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RKI INSTRUMENTS 71-0566 AirLink 9900 NXP Signal Repeater User Manual

**AirLink 9900 NXP
Signal Repeater
Operator's Manual**

Contents

Product Warranty

RKI Instruments, Inc. warrants gas alarm equipment sold by us to be free from defects in materials, workmanship, and performance for a period of one year from the date of shipment from RKI Instruments, Inc. Any parts found defective within that period will be repaired or replaced, at our option, free of charge. This warranty does not apply to those items which by their nature are subject to deterioration or consumption in normal service, and which must be cleaned, repaired, or replaced on a routine basis. Examples of such items are:

a) Absorbent cartridges
b) Pump diaphragms and valves
c) Fuses
d) Batteries
e) Filter elements

Warranty is voided by abuse including mechanical damage, alteration, rough handling, or repair procedures not in accordance with the operator's manual. This warranty indicates the full extent of our liability, and we are not responsible for removal or replacement costs, local repair costs, transportation costs, or contingent expenses incurred without our prior approval.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY AND ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESSED OR IMPLIED, AND ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF RKI INSTRUMENTS, INC. INCLUDING BUT NOT LIMITED TO, THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL RKI INSTRUMENTS, INC. BE LIABLE FOR INDIRECT, INCIDENTAL, OR CONSEQUENTIAL LOSS OR DAMAGE OF ANY KIND CONNECTED WITH THE USE OF ITS PRODUCTS OR FAILURE OF ITS PRODUCTS TO FUNCTION OR OPERATE PROPERLY.

This warranty covers instruments and parts sold to users by authorized distributors, dealers, and representatives as appointed by RKI Instruments, Inc.

We do not assume indemnification for any accident or damage caused by the operation of this gas monitor, and our warranty is limited to the replacement of parts or our complete goods.

Overview

The AirLink 9900 WireFree signal repeater is designed to receive the transmission from an RKI WireFree sensor assembly and repeat it to the WireFree monitor(s) on your site. The AirLink 9900 features non-intrusive magnetic switches that allow for complete system configuration to be performed in the field, without breaking the enclosure's seal. Non-intrusive interface with the AirLink 9900 is made possible by the use of the magnetic tool

included in the purchase of the device. The AirLink 9900 display screen always shows the current state of communication with the sensor assemblies and receiving monitor devices.
Read this document before the initial operation of the product.

WARNING: The AirLink 9900 is a radio signal repeater used to increase the distance between AirLink sensor assemblies and the receiving AirLink monitor. The AirLink 9900 does not detect or display the detected gas levels in the environment.

A site survey is required in order to determine the best placement and quantity of repeater assemblies that may be required. Improper installation can lead to inconsistent communication between the AirLink sensor assembly and AirLink monitor which could result in personal injury or loss of life.

Specifications

Operating Power	12 to 35 VDC
Current Draw	150 mA maximum
Operating Temperature	-20°C to 54°C (-4°F to 129°F)
Operating Humidity	0 – 98% relative humidity, non-condensing
Radio	• 2.4 GHz ISM, 100 mW or • 900 MHz, 200 mW
Dimensions	6.44" (W) x 17" (H) x 6.56" (D)
Weight	5 lbs.
Enclosure Material	Polycarbonate with clear lid

External Description
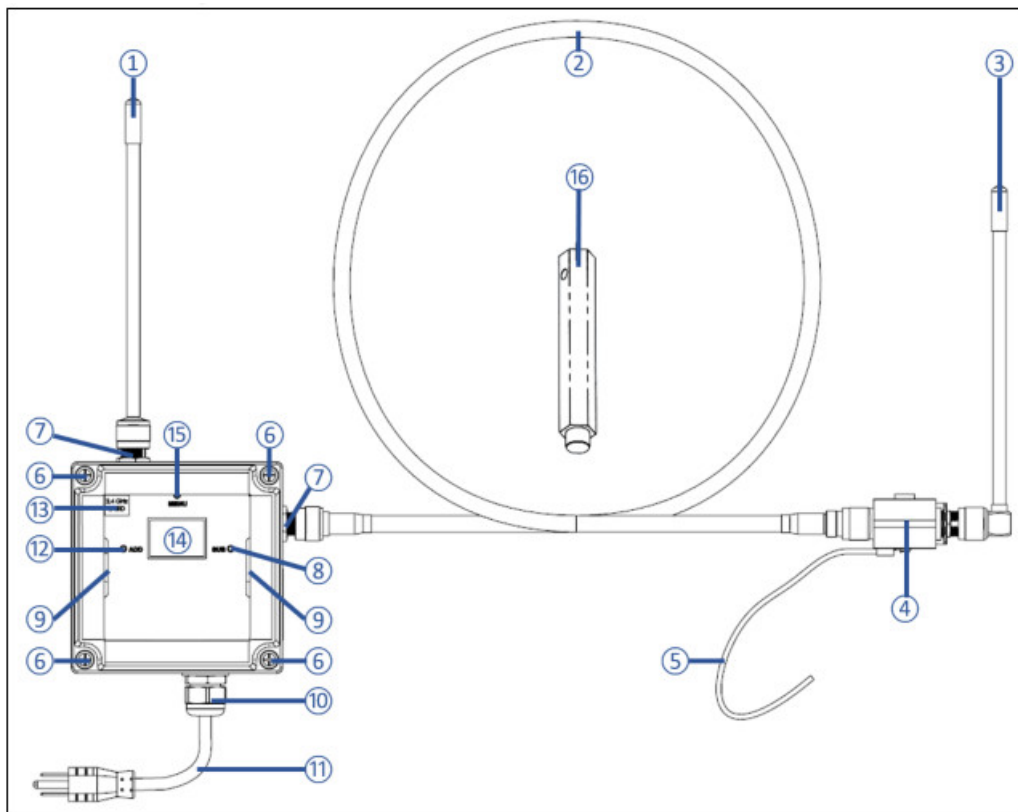
Figure 1: External Component Location

1	Receiving antenna	9	Front panel handles (2X)
2	10-foot extension cable	10	Power cord grip
3	Transmitting antenna	11	Power cord (for AC version)
4	Lightning surge protector	12	ADD button
5	Surge protector ground wire	13	Radio type label
6	Enclosure lid screws (4X)	14	Display screen
7	Antenna fitting (2X)	15	MENU button
8	SUB button	16	Magnetic tool

Internal Description
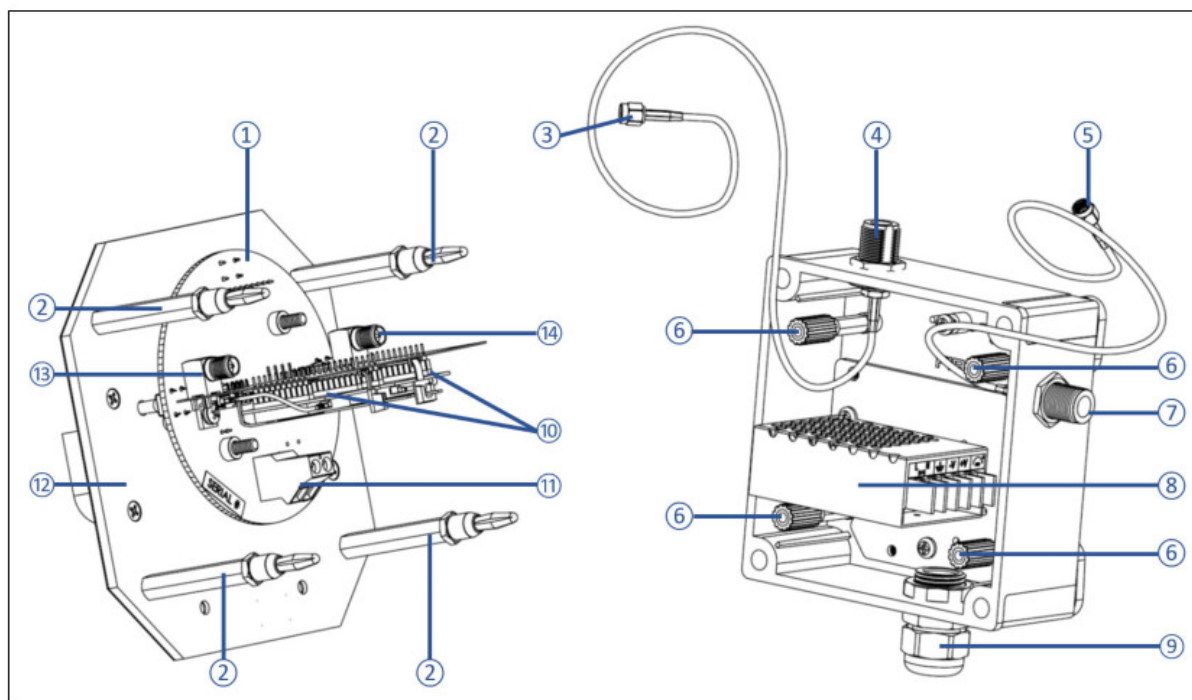
Figure 2: Internal Component Location

1	Electronics assembly	8	AC power supply (optional)
2	Mounting post (4X)	9	Power cord grip
3	Receiving antenna jack	10	Radio module (2X)
4	Receiving antenna fitting	11	Power terminal block
5	Transmitting antenna jack	12	Faceplate kit
6	Mounting socket (4X)	13	Transmitting antenna socket
7	Transmitting antenna fitting	14	Receiving antenna socket

Exploded Diagram
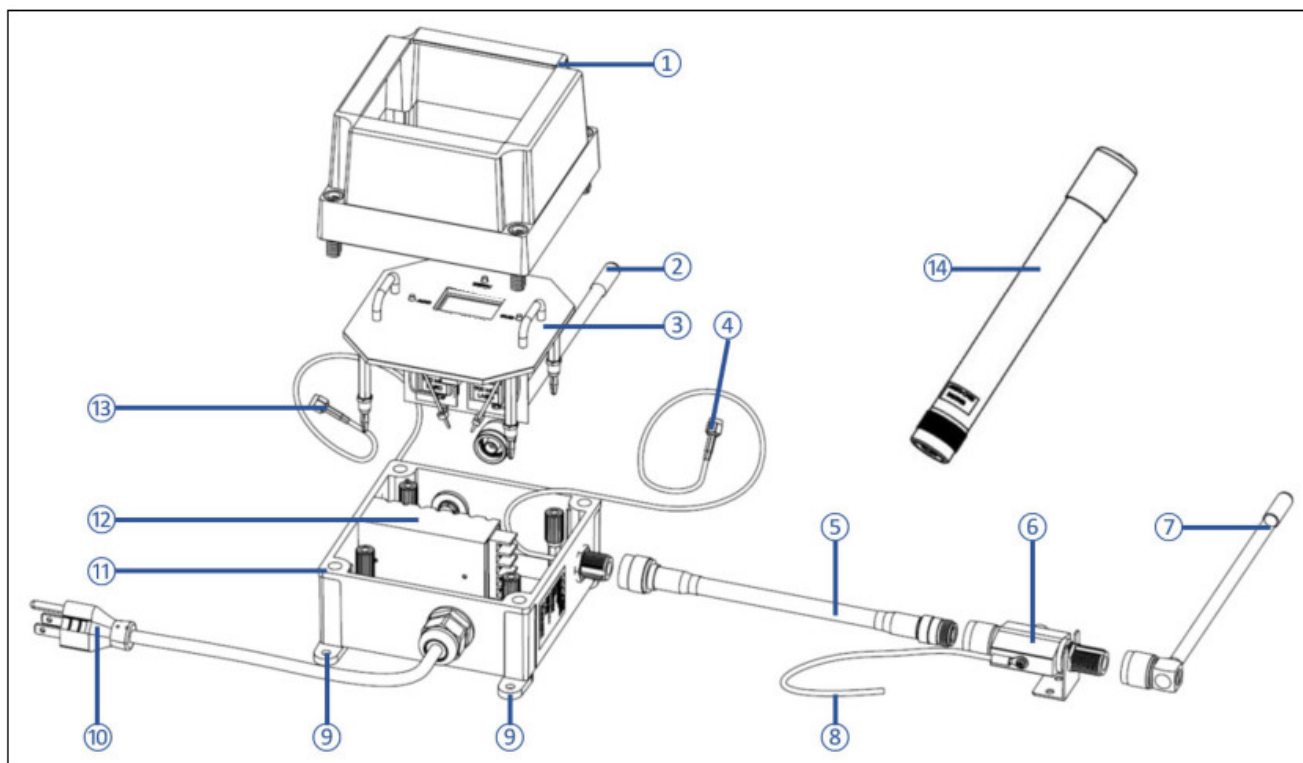
Figure 3: Exploded Diagram

1	Enclosure lid	8	Lightning surge protector grou
2	900 MHz receiving antenna plug	9	Enclosure mounting foot (4X)
3	Faceplate and electronics assembly	10	AC power cord (optional)
4	Transmitting antenna plug	11	Enclosure base
5	10-foot antenna extension cable	12	AC power supply (optional)
6	Lightning surge protector	13	Receiving antenna plug
7	900 MHz transmitting antenna	14	2.4 GHz antenna (replaces ite

Installation

This section describes procedures to mount the AirLink 9900 in the monitoring environment and wire the AirLink 9900.

Mounting the AirLink 9900

The primary purpose of the AirLink 9900 is to provide an increase in distance between an AirLink sensor assembly and an AirLink monitor. Proper placement of the repeater is paramount to achieving this goal.

These installation instructions provide only basic guidelines relating to the properties of radio communication and the effects of environmental conditions on the AirLink 9900. Repeater placement should be determined in consultation with the site safety personnel, as well as those knowledgeable of: (1) the site/facility where the equipment is being installed and (2) the potentially present radio interference sources. RKI strongly recommends that a sight survey be performed to determine the best placement of AirLink 9900 repeater devices.

1. In general, consider the following when you select a mounting site:

   • The receiving and transmitting antennas should be mounted at least 10 feet apart.

   • Avoid installing the antennas in a location surrounded by obstructions such as trees, buildings, or other such obstacles.

• Consider accessibility for required maintenance.

2. Select a mounting location and installation hardware. Mounting to a concrete or steel structure is recommended to minimize vibration and moisture. Use a maximum #8 bolt screw, flat washers, Grade 5 material, and corrosion protection like paint, galvanization, or zinc plating to mount the enclosure.

3. Use the included hardware to mount the transmitting antenna.

Wiring DC Power

NOTE: The AirLink 9900 is configured for AC or DC operation, depending on how it is ordered. If you are using AC power as the primary power source, go to the next section, "Wiring AC Power".

The AirLink 9900 requires +12 to +35 Volts of wired DC to operate. The recommended wire size is anything between 26 AWG and 14 AWG.

CAUTION: The internal components can be static sensitive. Use caution when opening the enclosure and handling internal components.

CAUTION: Make sure the power source is off before beginning the wiring procedure.

CAUTION: DO NOT use any metal objects or tools to remove the terminal board from the internal system.

1. Unscrew the captive screws from the enclosure base. Remove the enclosure lid and set it aside.

2. Grab the handles on the front panel and pull the internal system out of the enclosure. It can rest on the edge of the enclosure.

   NOTE: Disconnecting both antenna cable connections from the radio board will allow for the complete removal of the internal system from the device enclosure. Disconnecting the internal system may provide ease in accessing the control board terminals for wiring. If this step is performed, it is essential that all connections are rejoined before returning the internal system back into the enclosure. WARNING: Use appropriate construction techniques to maintain the explosion-proof classification of the assembly.

3. Feed the power wires through the AirLink 9900's power hub and into the enclosure.

4. Locate the power terminal block on the control board and complete the following (see Figure 4).
   • Connect the power (RED) wire to the +12 to +35 VDC terminal.
   • Connect the ground (BLACK) wire to the GND terminal.

5. Route the wires to the DC power source and complete the following.
   • Connect the power (RED) wire to the + terminal.
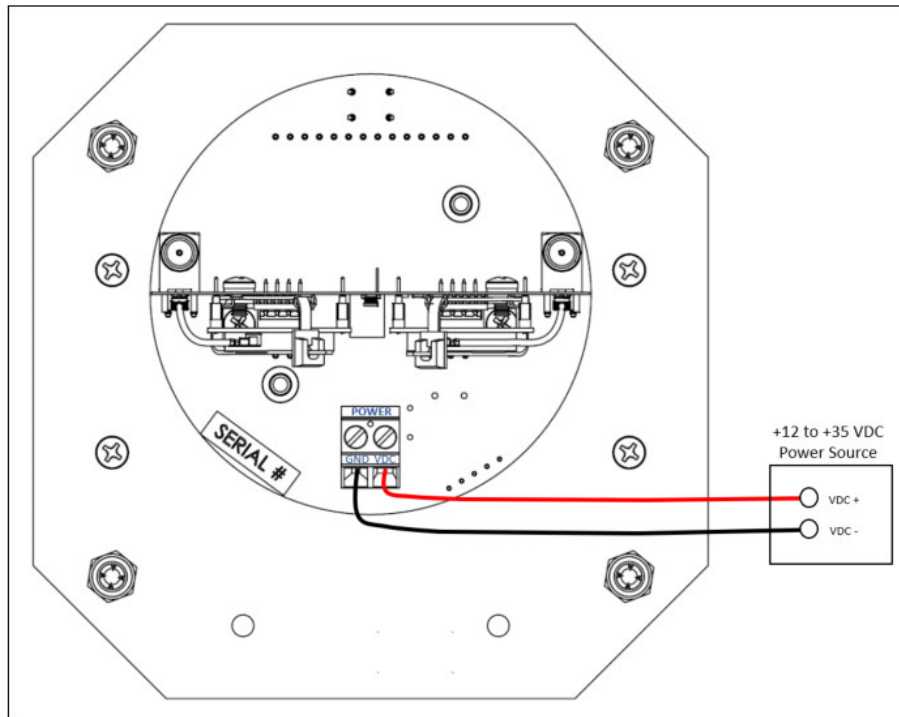   • Connect the ground (BLACK) wire to the – terminal.

Figure 4: DC Power Wiring

Wiring AC Power

Figure 4: DC Power Wiring

NOTE: The AirLink 9900 is configured for AC or DC operation, depending on how it is ordered. If you are using DC power as the primary power source, go to the previous section, "Wiring DC Power".

1. Plug the AC power cord into a power outlet.

Closing the Enclosure

1. Place the internal system back into the enclosure, matching each mounting post to its corresponding eyelet anchored within the base of the enclosure.
2. Using the front panel handles, gently push to seat the internal system into the mounting posts.
   NOTE: The front panel handles on the AirLink 9900 function ONLY as thumb-holds for ease in removal of the internal system from the base of the enclosure.
3. Verify that the sealing ring, seated at the opening of the device enclosure, is correctly in place.
4. Reinstall the enclosure lid by tightly screwing the captive screws into the enclosure base.

WARNING: When securing the lid onto the device, tighten the enclosure lid by hand ONLY. Overtightening of the lid by use of hand tools could result in damage to the O-ring, potentially compromising the moisture seal, resulting in an unsafe environment.
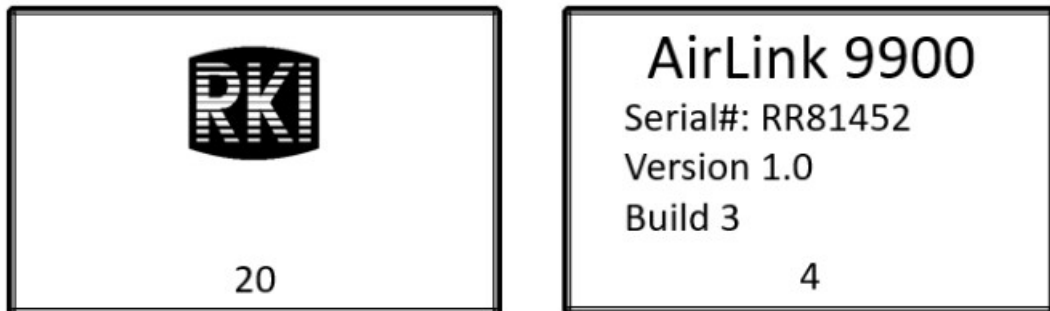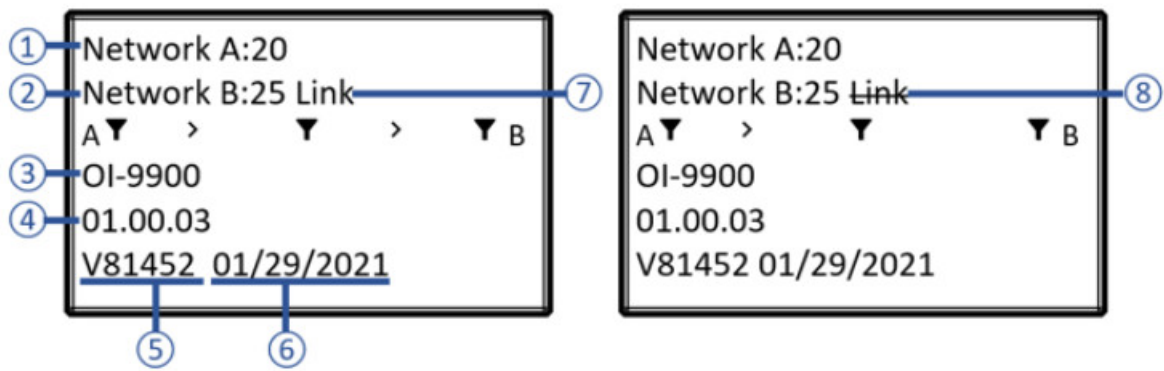AirLink 9900 · 11

Start-Up

This section describes procedures to start up the AirLink 9900 and place the AirLink 9900 into normal operation.

1. Complete the installation procedures described earlier in this manual.

2. Verify that the power wiring is correct and secure.

3. Turn on the power source.

4. Verify that the controller is on and operating properly. Refer to the controller operator's manual.

5. The AirLink 9900 automatically powers on and enters a 20-second startup period.

```
┌─────────────────────────┐   ┌─────────────────────────┐
│                         │   │    AirLink 9900         │
│         RKI             │   │  Serial#: RR81452       │
│                         │   │  Version 1.0            │
│                         │   │  Build 3                │
│          20             │   │                   4     │
└─────────────────────────┘   └─────────────────────────┘
```

6. At the end of the startup, the AirLink 9900 is in Normal Operating Mode.

```
①→ Network A:20                      Network A:20
②→ Network B:25 Link ──────── ⑦     Network B:25 Link ──────── ⑧
   A ▼    >    ▼    >   ▼ B          A ▼   >    ▼         ▼ B
③→ OI-9900                           OI-9900
④→ 01.00.03                          01.00.03
   V81452 01/29/2021                 V81452 01/29/2021
      ⑤        ⑥
```

1	Network ID A (input)	
2	Network ID B (output)	
3	Product model	
4	Firmware version	
5	Product serial number	
6	Date of manufacture	
7	Link status indicator – able to communicate with the primary monitor	
8	Link status indicator – unable to communicate with the primary monitor	

Operation

WARNING: Do not remove the enclosure lid while the circuits are energized unless the area is determined to be non-hazardous. Keep the enclosure lid tightly closed during operation.

Normal Operating Mode

During Normal Operating Mode, the AirLink 9900 continuously shows the reception of radio signals from WireFree sensor assemblies and the status of communication with the receiving WireFree monitor(s). The display, when in Normal Operating Mode, appears as shown below.

1	Network ID A (input)	5	Product serial number
2	Network ID B (output)	6	Date of manufacture
3	Product model	7	Link status indicator – able to communicate with the primary monit
4	Firmware version	8	Link status indicator – unable to communicate with the primary monit

In the event of another Primary Monitor on the A network the following screen will appear:

There is another
Primary Monitor
Hit ADD to Change
Network ID.

Pressing the ADD button takes you to the "Setting Network ID A" screen where you can change to a network ID that does not have a Primary Monitor present.

Magnetic Switch Operation

Use the provided magnet to actuate the AirLink 9900's buttons without having to remove the enclosure lid. Touch the magnet to the outer edge of the enclosure lid near the button you want to actuate. Tapping the enclosure lid is the same and pressing and releasing the button. Holding the magnet against the enclosure lid is the same as pressing and holding the button.
Touch magnet here to activate MENU button
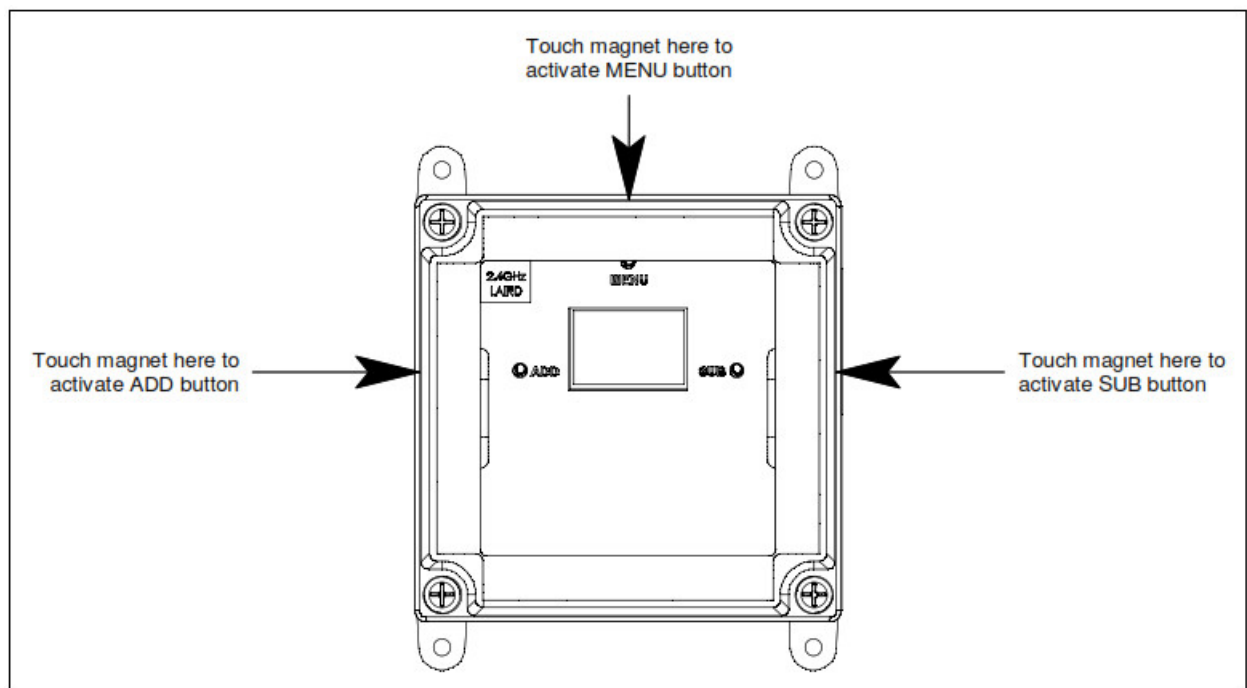
Powering the Device
The AirLink 9900 turns on and off with the application and removal of AC or DC power.

Product Settings and Configuration

The Product Settings and Configuration menu allow the end-user to tailor the device settings to meet their required specifications and/or site conditions. The Product Settings and Configuration menu consist of the following screens:

- Network ID
- Display Contrast

Entering the Product Settings and Configuration Menu

1. From Normal Operating Mode, press and hold MENU for 6 seconds.

NOTE: After 5 minutes of no interaction with the device, the unit will automatically return to normal operating mode.

Setting the Network ID

The Network ID is used to synchronize the communication between the repeater, the monitor, and the sensor assembly.

- There are 52 networks available with the 900 MHz radio.
- There are 78 networks available with the 2.4 GHz radio.
- The "A" network receives transmissions from the Sensor Assembly.
- The "B" network transmits the received transmissions onto the receiving monitor.
- The "A" network should be set to a Network ID value that is at least 5 higher than the "B" Network ID value.

NOTE:

The "A" network is configured to be a Primary Monitor and can not be changed. Secondary monitors can be configured on the same Network ID as the "A" network to display Sensor Assembly readings and activate alarms if desired.

The repeater will automatically transmit ANY received transmission on the "A" network and can not be configured to only see a certain range of addresses.

1. If necessary, enter the Product Settings and Configuration Menu by pressing and holding MENU for 6 seconds.
2. Use the ADD and SUB buttons to adjust the Network ID A.

3. Press and release MENU.
4. Use the ADD and SUB buttons to adjust the Network ID B.
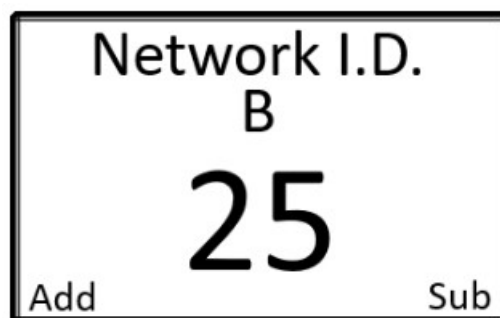
5. Press and release MENU.

Setting the Display Contrast

The display screen contrast is the difference in luminance or color that makes the displayed images distinguishable. Due to varying external elements, such as extreme sunlight, the brightness of the display screen may need to be adjusted for optimum viewing. The factory default setting on the AirLink 9900 for the display

screen contrast is 29, approximately 45% of the contrast scale. The contrast setting ranges from 1 to 64.

NOTE:
Setting the contrast too low will cause the display image to become faint or indistinguishable, especially when the unit is located in areas with full sun. The resulting field of view could be misinterpreted as an error within the device. Be sure to verify that the selected contractor is within an appropriate range of viewing.

1. If necessary, enter the Product Settings and Configuration Menu by pressing and holding MENU for 6 seconds.

2. Press and release MENU until the Contrast screen appears.

3. Use the ADD and SUB buttons to adjust the contrast.

4. Press and release MENU to save the setting and return to Normal Operating Mode.

Parts List

Part Number	Description
82-0101RK	Magnetic wand
ZAN-2.4RIGID-R	Antenna, rigid dipole, 2.4 GHz, N-male, right-angle
ZAN-2.4RIGID-S	Antenna, rigid dipole, 2.4 GHz, N-male, straight
ZAN-900-FLEX-R	Antenna, flexible dipole, 900 MHz, N-male, right-angle
ZAN-900-FLEX-S	Antenna, flexible dipole, 900 MHz, N-male, straight

Documents / Resources

RKI INSTRUMENTS 71-0566 AirLink 9900 NXP Signal Repeater [pdf] User Manual
71-0566, AirLink 9900 NXP, Signal Repeater, 71-0566 AirLink 9900 NXP Signal Repeater