

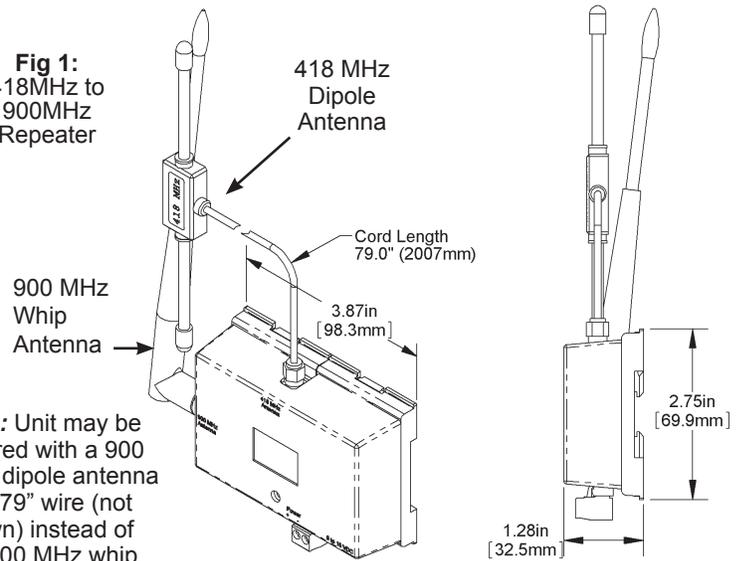
### Product Identification and Overview

#### 900 MHz Wireless System with a Repeater:

The Transmitter measures the room temperature or temp/humidity and transmits the data at 418MHz to a Repeater up to 100 feet away. The optional temperature setpoint and override status are also transmitted at 418 MHz to the Repeater. The transmit rate is approximately once every 20 seconds with an estimated battery life of 5 to 8 years.

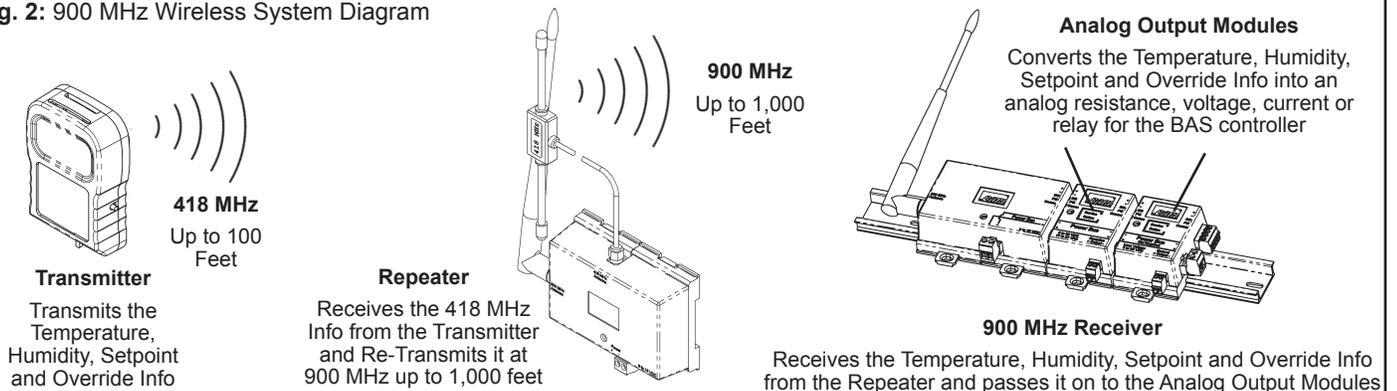
The 418 MHz information sent by the Transmitter is picked up by the Repeater and then Re-Transmitted at 900 MHz to a 900 MHz Receiver up to 1,000 feet away. The 900 MHz receiver picks up the information from the repeater and then passes it along to the Analog Output Modules. Each transmitted variable (temperature, humidity, etc.) is converted by a separate output module into an analog resistance, voltage, current or relay contact which is hard wired to the analog inputs of the BAS controller.

**Fig 1:**  
418MHz to  
900MHz  
Repeater



**Note:** Unit may be ordered with a 900 MHz dipole antenna on a 79" wire (not shown) instead of the 900 MHz whip antenna shown.

**Fig. 2:** 900 MHz Wireless System Diagram



### Specifications

**Supply Power:** 9 to 15 VDC, 150mA

**Power Consumption:** 150 mA max. DC

**Terminations:** 2 power terminals,  
2 antenna screw connectors

**Antennas:** Included  
418MHz 7" dipole with 79" cable  
900MHz 7" whip + 1.4" bend  
900MHz Optional (-EA) 4" dipole w/79" cable

**Input Signal:**  
418MHz -112db  
900MHz -110db

**Output Signal:** 900MHz 100mW (7 Channels Avail.)

**Ambient Operation:**  
Temperature -20 to 140°F (-30 to 60°C)  
Humidity 5% to 95%RH, Non-condensing

**Encl. Material:** ABS Plastic, UL94 V-0

**Overall Dimensions:** 3.32 W x 2.87 L x 1.28"H (84.3 x 98.2 x 32.5mm)

**FCC Approval #:** MCQ-XBPS3B (Repeater Unit Only)

**Compliance:** This device complies with Part 15 of the FCC rules Operation is subject to the following conditions.

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

**FCC Radio Frequency Interference Statement:**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15, Subpart B, of the FCC Rules. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause interference to radio communications.

Specifications subject to change without notice.

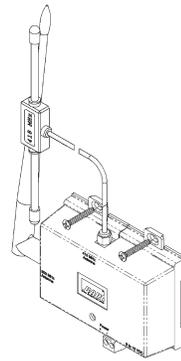
### Mounting of the Repeater

Mount the repeater within range of the 418 MHz transmitters or other repeaters. Mount the 418 MHz dipole antenna to a nonconductive surface so that both antennas are in a vertical orientation. Secure the antenna cable without kinking the cable or creating mechanical stress to the cable.

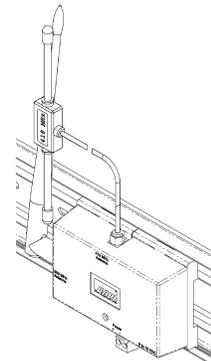
The 900 MHz antenna is shipped loose. Connect the antenna by turning the antenna nut onto the repeater's fitting. The repeater should be within range of the 900 MHz receiver. If the repeater is placed inside a metal enclosure, mount the antennas outside of the enclosure. (For more on antenna placement, see the "Mounting and Locating of Antennas" section.)

The repeater can be mounted to a flat surface or onto Snaptrack or DIN Rail (see Figs 3 to 5)

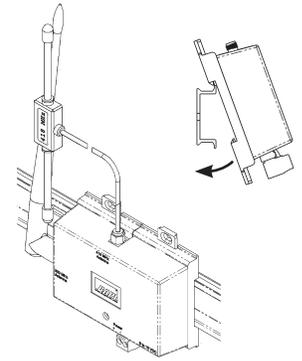
For surface mounting, push out the blue mounting tabs on the bottom of the repeater. Attach the repeater to the surface by inserting a #4 screw into each blue tab. For snaptrack mounting, push in the blue mounting tabs on the bottom of the repeater and it will now fit into the board slots of 2.75" snaptrack. For DIN Rail mounting, push out the blue mounting tabs on the bottom of the repeater and it will now snap onto DIN Rail. Catch the EZ mount hook on the edge of the DIN rail as shown in Fig 5. Then rotate into place.



**Fig 3: Surface Screw Mount**



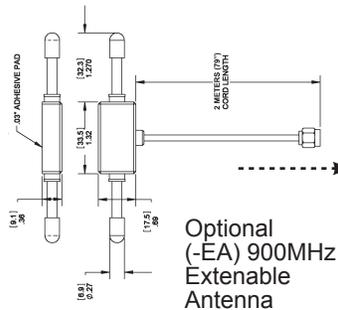
**Fig 4: Snaptrack Mount**



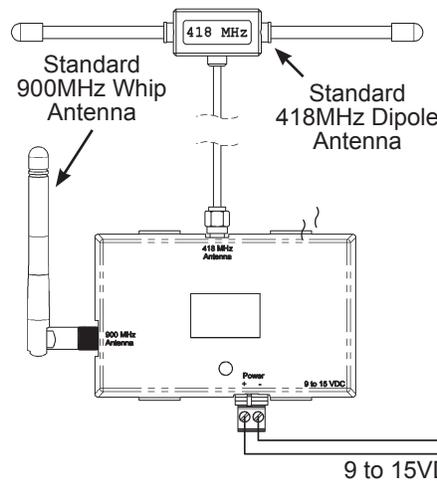
**Fig 5: DIN Rail Mount (Hook & Tilt In)**

### Terminations

The repeater is powered by separately purchased 9 to 15 VDC power supply. Connect the terminal labeled "-" to the power supply's negative. Connect the terminal labeled "+" to the positive power supply terminal. Install antennas into correct lead connections and be sure the antennas are at least one (1) foot apart.

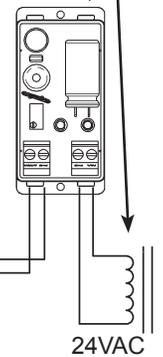


Optional (-EA) 900MHz Extensible Antenna



**Fig 6: Termination**

Separately purchased power supply (BAPI VC350A Voltage Converter) and transformer



### Channel Setup

Each Repeater and Receiver can be set up with and one of seven 900 MHz transmission channels that do not interfere with the other 6 channels. The repeater and the associated 900 MHz receiver must be on the same channel or they will not communicate. All 418MHz transmitters that are within range of the repeater can be heard by the repeater no matter what channel the 900MHz transmission signal is set to. The exact list is shown below.

REPEATER CHANNEL INFORMATION			
Repeater Part #	Repeater Channel	Repeater Internal Radio Setup Channel	Radio Setup Net ID Hop Table
BA/RPT49-EA	Standard	505	5 (Standard)
BA/RPT49A-EA	Channel A	399	1
BA/RPT49B-EA	Channel B	398	2
BA/RPT49C-EA	Channel C	397	3
BA/RPT49D-EA	Channel D	395	4
BA/RPT49E-EA	Channel E	555	5
BA/RPT49F-EA	Channel F	901	6

RECEIVER CHANNEL INFORMATION			
Receiver Part #	Receiver Channel	Receiver Internal Radio Setup Channel	Radio Setup Net ID Hop Table
BA/RPT49-EA	Standard	505	5 (Standard)
BA/RPT49A-EA	Channel A	399	1
BA/RPT49B-EA	Channel B	398	2
BA/RPT49C-EA	Channel C	397	3
BA/RPT49D-EA	Channel D	395	4
BA/RPT49E-EA	Channel E	555	5
BA/RPT49F-EA	Channel F	901	6

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### Mounting and Locating of the Repeater Antennas

The Repeater may be located inside a metal enclosure but the antennas must be outside the enclosure. The Repeater comes standard with a 418 MHz Dipole Antenna and a 900 MHz “Whip” Antenna, but is available with a 900 MHz Dipole Antenna.

#### 418 MHZ DIPOLE ANTENNA MOUNTING

To mount the 418 MHz dipole antenna, peel off the protective film from the adhesive pad and stick the antenna to a wall or other non-metallic support so that antenna is vertical for best reception. A wooden or plastic furring strip or PVC pipe attached to a ceiling beam w/U bolts makes a great mount. The antenna may be hung from any ceiling fixture using fiber or plastic twine, do not use wire. Do not use perforated metal strapping, commonly called plumbers tape. Antenna’s should be mounted as far away from metal plates or bars as possible to avoid RF energy being reflected back or blocked on the other side of the metal. An antenna will not work inside a metal box. Mounting to drywall between studs, ceiling tiles, brick, or concrete is very common.

#### 418 MHZ TRANSMISSION DISTANCE

Transmission distance performance will vary based on environment and antenna orientation. 100 feet is the maximum that can be expected if there are no obstructions (Open Air). In general, each obstruction will half the expected transmission distance. Obstructions include but are not limited to; walls, partitions, floors, ceilings, doors, tinted glass, the ground, many people, vehicles, foliage, rain, snow and fog. Metal (solid or screen) blocks the RF signal preventing propagation but also can bounce the signal around the potential obstacle. Wood, drywall, plaster, brick, and concrete attenuates the signal but will let it pass (if it’s not too thick) at a reduced signal strength. Anything that holds water absorbs the signal to the point of blockage like rain, fog, people, ground, dense foliage etc. Elevator shafts and stairwells usually block RF signals.

#### 900 MHZ DIPOLE AND WHIP ANTENNA MOUNTING

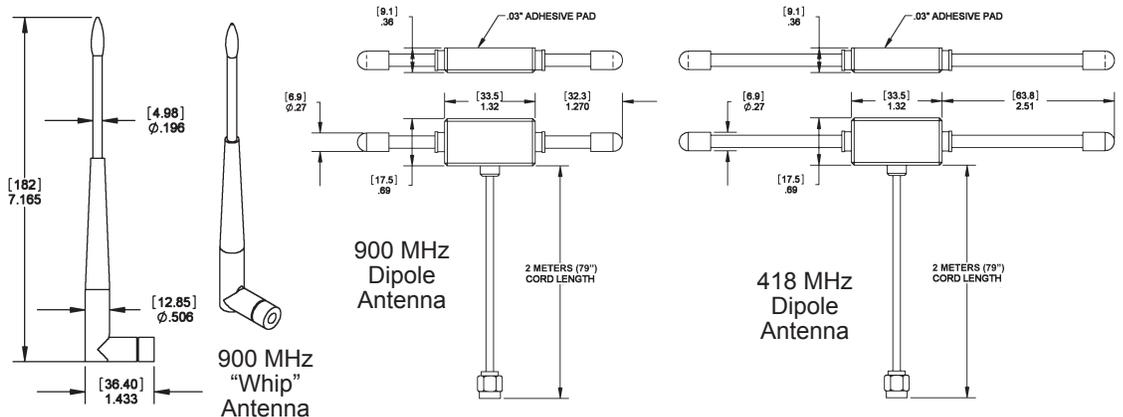
To mount the 900 MHz Dipole Antenna, peel off the protective film from the adhesive pad and stick the antenna to a wall or other non-metallic support so that antenna is vertical for best reception. A wooden or plastic furring strip or PVC pipe attached to a ceiling beam w/U bolts makes a great mount. The antenna may be hung from any ceiling fixture using fiber or plastic twine, do not use wire. Do not use perforated metal strapping, commonly called plumbers tape. Antenna’s should be mounted as far away from metal plates or bars as possible to avoid RF energy being reflected back or blocked on the other side of the metal. An antenna will not work inside a metal box. Mounting to drywall between studs, ceiling tiles, brick, or concrete is very common.

To mount the 900 MHz Whip Antenna just screw it into the receiver SMA connector labeled 900 MHz. Swivel the antenna at it’s base so that it sits up or down vertically. It should never be mounted inside a metal enclosure. If this is unavoidable then an 900 MHz Dipole Extensible antenna will be required.

#### 900 MHZ TRANSMISSION DISTANCE

Transmission distance performance will vary based on environment and antenna orientation. 1,000 feet is the maximum that can be expected if there are no obstructions (Open Air). In general, each obstruction will half the expected transmission distance. Obstructions include but are not limited to; walls, partitions, floors, ceilings, doors, tinted glass, the ground, many people, vehicles, foliage, rain, snow and fog. Metal (solid or screen) blocks the RF signal preventing propagation but also can bounce the signal around the potential obstacle. Wood, drywall, plaster, brick, and concrete attenuates the signal

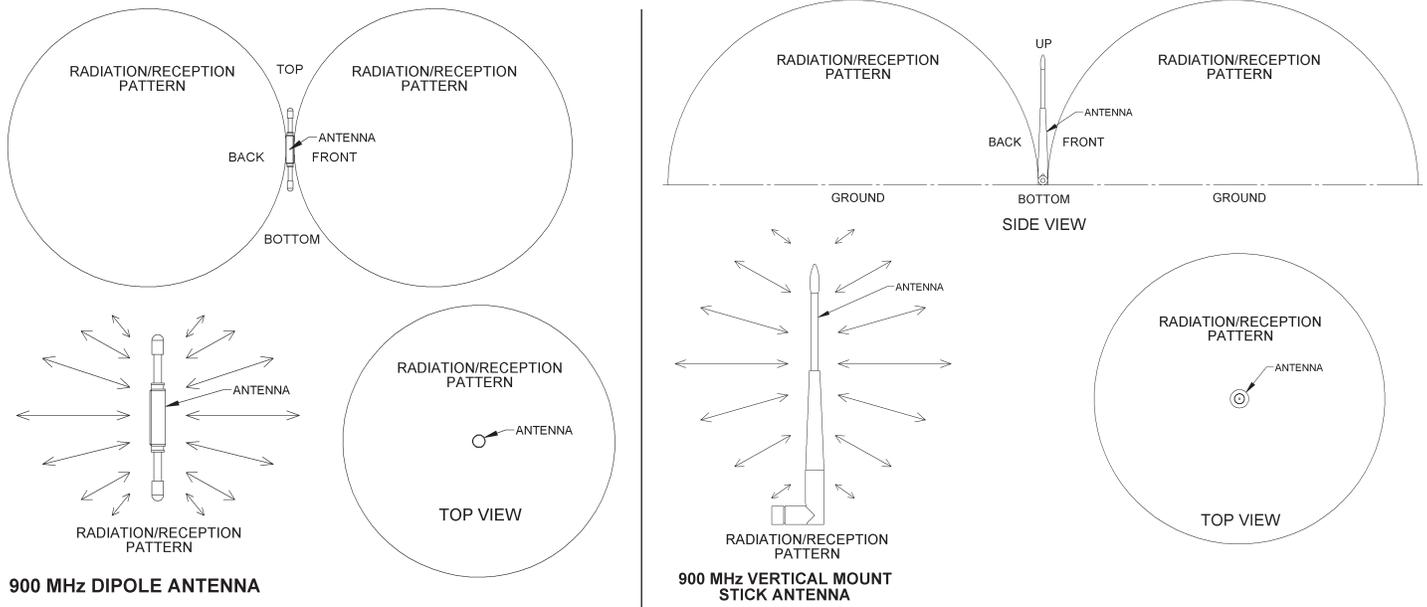
but will let it pass (if it’s not too thick) at a reduced signal strength. Anything that holds water absorbs the signal to the point of blockage like rain, fog, people, ground, dense foliage etc. Elevator shafts and stairwells usually block RF signals.



**Note:** The Dipole antennas above are displayed horizontally to show dimensions but they should be mounted vertically for best reception.

Specifications subject to change without notice.

### Antenna Patterns



### Repeater Diagnostics

#### Normal Operation:

The red light of the Repeater should be on indicating good power.

The red light of the Repeater will blink to indicate a received message and successful transmission.

The red light of the Repeater should blink on every transmission. Each sensor transmits every 20 seconds.

#### Possible Problem:

Repeater power LED does not light.

#### Possible Solution:

- Check for proper power to the repeater.

Transmissions are not getting through.

- Make sure that the repeater is within range of the transmitters and the associated 900 MHz Receiver.

- Make sure that the associated transmitter is transmitting (the LED will flash about once every 20 seconds when it transmits). If not, replace the batteries. Check that the Repeater's associated 900 MHz Receiver is receiving the transmissions (its LED will blink right after the transmitter LED if it receives that transmission.) If it is not receiving the transmissions, move it closer to the Repeater or reposition the antenna for maximum reception as described above.

**Note:** For additional information on BAPI's Wireless System, see the installation and operation sheet for the complete wireless system (27986\_Wireless\_System\_Ins.pdf). This document is available on our website at [www.bapihvac.com](http://www.bapihvac.com).

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