4) with a dot under the T is the port used for outside Telco Line
- Plug the supplied RJ45 pigtail cables into the RJ45 interface connections following the wiring chart and pin-out color scheme below
- Refer to the top of the cards to see what type of RJ45 interface and number of extensions
- The system uses T568-A for pin-out wiring
- The first card installed will always be:
 - Port 1: (S01-S04) Connection for 4 **HARDWIRED** Emergency Phones
IP EMERGENCY PHONES DO NOT CONNECT TO THE DISTRIBUTION MODULE
 - Port 2: (S05-S08) Connection for 4 **HARDWIRED** Emergency Phones
 - Port 3: (S09-S12) Connection for 4 **HARDWIRED** Emergency Phones
 - Port 4: (S13-S16) Connection for 4 **HARDWIRED** Emergency Phones
 - Port 5: (D1-2) Connection for up to 2 Command Center Phones
 - Port 6: (T1-2) Connection for up to 2 Outside Telco Lines

Card 1:

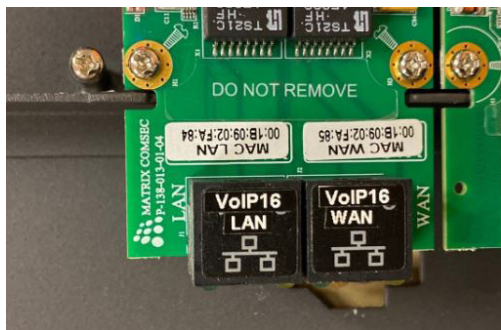


Note: Do not use the green and brown pairs

- Once all RJ45 connections are made, connect twisted, shielded pairs onto the pigtail sides of the wiring harnesses.
7. Turn on the 120vac power supply (if not already done).
 8. Turn on the Distribution Module.

Connecting System to Network

9. Connect the Ethernet cable from the WAN port on the VoIP Card on the Distribution Module to the router.



10-48 Zone



64-128 Zone

10. Connect Emergency Phones to the system:

a. IP Phones:

- Connect the Ethernet cable from the POE port on the emergency phone to the POE+ switch
- CAT5e or CAT6 is recommended
- Do not exceed the maximum wire run length of 320'

b. Elevator Phones (Analog Phones with IP Interface):

- Connect the Ethernet cable from the IP Interface to a network switch (do not exceed the 320' maximum wire run length)
- Connect the two-wire line cord from the LINE output on the IP Interface to the phone line input on the Elevator Phone board
- CAT5e is the minimum standard cable for the system (please check with your local AHJ to ensure compliance with state and/or local codes)

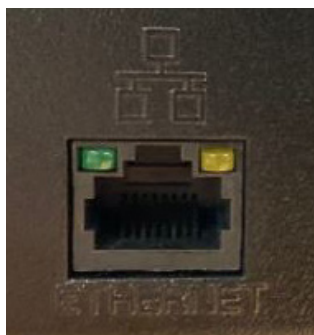
VoIP Card Programming

11. Program the VoIP card:

Note: If network information is provided to RATH® at the time of purchase, no additional information needs to be entered for the VoIP card. If network information is NOT provided, the following needs to be performed:

a. Connect the Ethernet port of the Distribution Module to your Windows laptop using an Ethernet cable

- For 1-48 zone systems, the Ethernet port is located on the back of the housing (same side as the power switch)
- For 49-128 zone systems, the LAN Port is used



10-48 Zone



64-128 Zone

b. Change the IP address of the laptop's Network Interface Card

- Navigate to **Control Panel**
- Click on **Network and Internet**
- Click on **Network and Sharing Center**
- Click on **Change Adapter Settings**
- Right click on **Ethernet/Local Area Connection**
- Click on **Properties**
- Double click on **Internet Protocol Version 4**
- Click on **Use the Following IP Address:**
 - Change IP to the default IP address range of the Distribution Module (**192.168.1.200** is recommended)
 - Change Subnet Mask (default is **255.255.255.0**)

c. Turn off the wireless card of the laptop (if applicable)

d. Log into the Distribution Module

- Enter **192.168.1.202** into the web browser (Google Chrome is recommended)
- Log in as System Engineer and enter password **Rath7284!**

e. Change Programming Port IP Address

- Navigate to **Master Ethernet Port Parameters** in left side menu
- Click on the **+** icon next to **IPV4 Settings**
- Enter desired **IP Address, Subnet Mask, and Gateway**
- Click **Submit**
- Click the lock icon in the top right hand corner to log out of the system
- Follow the instructions listed in step b to change the IP address of the PC to an address that is in the same address range of the Programming Port
- Log back into the Distribution Module using the new IP address (password will not change)

f. Enter VoIP Information

- Navigate to **VoIP Configuration** in left side menu
- Click the drop down arrow, more menu options should appear
- Click **VoIP Port Parameters**

g. Enter Server Information (this will be the SIP Server information for the IP Emergency Phones)

- Navigate to **WAN Port (IPv4 Settings)**
- Enter the assigned network IP address into the **IP Address** line
- Enter the Subnet Mask of your network into the **Subnet Mask** line
- Enter the Router IP address into the **Default Gateway** line
- Click **Submit**

h. Setting up SIP Extensions

- Click on **SIP Extension Settings**
- **VOIP Port 1** should be selected
- Enter the desired name in the **Name** line
- Enter the extension in the **SIP ID** line
- **Note:** This must be a number above 4000 to avoid issues within the system (Example: Extension 1 = 4001, Extension 2 = 4002).
- Enter the desired password in the **Password** line (follow the password requirements displayed on the screen)
- Click **Submit**

The screenshot shows the ETERNITY web interface. On the left is a navigation menu with categories like E&M Configuration, Hotel Settings, ISDN Configuration, License Management, Mobile Configuration, and Regional Settings. The main content area is titled 'Network Parameters' and includes sections for 'Master Ethernet Port', 'IPv4 Settings', 'Domain Name Server (DNS) for IPv4', 'IPv6 Settings', 'Domain Name Server (DNS) for IPv6', 'Dynamic DNS (DynDns.org)', 'Router's Public IP Address', 'Simple Traversal of UDP over NAT (STUN)', 'Use MAC Cloning', and 'Web Server Management'. The 'IPv4 Settings' section is expanded, showing a 'Connection Type' dropdown set to 'Static' and a table for IP configuration:

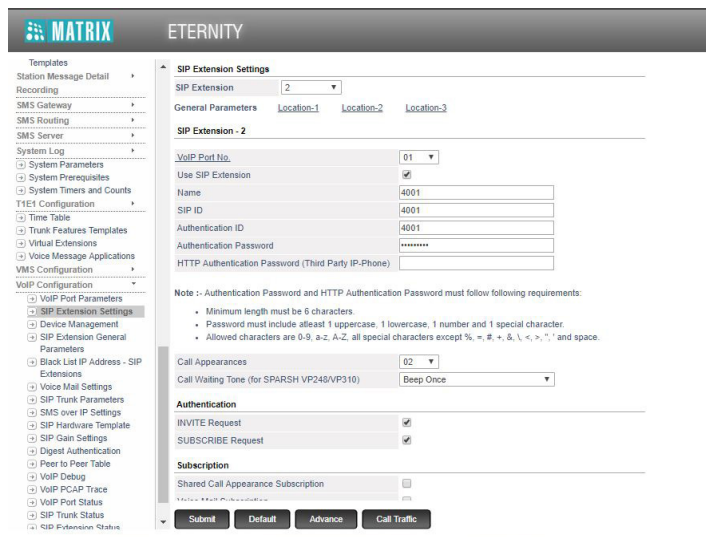
IP Address	192	168	001	112
Subnet Mask	255	255	255	000
Default Gateway	192	168	001	001

At the bottom of the configuration area is a 'Submit' button.

The screenshot shows the ETERNITY web interface. On the left is a navigation menu with categories like Station Message Detail, Recording, SMS Gateway, SMS Routing, SMS Server, System Log, System Parameters, System Prerequisites, System Timers and Counts, TIE1 Configuration, Time Table, Trunk Features Templates, Virtual Extensions, Voice Message Applications, VMS Configuration, and VoIP Configuration. The main content area is titled 'VoIP Port - 1' and includes sections for 'LAN Port (IPv4 settings)', 'WAN Port (IPv4 settings)', 'Domain Name Server (DNS) for IPv4', 'LAN Port (IPv6 settings)', 'WAN Port (IPv6 Settings)', 'Domain Name Server (DNS) for IPv6', 'MAC Address', 'Dynamic DNS (DynDns.org)', and 'VoIP Server Domain'. The 'WAN Port (IPv4 settings)' section is expanded, showing a 'Connection Type' dropdown set to 'Static' and a table for IP configuration:

IP Address	192	168	001	113
Subnet Mask	255	255	255	000
Default Gateway	192	168	001	001

At the bottom of the configuration area are 'Submit', 'Default', and 'Advance' buttons.



Registering Emergency Phones

Follow the instructions provided with the Emergency Phones to register the phones to the system. If network information is provided to RATH® at the time of purchase, phones will already have the registration information entered.

After all phones are registered, verify that all of them show up on the system and show registered. Log into the Distribution Module and scroll down to **VoIP Configuration** in left side menu. Click **SIP Extension Status**, this will allow you to see all connected devices. If any device shows **Not Registered**, the information entered into the Distribution Module does not match what was entered in the Emergency Phone. This needs to be corrected.

SIP Extension	VoIP Port No.	Name	SIP ID	Status	Contact 1
1	01	4001	4001	Not Registered	
2	01	4002	4002	Not Registered	
3	01	4003	4003	Not Registered	
4	01	4004	4004	Not Registered	
5	01	5001	5001	Registered	

Emergency Phone Programming

Phones should be programmed for Memory Location 1 to dial 3931 to call the Command Center first.

1. Press **ENTER** to enter Programming Mode
2. Press **1, ENTER, 3931, STOP**
3. Press and hold **STOP** for 3 seconds to exit Programming Mode

The system can be programmed to dial an outside number if the call is not answered at the Command Center. To do this, perform the following steps at the Command Center:

1. Press the speaker phone button
2. Dial **1, 3, 4**
3. Dial **9, the external number, #, *** to store the number
4. Verify the Command Center display shows "Forwarded On" followed by the phone number entered
5. Press the speaker phone button to hang up

Note: To turn off call forwarding, dial **1, 3**, followed by the **GREEN** button.

You can program or modify the location message for the phone. All phones come with a default location message. Message must be changed or disabled on all phones.

1. Press **ENTER** to enter Programming Mode
2. Press **1, 3, ENTER, 3**
3. Press **6, RECORD** key, after the beep speak message adding "For two-way communication, press * at any time" to the end, **STOP**
4. Press **6, Play/Pause** to play message back
5. Press and hold **STOP** for 3 seconds to exit Programming Mode

Note: For no message, press **ENTER** to enter Programming Mode, **1, 3, ENTER, 0**, then press and hold **STOP** for 3 seconds.

Setting the Date and Time

Perform the following steps on the Command Center Phone:

1. Enter Programming Mode:
 - a. Dial **1#91**
 - b. Enter Password **7284**
2. Program the time zone:
 - a. Dial **1002** followed by the appropriate time zone code:
Eastern Time Zone = **111** Mountain Time Zone = **113**
Central Time Zone = **112** Pacific Time Zone = **114**
 - b. Touch the **GREEN** button in the middle of the phone when finished
3. Program the date (month-day-year format):
 - a. Dial **1001** followed by the date (Example: 1001 15 02 2011 for February 15, 2011)
 - b. Touch the **GREEN** button in the middle of the phone when finished
4. Program the time (military time including hour-minute-second):
 - a. Dial **1003** followed by the time (Example: 1003 143000 for 2:30pm)
 - b. Touch the **GREEN** button in the middle of the phone when finished
5. To exit Programming Mode dial **00** followed by the **GREEN** button

Command Center Operating Instructions

Indicator Status:

1. **Red LED Light:** Incoming call or connected to outside party
2. **Blue LED Light:** Active call
3. **Blue LED Flashing:** Call on hold

Answering Call at Command Center:

1. Lift the handset to answer the first incoming call. The Command Center must ring before the call can be answered.
2. If multiple calls are coming in, press the red LED light next to the desired call (this will place the original call on hold).

Note: The phone may be in the process of playing the location message when the call is answered at the Command Center. Follow the prompts in the location message to stop the message and establish two-way communication.

Disconnecting Calls:

1. Select the desired flashing blue LED and press *, # .
2. Each call must be disconnected individually.

Note: If you hang up the handset before disconnecting each call, the LED(s) will remain illuminated. Lift the handset, press the illuminated LED, the number **5** button, then *, #. To disconnect, hang up the handset. Repeat for each illuminated LED.

Joining a Call Already in Progress:

1. Pick up the handset, press the **red LED**, then the number **5** button.
2. You will be in a three-way conversation with the outside party and location.

Calling a Location:

1. Pick up the handset and press the button for desired location.

Sub-Master Phones

A RATH® Command Center System comes with a single base station phone. It can accommodate one additional base station phone which connects to the second DKP port on the first card. If your system includes more than two additional base station phones, there will be an additional card of just DKP ports. The additional base station wires will wire back to the Distribution Module the same way as the main Command Center described on page 4.

Note: If using an IP Command Center, see below for wiring and setup.

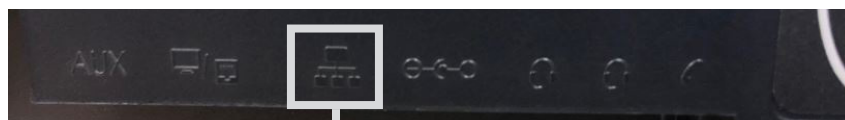


IP Command Center Phones

If using the IP Command Center Phone, run the Ethernet cable from the Ethernet port on the back of the Command Center Phone to the network switch (do not exceed 320' maximum wire run length). If network information is provided to RATH® at the time of purchase, no IP information needs to be modified in the Command Center Phone.

Using the keys on the Command Center Phone:

1. Tap the **MENU** button.
2. Select **NETWORK PARAMETERS** and tap the **GREEN** button next to the keypad.
3. Use the arrows to scroll down to **IP ADDRESS**. Enter the new IP address (wait 1 second after each number before moving on to the next). Tap the **GREEN** button to save.
4. Use the arrow keys to scroll down to **SUBNET MASK**. Enter the new Subnet Mask (wait 1 second after each number before moving on to the next). Tap the **GREEN** button to save.
5. Use the arrow keys to scroll down to **GATEWAY**. Enter the new Gateway IP address (wait 1 second after each number before moving on to the next). Tap the **GREEN** button to save.
6. Use the arrow keys to scroll down to **SIP SERVER**. Enter the SIP Server IP address (WAN port IP Address entered into the Distribution Module). Tap the **GREEN** button to save.
7. Tap the **EXIT** button. Unit will reboot.



LINE IN HERE

Troubleshooting

Problem	Possible Cause & Solutions
Command Center won't power on:	<ul style="list-style-type: none"> • Check wires for voltage. The Command Center Phone uses the blue, blue white pair of wires and should have 28vdc on them. • If wires show 0v, verify the DKP port on the Distribution Module is being used. • If wires show 48vdc, the Command Center Phone is connected to an SLT port and needs to be moved to the DKP port. • Verify the RJ11 jack is plugged into the correct plug on the back of the Command Center phone.
Phones won't register:	<ul style="list-style-type: none"> • Verify the SIP Extension settings on the Distribution Module match the Emergency Phones. • Verify the Authentication Password meets system complexity requirements. • Verify the IP address hasn't been blacklisted. After logging into the Distribution Module, scroll down to VoIP Configuration, click Blacklist IP Address, SIP Extensions, Clear All. • Verify nothing else on the network shares the IP address assigned to the phone. • Make sure the IP address of the Emergency Phone is in the same network as the SIP Server.
Phones won't call the Command Center:	<ul style="list-style-type: none"> • Verify the Command Center is fully booted and displays 3001 on the screen. • Verify phones show Registered under SIP Extension Status. • Verify phones are programmed to dial 3931.
Calls won't forward out:	<ul style="list-style-type: none"> • Verify call forwarding has been set up on the Command Center. • Verify the Command Center can place a call out by lifting the handset, dialing 9, then a phone number. If a message shows up on the Command Center screen saying, "All Trunks Busy", the system does not have an active phone line connected to it. • Verify the phone line is connected to the TWT port and is using the blue, blue white pair. Phone line should have voltage and dial tone on it. • Verify dialing string for forwarding number.
Blue light on the top right corner of the Command Center won't stop blinking:	<ul style="list-style-type: none"> • A blinking light indicates a missed call. • To clear the missed calls, click the button under "LOGS" on the Command Center screen. When the screen displays "Missed Calls" click the green button and use the arrows to scroll up and down to view the calls. Press the speaker phone button to exit.
Phones won't hang up:	<ul style="list-style-type: none"> • RATH® 2100 Series IP Phones require an Open-Loop Disconnect signal to properly hang up. This setting should be pre-programmed into the phones but may need to be increased. • Follow the instructions provided with the Emergency Phones to navigate and modify this setting. • The operator at the Command Center or monitoring location can press *, # before they hang up to force the Emergency Phone to hang up.
Insufficient volume on phones:	<ul style="list-style-type: none"> • Adjust the local volume potentiometer (VR1) on the Emergency Phone. • If the volume is still poor, log into the Distribution Module and scroll down to VoIP Configuration in the left side menu. Click SIP Gain Settings and modify the SIP-SYSTEM Rx-Gain settings in the Template 1 column. It isn't recommended to exceed 6 dB as it may cause feedback. Click Submit to save.