# AirLink 7032 Gas Monitor
## Operator's Manual

*Part Number: 71-0560*

*Revision: P3*

*Released: 1/17/24*

**RKI Instruments, Inc.**
**www.rkiinstruments.com**

# Product Warranty

RKI Instruments, Inc. (Manufacturer) warrants its products to be free of defects in workmanship and materials—under normal use and service—for one year from the date of purchase from the manufacturer or from the product's authorized reseller.

The manufacturer is not liable (under this warranty) if its testing and examination disclose that the alleged defect in the product does not exist or was caused by the purchaser's (or any third party's) misuse, neglect, or improper installation, testing or calibrations. Any unauthorized attempt to repair or modify the product, or any other cause of damage beyond the range of the intended use, including damage by fire, lightning, water damage or other hazard, voids liability of the manufacturer.

Any repaired or replaced product or part has either a 90-day warranty or the remainder of the initial warranty period (whichever is longer).

# Table of Contents

# Chapter 1: Introduction

## Overview

This chapter briefly describes the AirLink 7032 Gas Monitor. This chapter also describes the *AirLink 7032 Gas Monitor Operator's Manual* (this document). Table 1 at the end of this chapter lists the specifications for the AirLink 7032.

## About the AirLink 7032 Gas Monitor

The AirLink 7032 is a hybrid monitor and data logger that supports either 32 AirLink sensor units or 64 AirLink sensor units depending on the configuration ordered. Either configuration can also be set up for 4, wired 4-20 mA input sensors in place of 4 AirLink sensors.

All channels can be configured to detect AirLink gas sensor assemblies. If desired, the last four channels (29-32 for 32-channel versions, and 60-64 for 64-channel versions) can be configured to accept a 4-20 mA signal. By default, all channels except the last four are configured for AirLink sensor assemblies. The last four channels are configured for wired sensor assemblies. Any channel can be turned "off", and any channel can be configured to any valid AirLink address, 1-255.

There are four 5 Amp relays with 4 Amp fuses. The fourth relay may be configured as a Fault relay. This Fault relay will activate if any Fault is generated by the monitor or if any sensor that the monitor is configured to monitor goes into Fault. The Fault relay is removed from any further configurable options from Channel Setup—leaving only three relays for each channel. All relays can be configured to be either latching or auto resetting. The relays can be configured with different set points for each channel.

An optional strobe and/or horn can be ordered. The strobe is installed on the top of the housing and is wired into the first relay. The horn is installed on the bottom of the housing and is wired into the second relay.

All relays have a 10% of value of hysteresis on the set points. This prevents the relays from rapidly switching on and off during a potentially jumpy gas sensor reading. Once the threshold value of a relay is reached, the relay is activated and the appropriate relay number is highlighted for the affected channel. The gas reading must decreases to 90% of the relay value to deactivate.

# About this Manual

The *AirLink 7032 Gas Monitor Operator's Manual* uses the following conventions for notes, cautions, and warnings:

**NOTE:** Describes additional or critical information.

***CAUTION:*** *Describes potential damage to equipment.*

***WARNING:*** ***Describes potential danger that can result in injury or death.***

⚠ Caution: refer to accompanying documentation

~ Vac (AC voltage)

⎓ Vdc (DC voltage)

# Specifications

Table 1 lists specifications for the AirLink 7032.

**Table 1: AirLink 7032 Specifications**

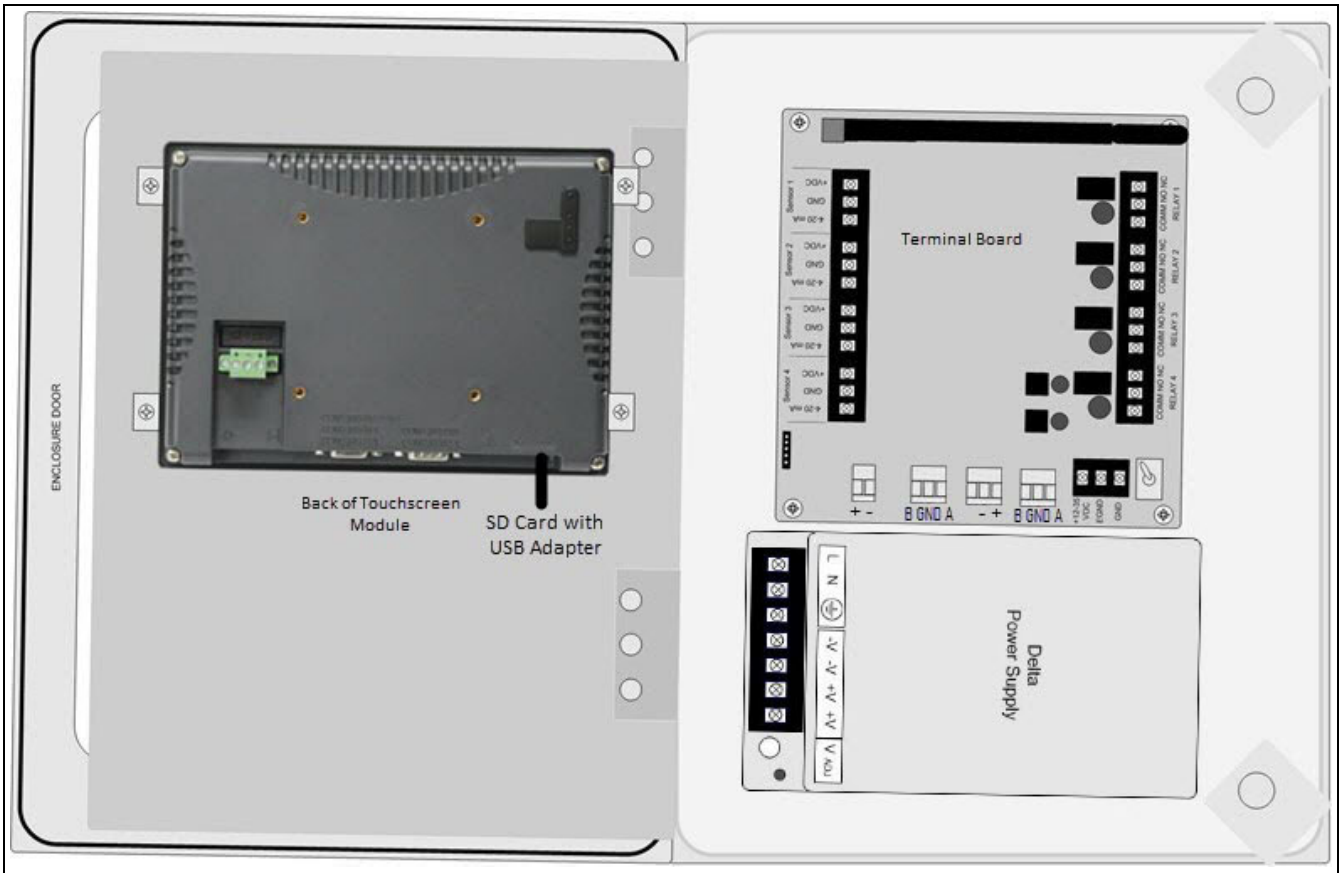
| | |
|---|---|
| **Input Power** | 120/240V ~<br>OR<br>22 - 26 V ⎓ |
| **Current Draw** | 300 mA max at 24 VDC (monitor without sensor assemblies)<br>3A max (with sensor assemblies) |
| **Operating Temperature** | -20°F to 122°F (-28.9°C to 50°C) |

**Table 1: AirLink 7032 Specifications**

| | |
|---|---|
| **Input Signal** | 32-channel AirLink 7032<br>• Up to 32 WireFree sensor assemblies<br>OR<br>• Up to 28 WireFree sensor assemblies and up to 4 4-20 mA input sensor assemblies<br>64-channel AirLink 7032<br>• Up to 64 WireFree sensor assemblies<br>OR<br>• Up to 60 WireFree sensor assemblies and up to 4 4-20 mA input sensor assemblies |
| **Output** | • RS-485 Modbus<br>• Datalogging to USB drive |
| **Construction (housing)** | Fiberglass with clear window (NEMA 4) |
| **Dimensions** | 14.97 in. H x 12.17 in. W x 6.56 in. D<br>(38.02 cm H x 30.91 cm W x 16.66 cm D) |
| **Weight** | 12 lbs. |
| **Mounting** | 4 mounting feet (8” W x 14.38” T); 1/4” diameter max mounting bolt/screw size |
| **Display** | 7” resistive touchscreen |
| **Relays** | • 4 relays with 4A fuses<br>• SPDT, Form C (common, normally open, and normally closed contacts) |
| **Radio Options** | • 2.4 GHz, ISM, 125 mW<br>OR<br>• 900 MHz, 200 mW |
| **Standard Accessory** | • Operator’s manual (this document)<br>• SD card with USB adapter |
| **Optional Accessories** | • Strobe<br>• Horn |

# Chapter 2: Internal Components

The inside of the AirLink 7032 contains the terminal board for wiring connections and the AC power supply (for AC versions). The back of the touchscreen module is visible and has an SD card with USB adapter installed on the back for datalogging.




Note: Delta power supply only included with AC-powered version.

**Figure 1: Internal Components**

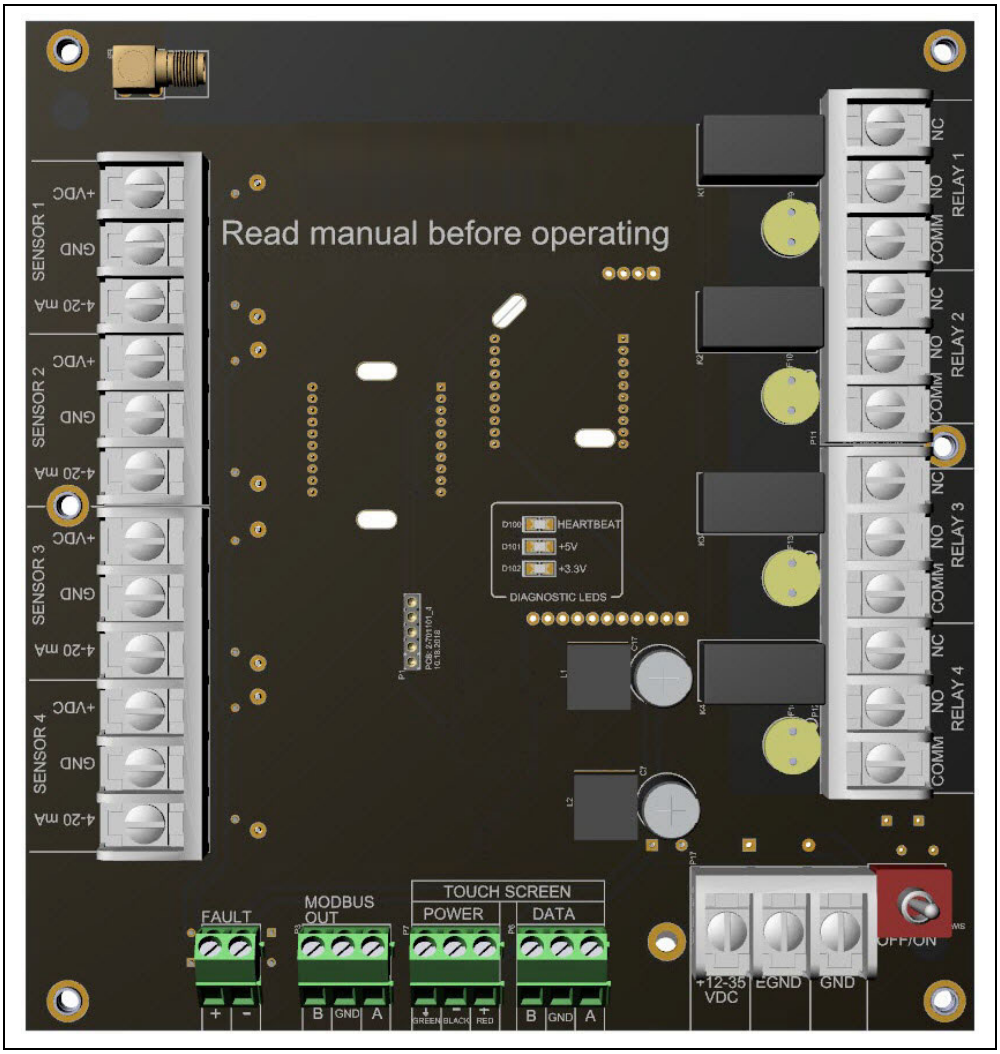



**Figure 2: Terminal Board**

# Chapter 3: Installation

## Mounting the AirLink 7032 Gas Monitor

1. Select the mounting site. When you select the mounting site, consider the following factors:
   - Is an AC or DC power source available?
   - Is a vertical surface available to mount the AirLink 7032?
   - Is there enough room to open the housing door and make wiring connections?
   - Are the display screen and status lights visible?
2. Close and latch the housing door.
3. Prepare the selected mounting site as required to mount the AirLink 7032. It should be mounted at eye level (4 1/2 to 5 feet from the floor). Refer to Figure 3 for the outline and mounting dimensions.
4. Position the monitor on the vertical mounting surface.
5. Insert maximum 1/4” bolts or screws through the slots in the mounting feet at each corner of the housing to secure the housing to the mounting surface.

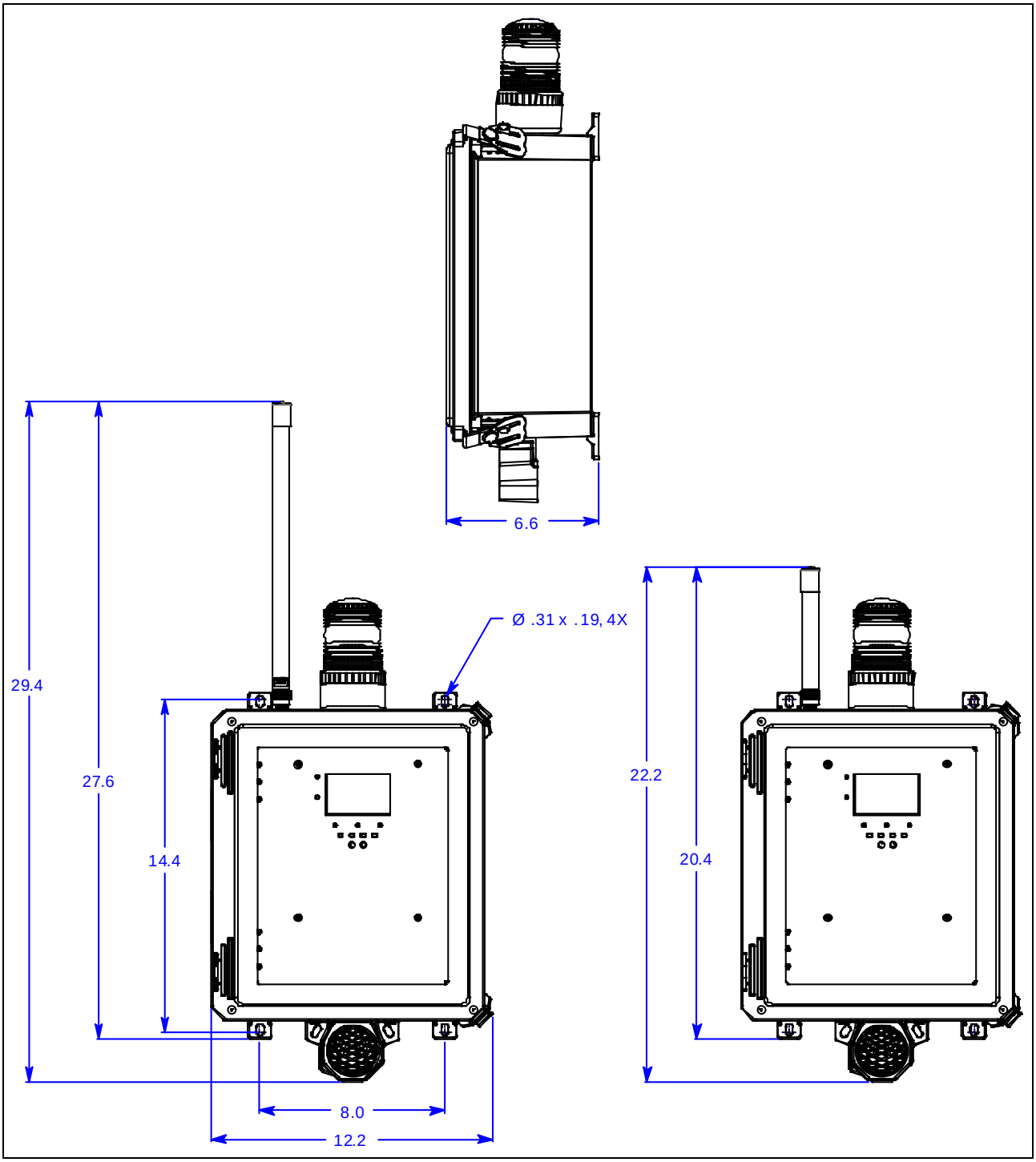



**Figure 3: Outline and Mounting Dimensions**

# Wiring the AirLink 7032 Gas Monitor

This section describes procedures for DC power source wiring, AC power source wiring, Modbus out wiring, fault indicator wiring, sensor connection, and relay wiring.

The following wiring connections must be made before starting up the AirLink 7032.

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

***WARNING:*** ***Make all connections to the AirLink 7032 before you plug in or turn on the AC or DC power source. Before you make any wiring adjustments, always verify that all power sources are not live.***

## *Factory Wiring*

Factory wiring for the AirLink 7032 is shown below.

**NOTE:** The power supply is only installed in AC versions. An AC power cord is only prewired to the power supply in AC versions ordered with a power cord.

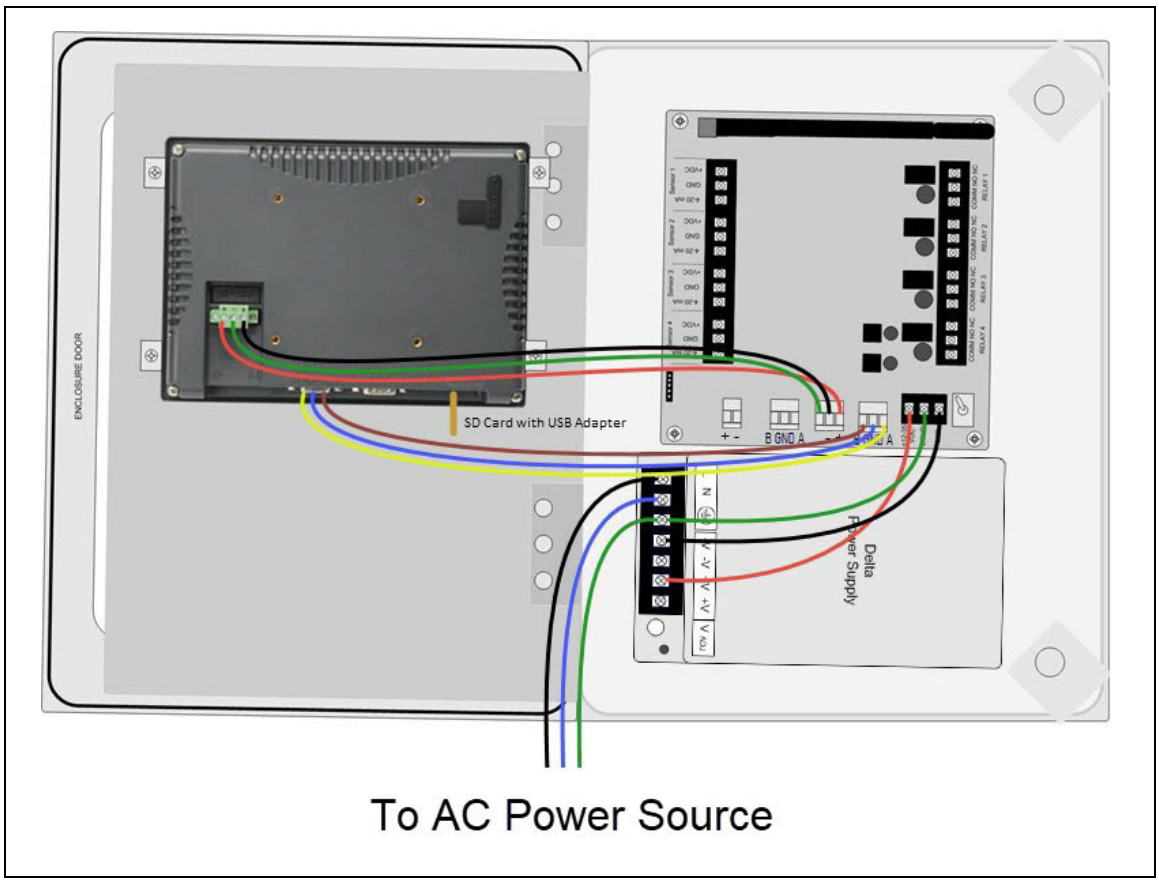



**Figure 4: Factory Wiring**

# Connecting a DC Power Source

**NOTE:** The AirLink 7032 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, “Connecting an AC Power Source”.

Provide a clean and stable 22-26 VDC. Failure to do so may cause the unit (and any wired sensors that are connected to the unit) to not operate properly.

Voltage spikes higher than 26 VDC may damage the unit.

1. Open the enclosure box to expose the Front Panel.
2. Unscrew the two thumb screws on the Front Panel.
3. Open the Front Panel so that the Terminal Board is exposed.
4. Locate the Power Terminal and connect the DC-live wire (red) to the terminal marked “+12-35 VDC”.
5. Connect the DC-ground wire (black) to the terminal marked “GND”.
6. If desired, connect an Earth Ground wire (green) to the terminal marked “EGND” (required for surge suppression).

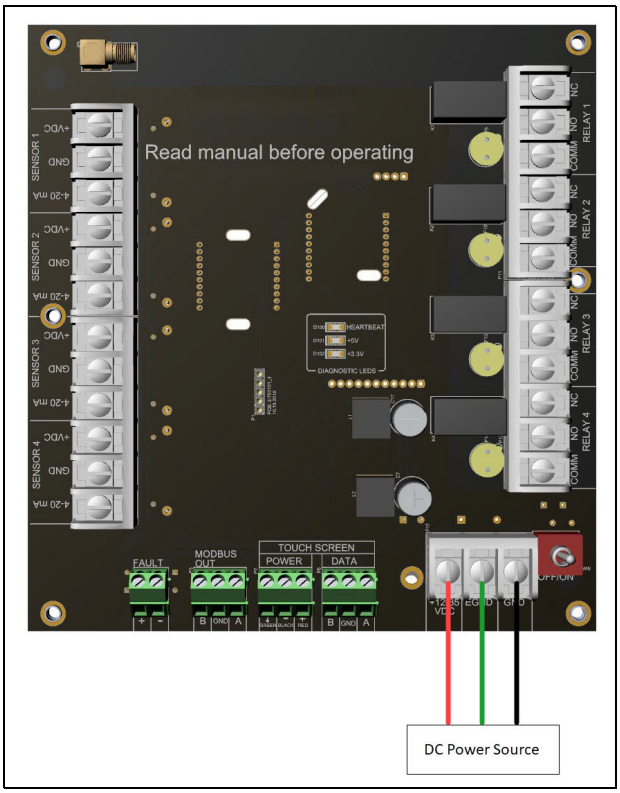



**Figure 5: DC Wiring**

7. Close the Front Panel.
8. Screw in the thumb-screws.

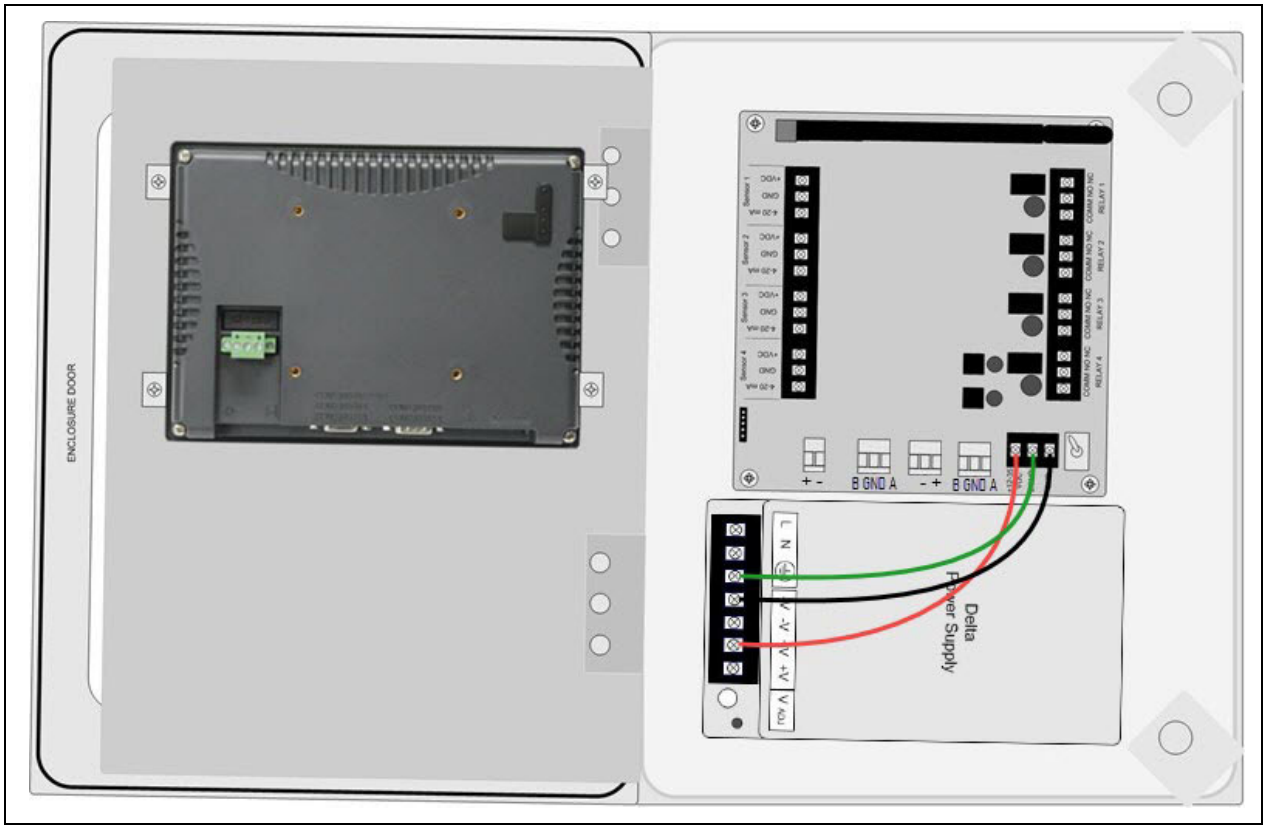
9. Close the enclosure box.
10. Clamp down the enclosure latches.

## Connecting an AC Power Source

**NOTE:** The AirLink 7032 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, “Connecting a DC Power Source”.

***WARNING: Verify that the power source is unplugged or turned off before you continue with this procedure.***

1. Open the enclosure box to expose the Front Panel.
2. Unscrew the two thumb-screws on the Front Panel.
3. Open the Front Panel so that the AC (Delta) Power Supply is exposed.
4. The power supply is factory-wired to the Terminal Board.




5. For versions that came with a pre-wired AC line cord: there are three wires (black, white and green) pre-wired from the Delta power supply terminals “L” (AC Load IN), “N” (AC Neutral IN), and “EG” (Chassis GND or Earth GND). This set of wires will be used to plug into an AC power outlet ONCE ALL WIRING CONFIGURATIONS ARE COMPLETE.

6. For versions that did not come with a pre-wired AC line cord:
   - Connect a line wire from the AC power source to the power supply's "L" terminal.
   - Connect a neutral wire from the AC power source to the power supply's "N" terminal.
   - Connect a ground wire from the AC power source to the power supply's "EG" terminal.

**NOTE:** If the AirLink 7032 was not ordered with any housing holes, at least one hole will have to be drilled to bring in AC power.

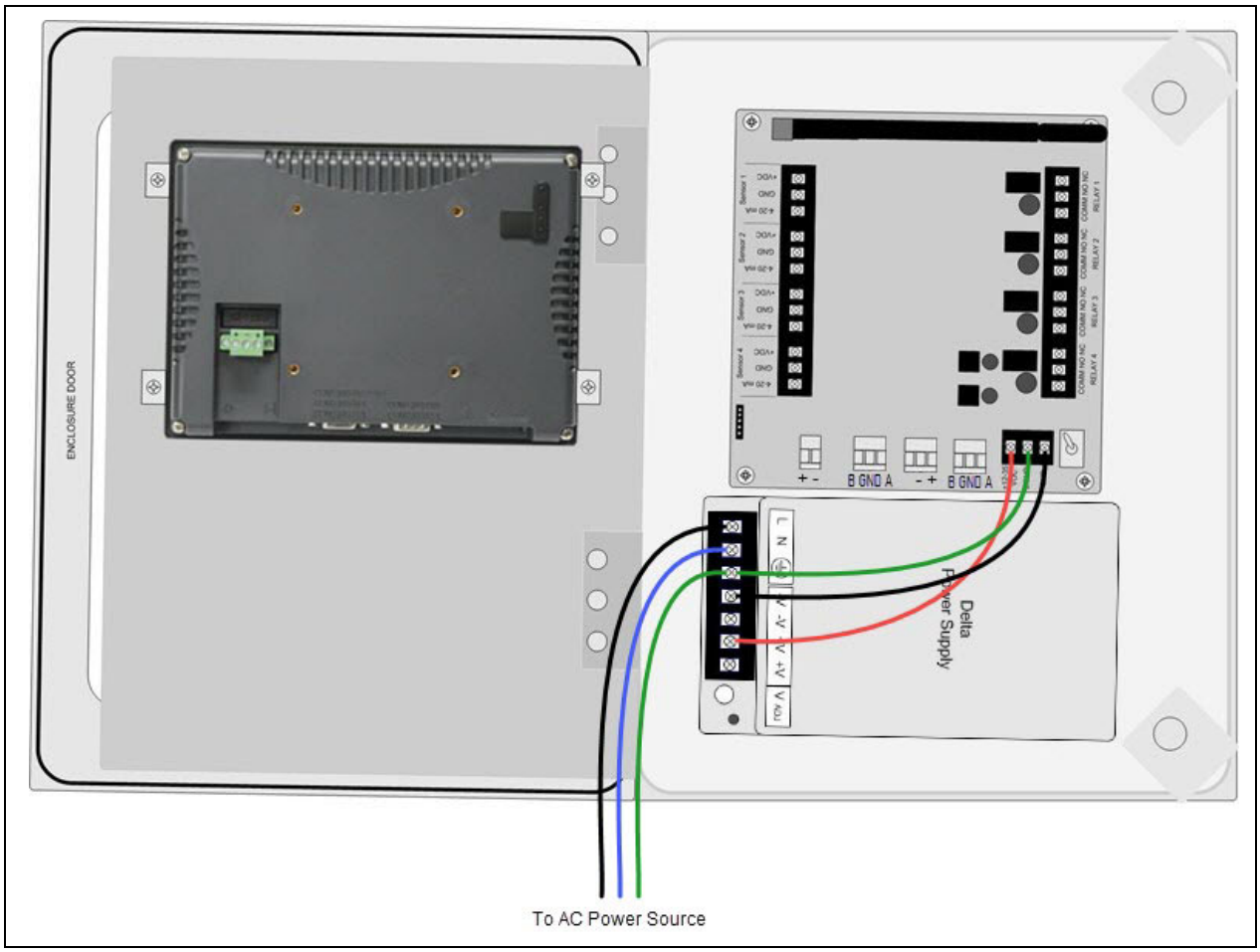



**Figure 6: AC Wiring**

7. Close the Front Panel.
8. Screw in the thumb-screws.
9. Close the enclosure box.
10. Clamp down the enclosure latches.

# RS-485 Modbus Wiring (Modbus Out)

1. Open the enclosure box to expose the Front Panel.
2. Unscrew the two thumb-screws on the Front Panel.
3. Open the Front Panel so that the Terminal Board is exposed.
4. Locate the Modbus Out Terminal Block.
5. Connect a red wire from a PLC's RS-485 A (+) terminal to the terminal labeled "A" on the Modbus Out Terminal Block.
6. Connect a green wire from a PLC's RS-485 Ground terminal to the terminal labeled "GND" on the Modbus Out Terminal Block.
7. Connect a black wire from a PLC's RS-485 B(-) terminal to the terminal labeled "B" on the Modbus Out Terminal Block.

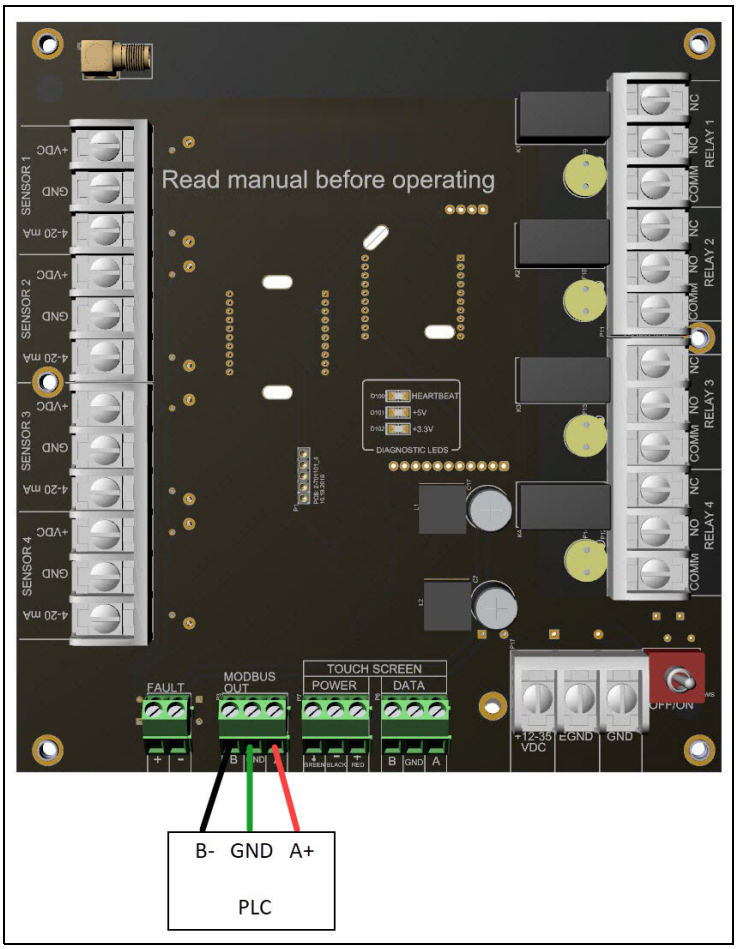



**Figure 7: Modbus Out Wiring**

8. Close the Front Panel.
9. Screw in the thumb-screws.
10. Close the enclosure box.

11. Clamp down the enclosure latches.

## *Fault Indicator Connection*

The Fault terminal provides an output to power some form of Fault indicator. The Fault terminal is wet contact, uses the same DC voltage that is powering the device, provides 500 mA maximum, and is a DC only output.

The fault terminal's failsafe operation can be configured as described on page 34.

1. Open the enclosure box to expose the Front Panel.
2. Unscrew the two thumb-screws on the Front Panel.
3. Open the Front Panel so that the Terminal Board is exposed.
4. Locate the Fault Terminal Block on the terminal board.
5. Connect a positive (red) wire to the terminal labeled "+".
6. Connect a negative (black) wire to the terminal labeled "-".

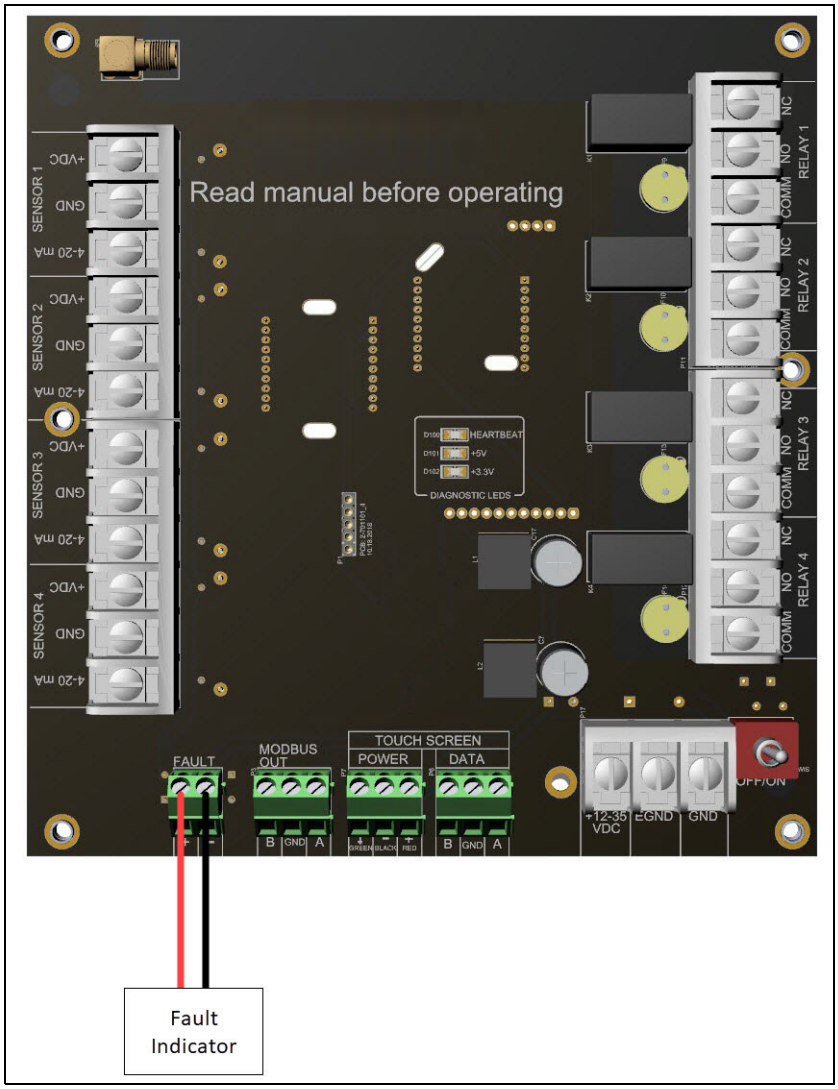



**Figure 8: Fault Indicator Wiring**

## *Connecting 4-20 mA Sensors*

The AirLink 7032 allows up to 32 AirLink sensor assemblies or up to 28 AirLink sensor assemblies and 4 wired 4-20 mA type sensor assemblies to be monitored (depending on the configuration ordered).

1. Open the enclosure box to expose the Front Panel.
2. Unscrew the two thumb-screws on the Front Panel.
3. Open the Front Panel so that the Terminal Board is exposed.
4. Locate the Sensor Terminal Blocks on the Terminal Board.
5. For each of up to 4 wired 4-20 mA type sensor assemblies:
   - Connect the sensor assembly's positive (red) wire to the terminal labeled "+VDC".
   - Connect the sensor assembly's signal (green) wire to the terminal labeled "4-20 mA".
   - Connect the sensor assembly's neutral (black) wire to the terminal labeled "GND".

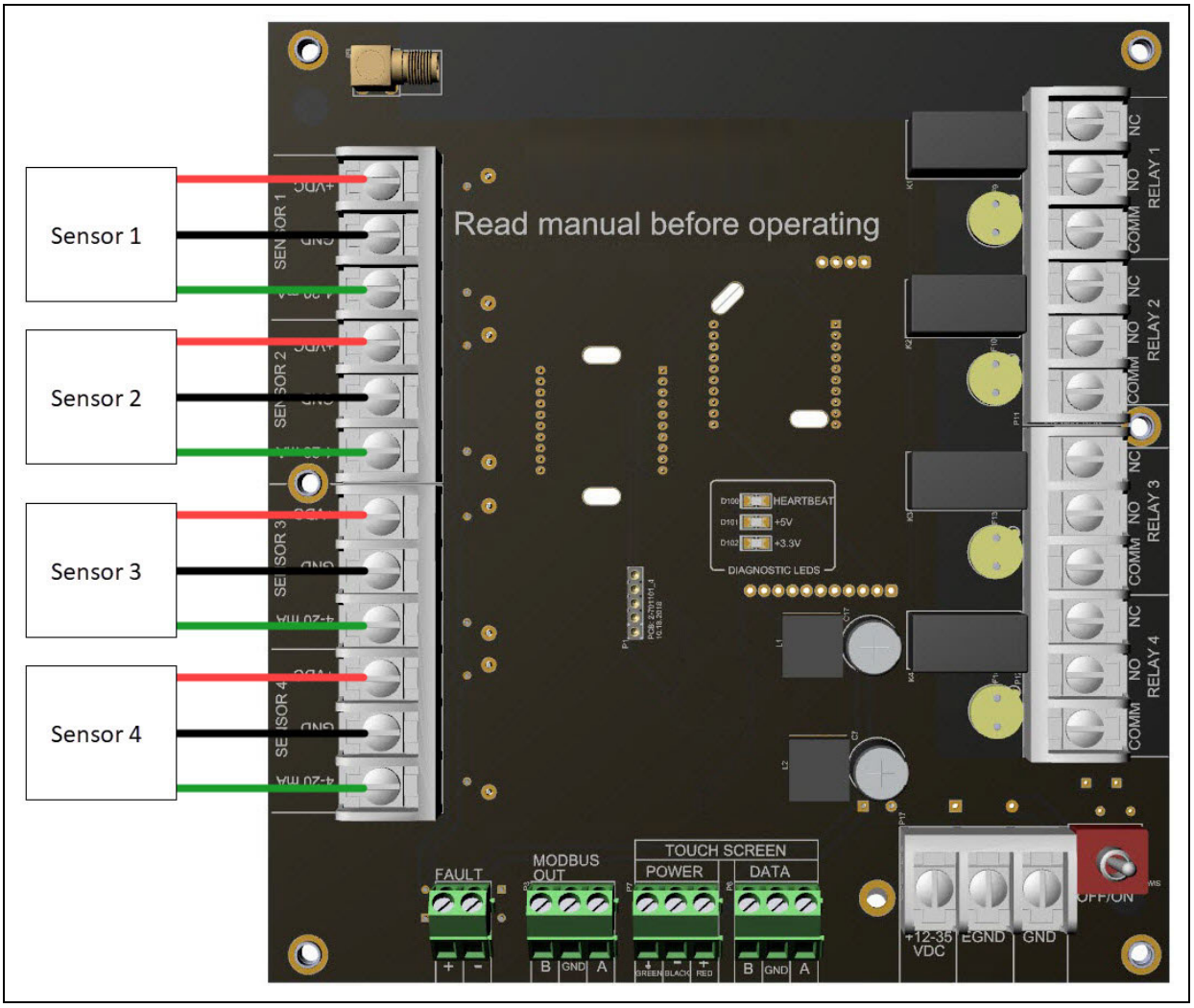



**Figure 9: Sensor Wiring**

## *Relay Wiring*

The AirLink 7032 has four relays. Each of the four relays may be setup as Normally Open (NO) or Normally Closed (NC). See page 48 for more explanation about relay actuation.

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**NOTE:** If installed, the strobe is factory wired to the Relay 1 terminals and the horn is factory wired to the Relay 2 terminals.

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1. Open the enclosure box to expose the Front Panel.
2. Unscrew the two thumb-screws on the Front Panel.
3. Open the Front Panel so that the Terminal Board is exposed.
4. Locate the Relay Terminal Blocks on the Terminal Board.
5. Connect the alarm device's "+ (H)" terminal to the **NO** or **NC** terminal on the relay terminal block.

   ---

   **NOTE:** It is recommended that the relay connections are wired as normally-open (NO). However, normally-closed (NC) wiring configurations provide an inherent fail-safe and may be preferred.

   ---

6. Connect the alarm device's "- (N)" terminal to an external power source's "- (N)" terminal.
7. Connect the external power source's "+ (H)" terminal to the COM terminal on the relay terminal block.

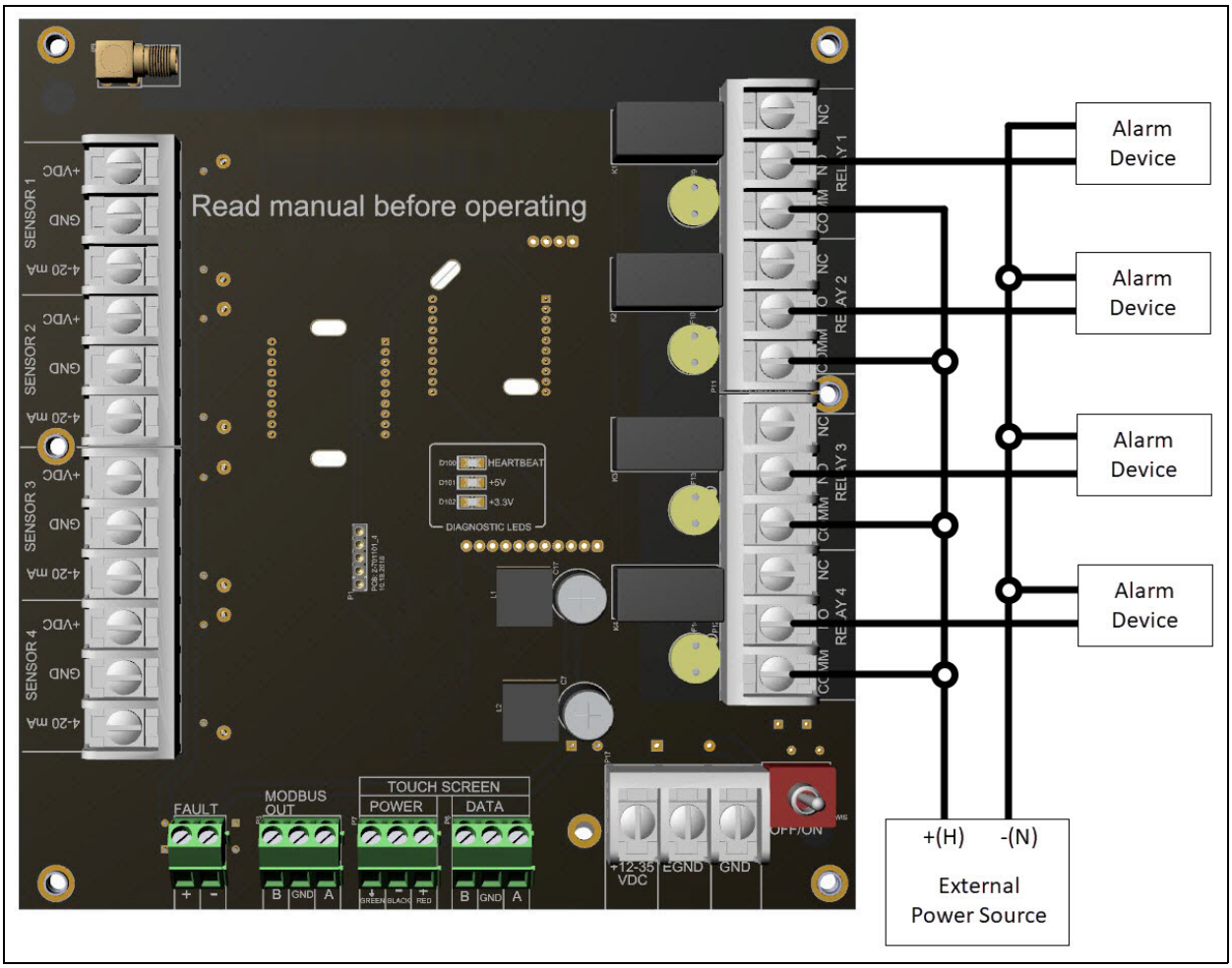



**Figure 10: Relay Wiring**

# Chapter 4: Startup and Operation

## Power On/Off

Powering on the device activates its functions. When powered on, the device is fully functional and access to system and settings menus is allowed.

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

To cycle the Terminal Board power, flip the Power Switch (located on the lower right side of the Terminal Board) to the OFF (and then ON) position.

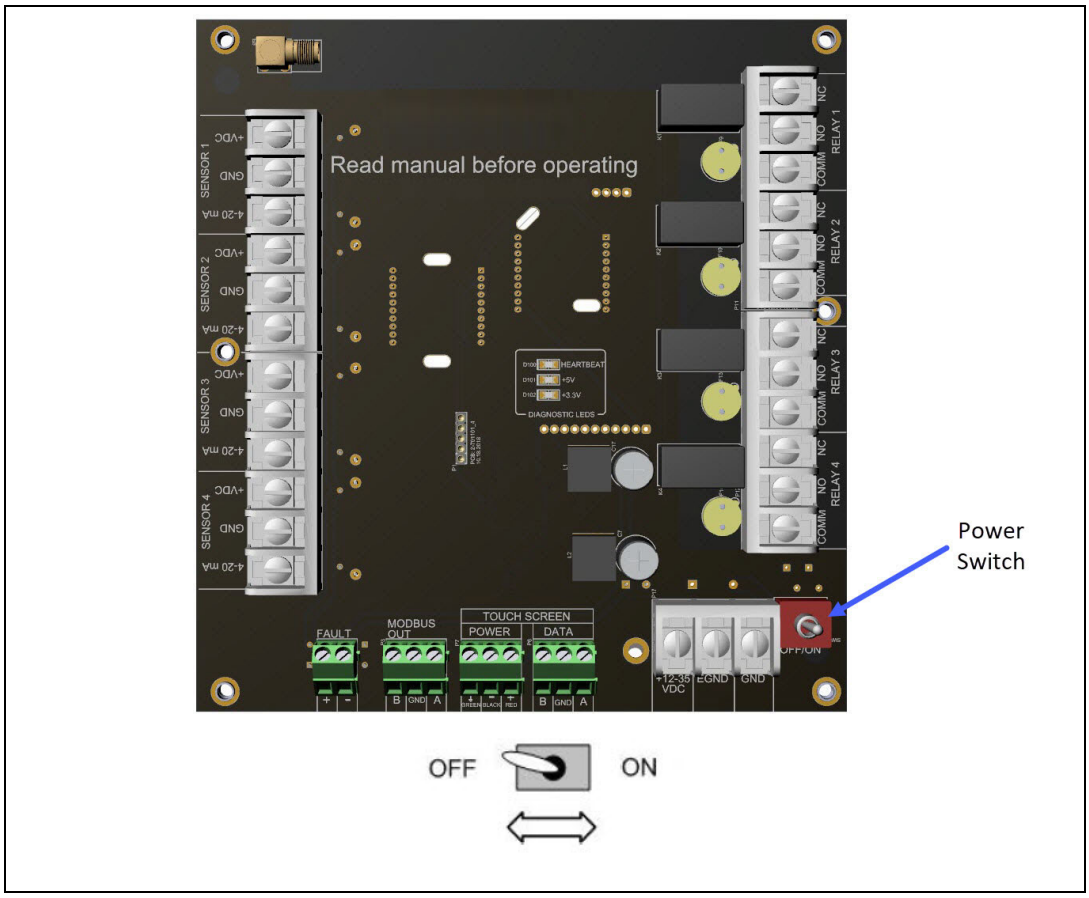



**Figure 11: Power Switch Location**

# Home Screen

The Home screen is used to access: the trend chart, real-time values, the autoscroll setting, the Channel Configuration menu, and the Advanced Configuration menu. You can return to the Home screen from any other screen by pressing the Home button.

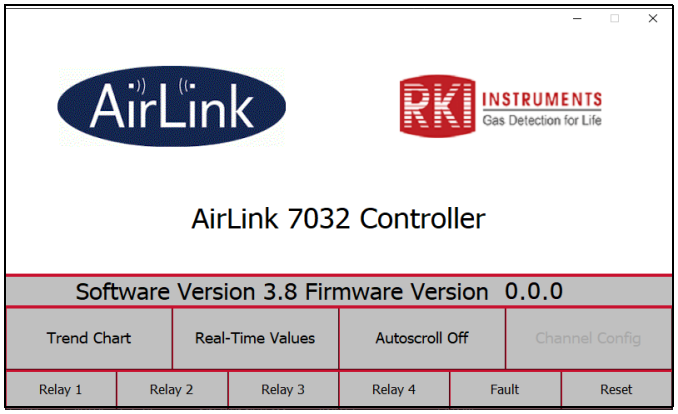
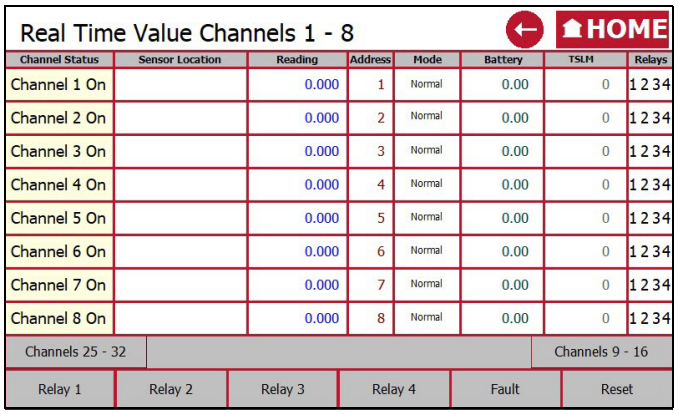



**Figure 12: Home Screen**

After 20 seconds of no button presses in the Home screen, the AirLink 7032 automatically starts scrolling through real-time values for all active channels.



# Trend Chart

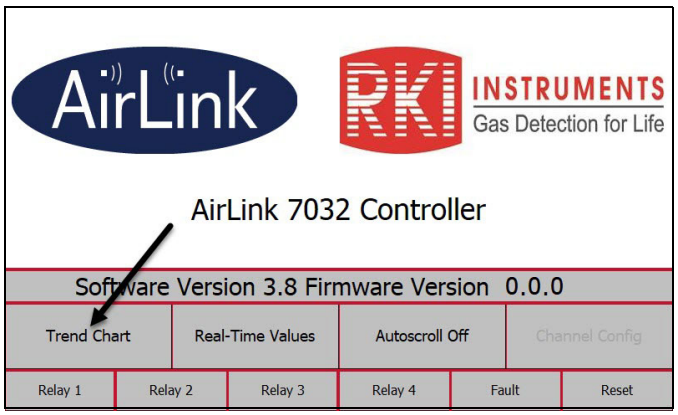
Depending on the configuration, the AirLink 7032 can either monitor up to 32 or 64 AirLink sensor assemblies. Alternatively, the AirLink 7032 can monitor 4 wired sensor assemblies with either 28 or 60 AirLink sensor assemblies (depending on the configuration ordered).

Data from up to the past 24 hours can be viewed in the Trend Chart screen. Data is always saved to the USB drive to be viewed on a computer but data available for viewing in the Trend Chart screen gets cleared every night at midnight.

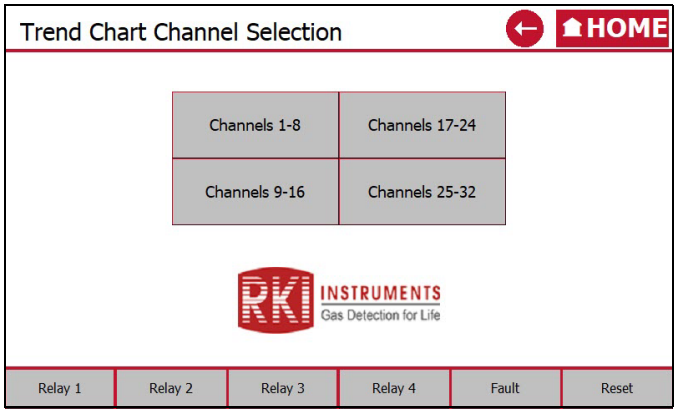
Readings for the trend chart are updated every 5 seconds.

The trend chart does not autoscroll, regardless of the Autoscroll setting on the Home screen.

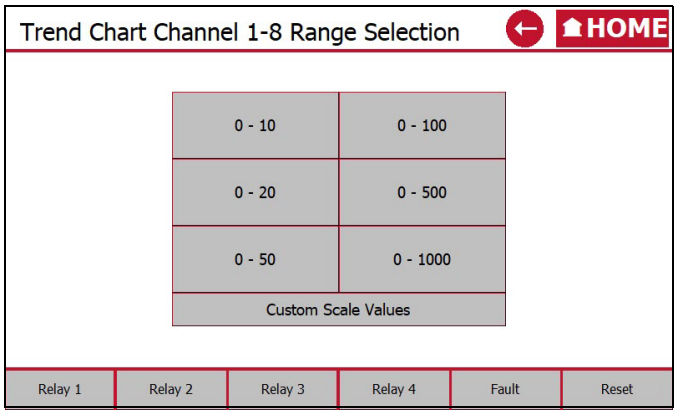
1. If necessary, press the **Home** button to return to the Home screen.
2. From the Home screen, press and release the **Trend Chart** button.



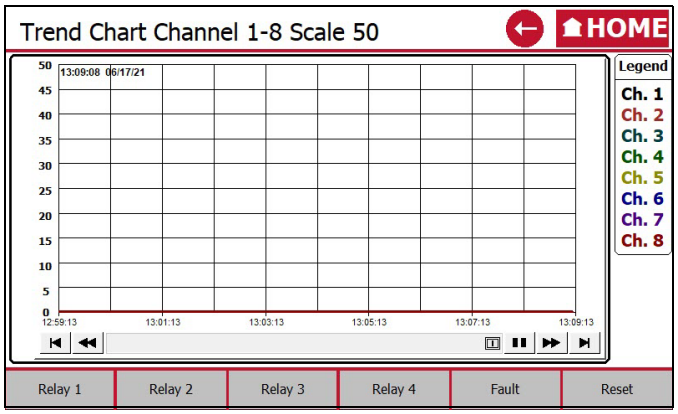

3. Select the bank of channels you want to view.



4. Select the full scale range for the chart.




5. The trend chart displays.




6. Use the buttons at the bottom of the chart to view available data.

# Real-Time Values

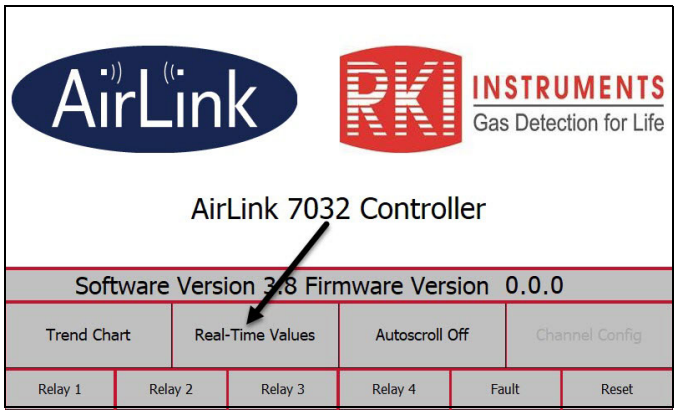
Depending on the configuration, the AirLink 7032 can either monitor up to 32 or 64 AirLink sensor assemblies. Alternatively, the AirLink 7032 can monitor 4 wired sensor assemblies with either 28 or 60 AirLink sensor assemblies (depending on the configuration ordered).

If the instrument is in the Home screen for more than 20 seconds, it starts autoscrolling through real-time value pages, 20 seconds at a time, regardless of the Autoscroll setting.

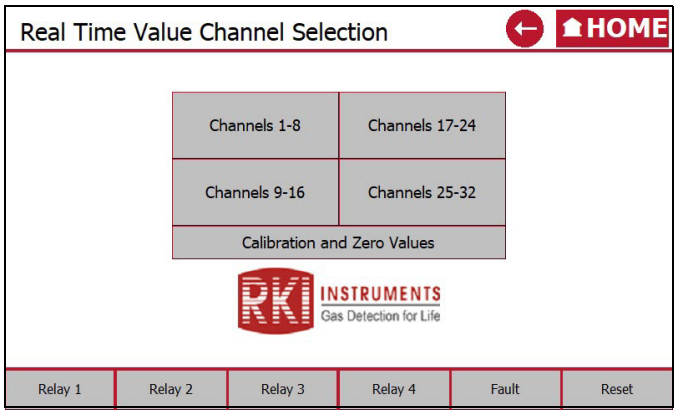
To view real-time value pages without the pages autoscrolling, return to the Home screen, make sure Autoscroll is set to off, and manually enter the Real-Time Values screen.

1. If necessary, press the **Home** button to return to the Home screen.
2. Confirm that the **Autoscroll** setting on the Home screen is set appropriately.

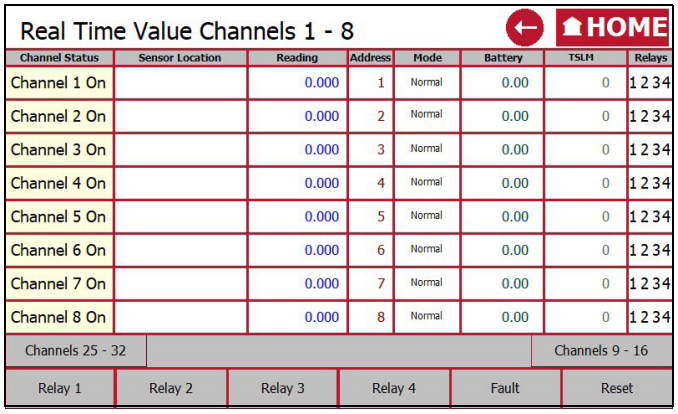
3. From the Home screen, press and release the **Real-Time Values** button.




4. Select the bank of channels you want to view.

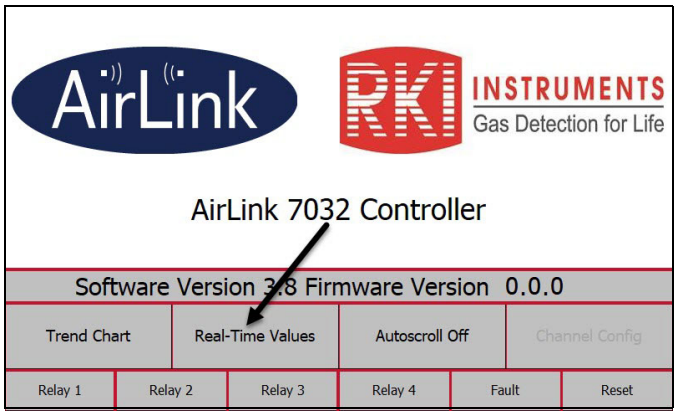



5. The channel status, sensor location, real-time value, radio address (AirLink detector only), mode, battery level (AirLink detector only), time since last message (AirLink detector only), and relay status display.

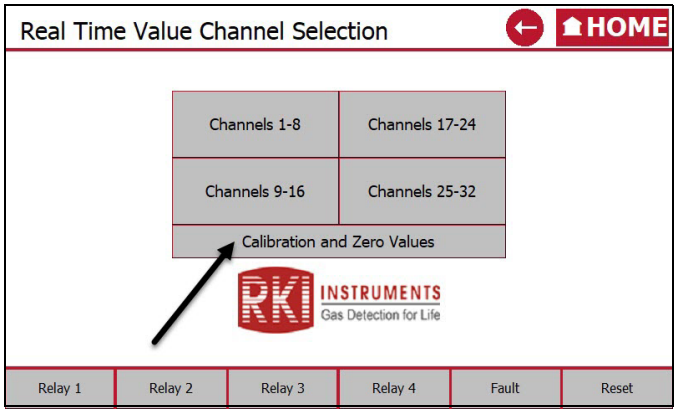


# View Days Since Last Zero and Cal

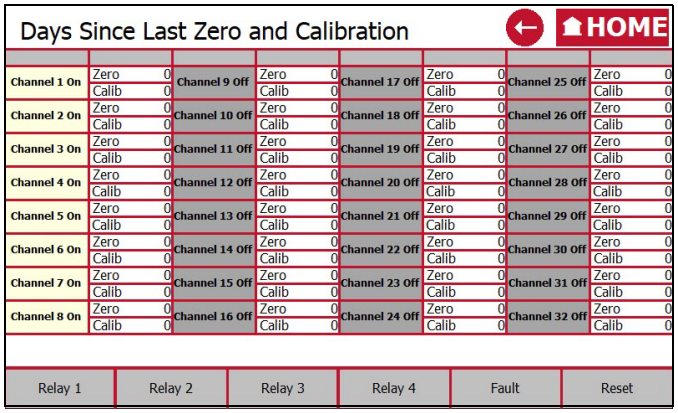
1. If necessary, press the **Home** button to return to the Home screen.
2. From the Home screen, press and release the **Real-Time Values** button.




3. Press and release the **Calibration and Zero Values** button.




4. The number of days since the last zero and calibration display for each channel.



# Alarms

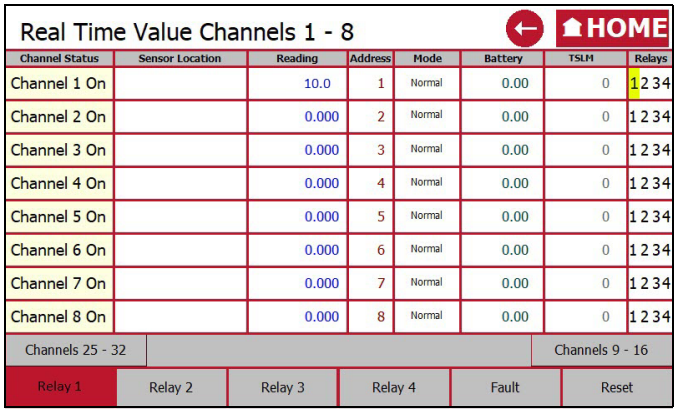
Relay indicators appear at the bottom of every screen in the AirLink 7032. The indicators turn either solid red or flash, as described below, to indicate an alarm condition.

| Indicator | Color | Description |
|---|---|---|
| Relay 1 | off | No alarm condition has occurred on relay 1 since the last reset or power up |
| | solid red | An alarm condition is currently happening on relay 1 |
| | blinking red | An alarm condition has occurred on relay 1, but condition has now gone |
| Relay 2 | off | No alarm condition has occurred on relay 2 since the last reset or power up |
| | solid red | An alarm condition is currently happening on relay 2 |
| | blinking red | An alarm condition has occurred on relay 2, but condition has now gone |
| Relay 3 | off | No alarm condition has occurred on relay 3 since the last reset or power up |
| | solid red | An alarm condition is currently happening on relay 3 |
| | blinking red | An alarm condition has occurred on relay 3, but condition has now gone |
| Relay 4 | off | No alarm condition has occurred on relay 4 since the last reset or power up |
| | solid red | An alarm condition is currently happening on relay 4 |
| | blinking red | An alarm condition has occurred on relay 4, but condition has now gone |
| Fault | off | No Fault condition has occurred on any sensor unit since the last reset or power up |
| | solid blue | A Warning condition is currently happening on at least one sensor unit |
| | solid orange | A Fault condition is currently happening on at least one sensor unit |

## *Gas Alarm*

The Real-Time Values screen has a column for relay status. If the reading on a particular channel has activated one of the AirLink 7032's relays, the relay number on that channel's Real-Time Values screen gets a yellow background.

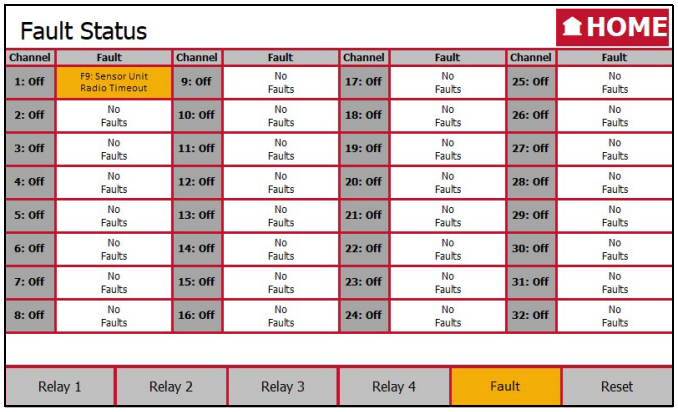
For example, if Channel 1's reading activates Relay 1, the Relay 1 indicator at the bottom of the screen turns red and the "1" in Channel 1's Relays column gets a yellow background.




1. Press **Reset** to clear an alarm indication once the alarm condition has cleared.

# *Fault or Warning Alarm*

Press the Fault indicator from any screen to see the fault screen. Fault and warning codes are described on page 40.




1. Press **Reset** to clear an alarm indication once the alarm condition has cleared.

# Chapter 5: Channel Configuration Menu

## Overview

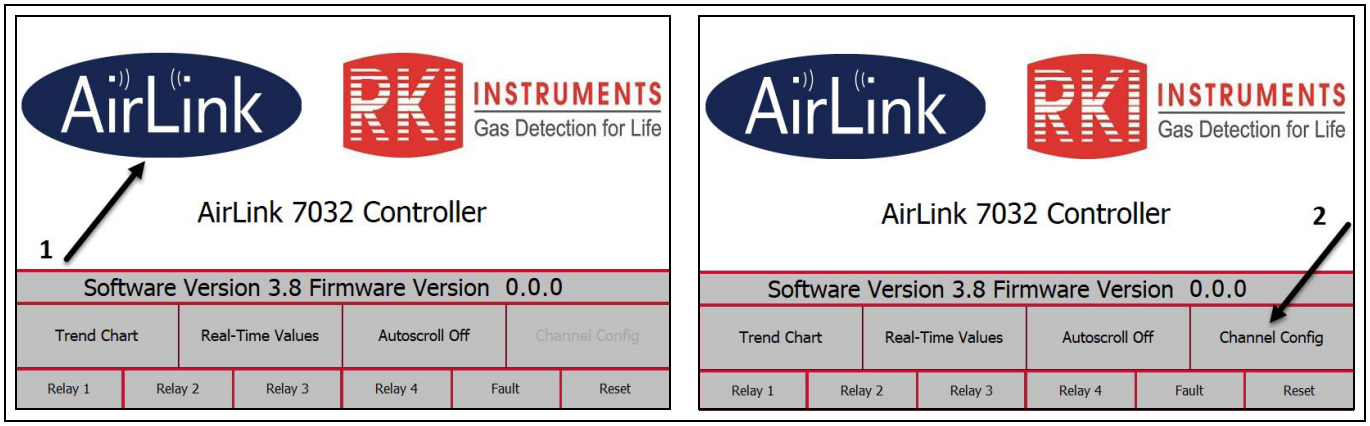
This mode is used for: Channel Settings (On/Off, Wired/AirLink, gas, range, radio address, location), Relay Settings (On/Off, Low/High, Value, Latching/Auto Resetting), and setting the date, time, and location for the AirLink 7032.

**NOTE:** Each channel must be set up individually but a **Duplicate Channels** button makes it easier to set up channels that have the same settings.

**NOTE:** To save any changes and return to the Home screen at any time, press the **Home** button. The AirLink 7032 automatically saves any changes and returns to the Home screen 15 minutes after the last button press.

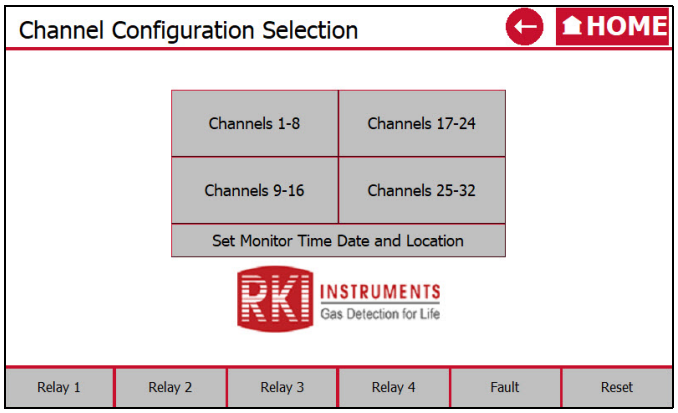
## Entering the Channel Configuration Menu

1. Open the enclosure box.
2. If necessary, press the **Home** button to return to the Home screen.
3. From the Home screen, press and release the **AirLink** logo and then press and release the **Channel Config** button.

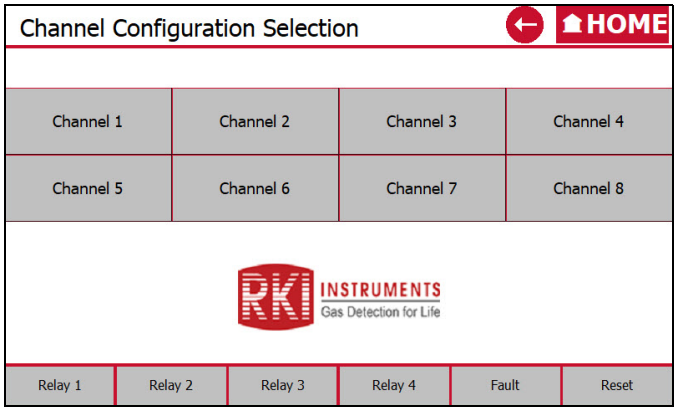


# Editing Channel Settings

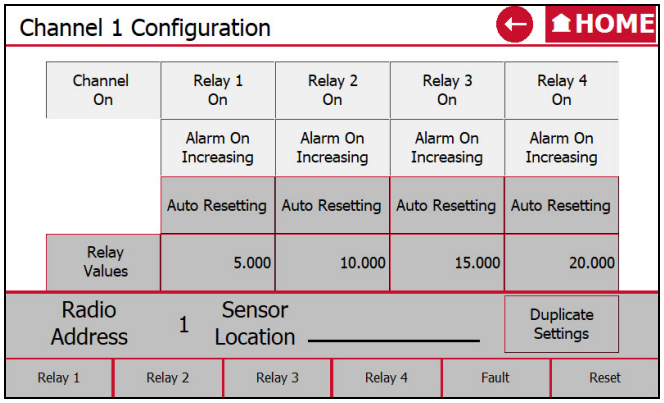
1. Enter the Channel Configuration Menu as described above.
2. Select the channel bank for the channel you want to set up.



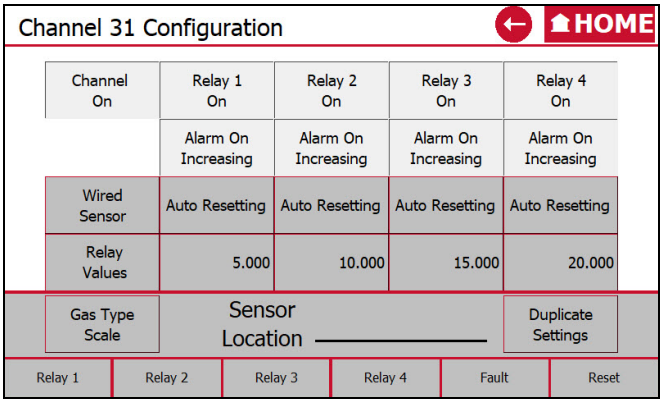

3. Select the channel you want to set up.




4. The channel settings screen appears.




AirLink channel




Wired channel

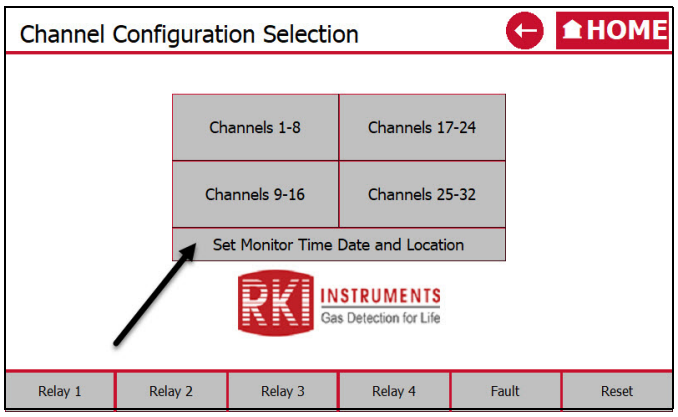
5. Set up the channel. The parameters are described below.

| Parameter | Description |
|---|---|
| Channel On/Off | On: Channel is active and attempting to connect to a detector.<br>Off: Channel is inactive and not attempting to connect to a detector. |
| Wired/AirLink Sensor (only for channels 29-32 or 61-64, depending on the configuration ordered) | Wired: 4-20 mA type detector is wired into the Sensor Terminal Blocks on the Terminal Board.<br>AirLink: Detector is communicating with the AirLink 7032 wirelessly.<br>Any 4-20 mA type detectors wired directly to the AirLink 7032 must be set up on the following channels:<br>• For 32-channel versions: Channels 29-32<br>• For 64-channel versions: Channels 61-64<br>***NOTE:*** *If a repeater is used to connect any AirLink sensors to the monitor, then all AirLink sensor connections must be routed through the repeater; there cannot be a combination of AirLink sensors making direct radio connection to a monitor while other AirLink sensors make radio connection to the monitor through a repeater.* |
| Relay On/Off | On: Relay will activate when the selected channels' reading reaches the value shown in Relay Value.<br>Off: Relay will not activate for the selected channel. |
| Alarm On Increasing/Decreasing | Increasing: Relay will activate if the selected channel's reading rises above the value shown in Relay Value.<br>Decreasing: Relay will activate if the selected channel's reading falls below the value shown in Relay Value. |
| Auto Resetting/Latching | Auto Resetting: Once the alarm condition clears, the AirLink 7032 automatically resets the alarm indications.<br>Latching: Once the alarm condition clears, you must press the Reset button to reset the alarm indications. |
| Relay Values | Gas reading at which the relay will activate.<br>*For wired detectors, the full scale value must be set before you can define relay values.* |
| Gas Type Scale (for wired detectors only) | Define the target gas and full scale value for the selected channel. Available target gases are: H2S, SO2, O2, CO, Cl2, CO2, LEL,VOC, FEET, HCl, NH3, H2, CLO2, HCN, F2, HF, CH2O, NO2, O3, INCHES, Gas 4-20, None, Celcius, Fahrenheit, CH4, NO, PH3, HBr, EtO, CH3SH, AsH3, R410A, R1234YF, R32 |
| Radio Address (for AirLink channel only) | Enter the radio address of the detector assigned to this channel. |

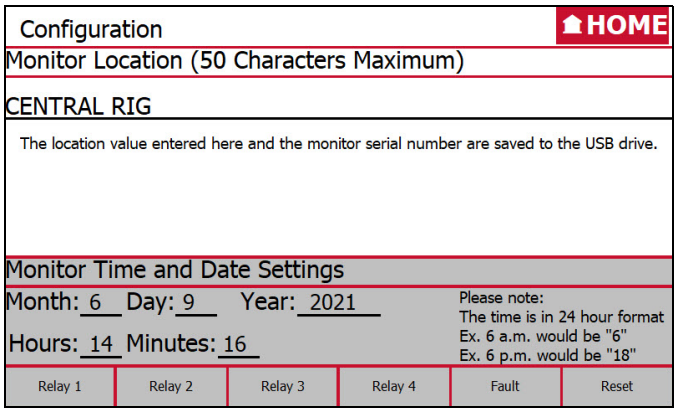
| Parameter | Description |
|---|---|
| Sensor Location | Enter a 10-character name that defines where the detector is installed. |
| Duplicate Settings | Duplicates settings on all subsequent channels with the exception of the radio address (increments by 1) and the location. |
| ***NOTE:*** *If the 4th relay is set as a fault relay in the Advanced Configuration Menu, it will not appear in this screen.* | |

# Changing the Date, Time, and Location

1. Enter the Channel Configuration Menu as described on page 29.
2. Press and release **Set Monitor Time Date and Location**.




3. Type in the AirLink 7032's location and the current date and time.




4. Press the **Home** button to save the settings and return to the Home screen.

# Exiting the Channel Configuration Menu

Complete the following steps to exit the Channel Configuration Menu at any time.

1. Press the **Home** button.
2. Close the enclosure box.
3. Clamp down the enclosure latches.

**NOTE:** The AirLink 7032 automatically saves any changes and returns to the Home screen 15 minutes after the last button press.

# Chapter 6: Advanced Configuration Menu

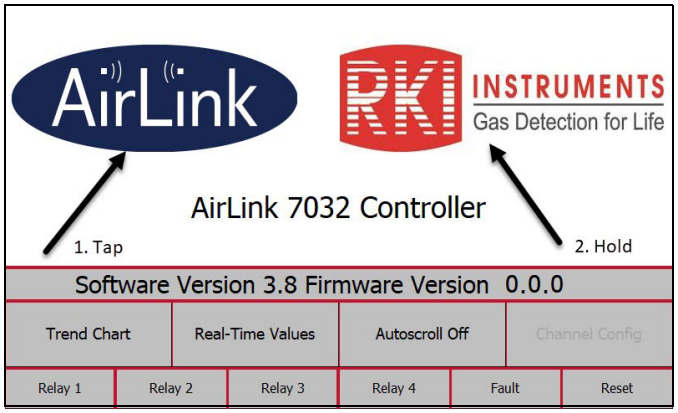
## Overview

This mode is used to: restore factory default settings, set up global Modbus parameters, set up AirLink parameters, adjust the failsafe setting for the relays, and assign Relay 4 to be a fault relay. This mode is also used to perform a calibration. See page 37 for calibration instructions.

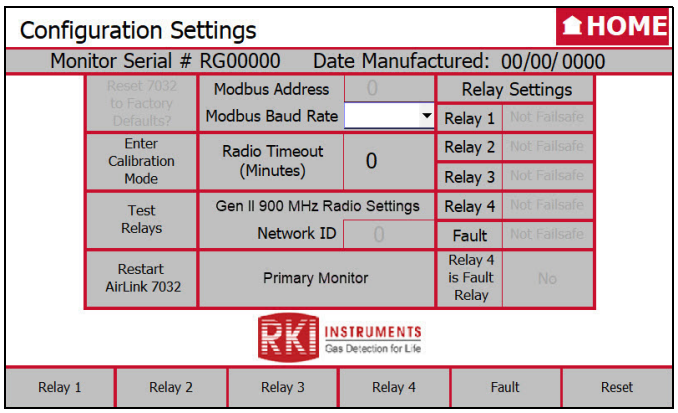
## Editing Advanced Configuration Parameters

You only have 30 seconds at a time to edit the parameters in the Advanced Configuration menu. It is recommended that you review each setting beforehand and decide what changes you want to make before starting to edit the parameters.

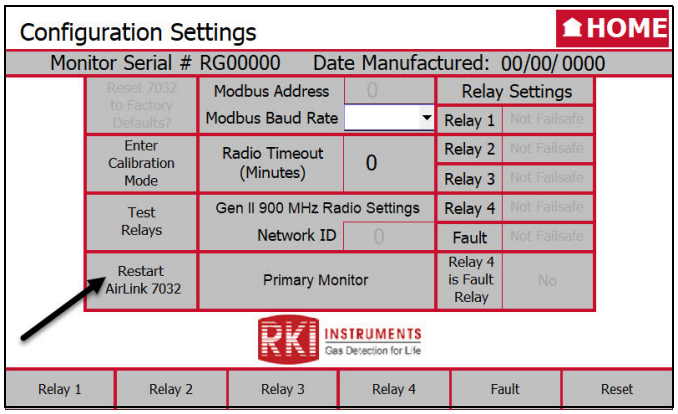
1. Open the enclosure box to expose the Front Panel.
2. Tap the **AirLink** logo then press and hold the **RKI** logo for 5 seconds.




3. The base layer of the Advanced Configuration Menu appears.



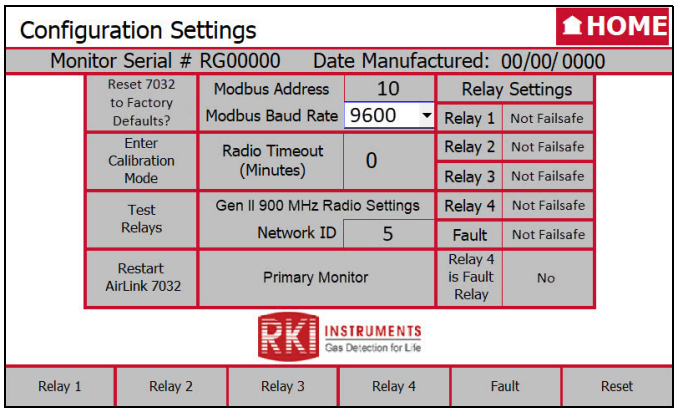
4. Press **Restart AirLink 7032**.




5. Press **OK** in the window that pops up.

6. A message appears that says **Control Board: No Response**. Press **Close** or ignore the message.

7. All parameters become available for editing for <u>30 seconds only</u>. After 30 seconds, the AirLink 7032 returns to the Home screen.




8. Edit the desired parameters. They are described below.

| Parameter | Description |
|---|---|
| Reset AirLink 7032 to Factory Defaults? | Sets the AirLink 7032 back to factory defaults, listed below.<br>• Channels 1-28 or 1-60 set to AirLink (depending on the configuration ordered)<br>• Channels 29-32 or 61-64 set to Wired (depending on the configuration ordered)<br>• Relays set at “10, 15, 20 and 25”<br>• All relays set to “Auto Resetting” / “Increasing”<br>• Modbus Output Baud set at 9600<br>• Radio Timeout set to 10 minutes<br>• Network ID set to 5<br>• Primary Monitor<br>Press OK to confirm the reset. |

| Parameter | Description |
|---|---|
| Modbus Address | Type in a Modbus address (1-247) for the AirLink 7032's Modbus output. |
| Modbus Baud Rate | Select a baud rate for the AirLink 7032's Modbus output. Available choices are: 1200, 2400, 4800, 9600 (factory setting), and 19200. |
| Radio Timeout | The Radio Timeout is the amount of time (between 6 and 255 minutes) that must pass after a AirLink detector loses connection with the AirLink 7032 before the AirLink 7032 shows an F9 fault code for that channel. |
| Network ID | Type in the system's network ID (between 1 and 52 for 900 MHz systems or between 1 and 78 for 2.4 GHz systems).<br>All monitors and sensor assemblies must have the same Network Channel in order to communicate. |
| Primary/Secondary | Select the Primary/Secondary status for the AirLink 7032 (factory setting is Primary).<br><br>There can only be one Primary monitor on a network. All other monitors must be set up as Secondary monitors.<br><br>If an AirLink 7032 is set as a Secondary monitor when there is no Primary monitor, the AirLink 7032 will go into an F15 fault. |
| Relay 1, 2, 3, and 4 Failsafe Settings | Independently set the 4 relays to Failsafe or Not Failsafe. See page 48 for more description about relay operation. |
| Relay 4 Fault Relay | Yes: Relay 4 acts as a fault relay and cannot be assigned to a gas alarm.<br>No: Relay 4 does not act as a fault relay and can be assigned to a gas alarm. |

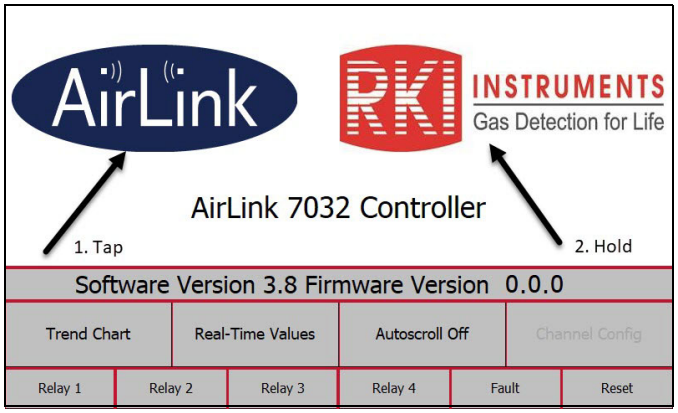
9. After 30 seconds, the AirLink 7032 automatically saves any changes and returns to the Home screen. If you need to change additional settings, repeat Step 2 - Step 8.

# Chapter 7: Maintenance

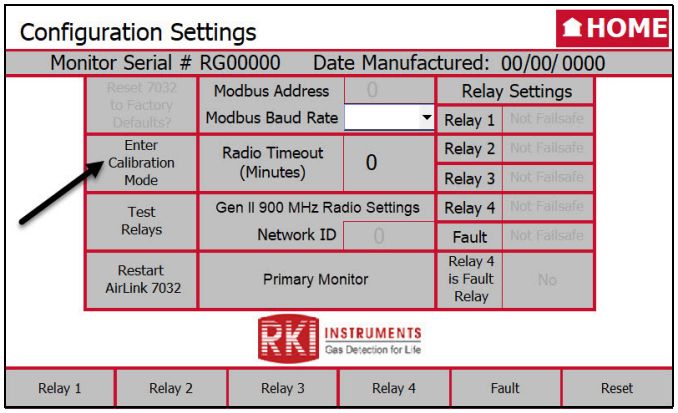
## Calibration Mode

Entering Calibration Mode disables the relays and allows the sensors to be calibrated without triggering alarms. Once in Calibration Mode, the unit will remain there for two hours—unless you press the Calibration Mode Active or Home button.

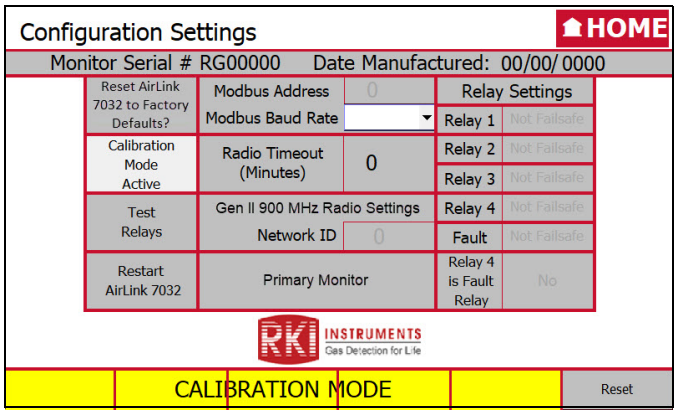
1. Open the enclosure box to expose the Front Panel.
2. Tap the **AirLink** logo then press and hold the **RKI** logo for 5 seconds to enter the Advanced Configuration Menu.




3. Press **Enter Calibration Mode**.



4. Once in Calibration Mode, the screen appears as shown below.




5. Press **Calibration Mode Active** to return to the Advanced Configuration screen.

**NOTE:** If **Calibration Mode Active** is not pressed, the unit will remain in Calibration Mode for two hours and then it will start autoscrolling through the Real-Time Values for active channels.

6. Press the **Home** button to return to the Home screen.

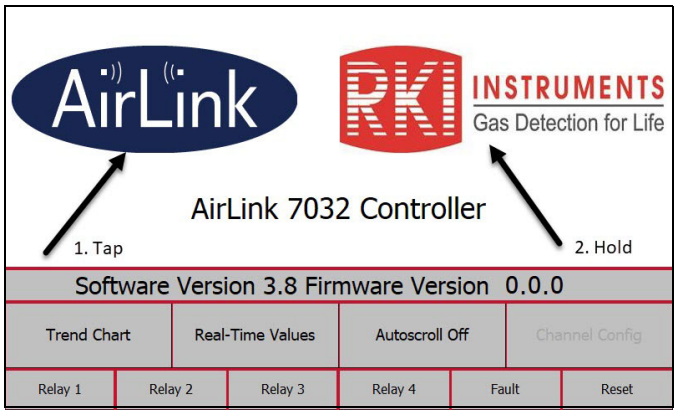
**NOTE:** The AirLink 7032 automatically returns to the Home screen 15 minutes after the last button press.

7. Close the enclosure box.
8. Clamp down the enclosure latches.

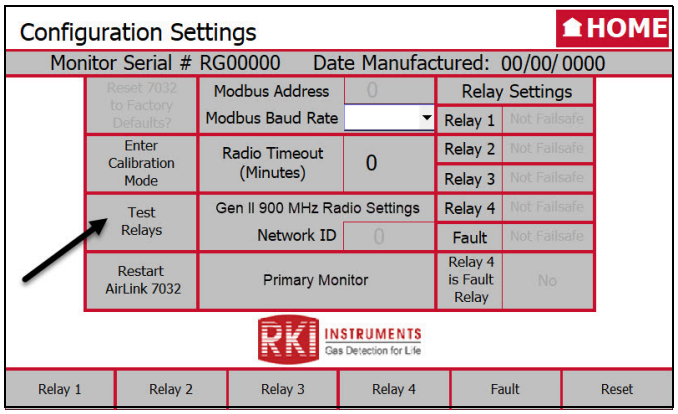
# Relay Test Mode

Relay Test Mode activates each relay and can be used to determine whether or not the relays and attached alarms are functioning properly.

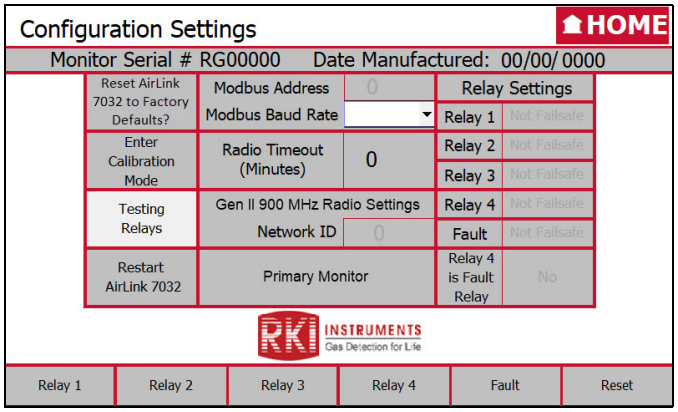
1. Open the enclosure box to expose the Front Panel.
2. Tap the **AirLink** logo then press and hold the **RKI** logo for 5 seconds.



3. Press **Test Relays**.




4. Starting with Relay 1, the relays will activate in 5-second intervals. The corresponding relay indicator along the bottom of the screen will turn red when the relay activates.




5. 5 seconds after the 4th relay is activated, all relays return to their normal state and **Test Relays** is no longer selected.

6. Press the **Home** button to return to the Home screen.

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**NOTE:** The AirLink 7032 automatically returns to the Home screen 15 minutes after the last button press.

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7. Close the enclosure box.

8. Clamp down the enclosure latches.

# Troubleshooting

Table 2 describes symptoms, probable causes, and recommended actions for the most common problems you may encounter with the AirLink 7032.

**NOTE:** This troubleshooting guide describes AirLink 7032 problems only. See the detector head operator's manuals for preventive maintenance procedures that apply to the detector heads installed on your AirLink 7032.

**Table 2: Troubleshooting the AirLink 7032**

| Condition | Probable Causes | Recommended Action |
|---|---|---|
| Two Primary Monitors | • The AirLink 7032 was setup to be a primary monitor but was turned off or reset so the secondary monitor became the primary monitor.<br>• A primary monitor already exists on the network and is conflicting with the AirLink 7032's default as primary monitor. | 1. Turn off the other monitor on the network or make sure that only one of the monitors is set up to be the primary monitor. |
| All Channels Turned Off | Autoscroll is turned on but all channels are turned off. | 1. Turn on and set up all necessary channels as described on page 29. |
| **Temperature Warning** (for IR detector heads only) | The sensor is undergoing a rapid temperature change, resulting in the potential loss of accuracy. | 1. Once the sensor element temperature has stabilized, the warning will clear. |
| **F1** (Only for AirLink T3A/ AirLink VOC Pro) | The top card has lost communication with the digital sensor board (the board potted into the sensor housing). | 1. Check the connections and/or try new digital sensor board. |
| **F3** (battery powered detector only) | The Low Power IR sensor is beyond repair. | 1. Replace the IR sensor. |

**Table 2: Troubleshooting the AirLink 7032 (Continued)**

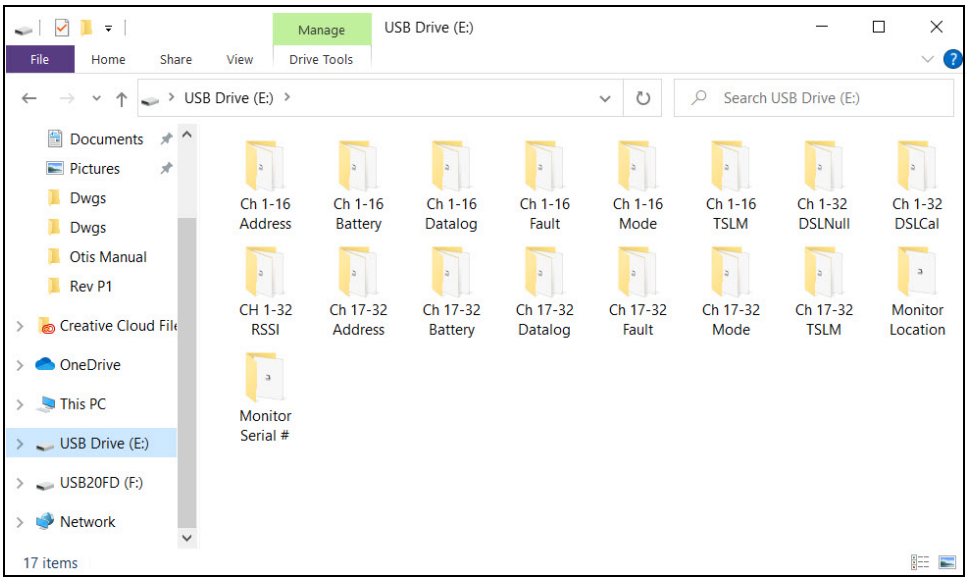
| Condition | Probable Causes | Recommended Action |
|---|---|---|
| **F4** | • The top card is losing communication to the analog sensor board<br>• On AirLink T3A/AirLink VOC Pro units, F4 means that the Analog to Digital Conversion (ADC) on the analog sensor board is not communicating to the digital sensor board.<br>• On the AirLink 6900, F4 means the top card is not communicating with the analog sensor board.<br>• For IR sensors, the sensor element itself could be the issue. Also, there might not be an issue because sometimes sensor assemblies will show F4 for a few seconds after boot up. This is normal and is due to the boot up of the sensor element itself. | 1. Check the orientation of the analog sensor board and/or try a new analog sensor board.<br>2. Check the connections from the top card all the way to the analog sensor board. If that does not fix the fault, try replacing the analog sensor board and/or the sensor housing. |
| **F5** | The sensor assembly did not zero correctly. | 1. Confirm that no gas is present.<br>2. Replace the sensor. |
| **F6** | The sensor assembly did not auto cal correctly. | 1. Confirm the gas concentration is correct and that it is flowing to the sensor.<br>2. Replace the sensor. |
| **F8** | • There are 2 sensor assemblies with the same address trying to communicate with the monitor.<br>• There is a combination of AirLink sensors making direct radio connection to the monitor and AirLink sensors with radio connection routed through a repeater. | 1. Make sure all sensor assemblies have unique addresses.<br>2. If a repeater is part of the AirLink system, all AirLink sensor radio connections to the monitor must be routed through the repeater. |
| **F9** | The monitor has not received a communication from the faulting sensor assembly address for the timeout period set on page 34. | 1. Check the sensor assembly for a dead battery, broken antenna, bad antenna cable, missing antenna, obstacle, weather, etc. |
| **F10**<br>(4-20 mA wired detector only) | When using a monitor with wired sensor assemblies attached, the sensor is not communicating with the monitor. The problem could be that the sensor assembly is not connected properly, or there may be board issues with the sensor or monitor. | 1. Check all connections. Use a current meter inline to see if the current is correct. |

**Table 2: Troubleshooting the AirLink 7032 (Continued)**

| Condition | Probable Causes | Recommended Action |
|---|---|---|
| **F11** (battery powered detector only) | The IR sensor is changing temperature too quickly. | 1. The sensor will clear once the temperature stops changing too quickly. |
| **F13** (4-20 mA wired detector only) | When using a monitor with a 4-20mA wired connection, F13 may appear when the sensor assembly is in a fault condition. | 1. Since it is 4-20mA, the monitor does not know the exact fault condition. Therefore, check the sensor assembly to see what the fault is and then consult other items in this chart for a solution. |

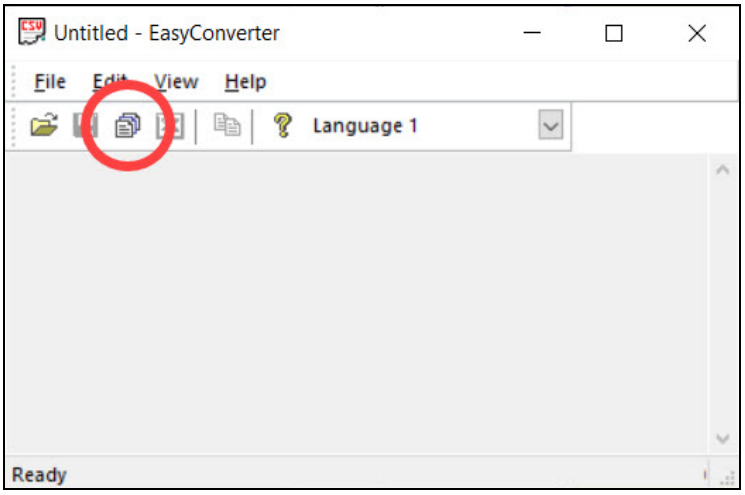
# Chapter 8: Viewing Log Files

1. Download and install the EZWare-5000 converter software, found here:
   https://www.maplesystems.com/General/DownloadFile?s=sw&n=EZware-5000%20v4.65.16&f=ez5000setup.zip
2. Remove the SD card with USB adapter from the AirLink 7032.
3. Plug the SD card with USB adapter into an available port.
4. Use Windows Explorer to view the contents of the SD card.

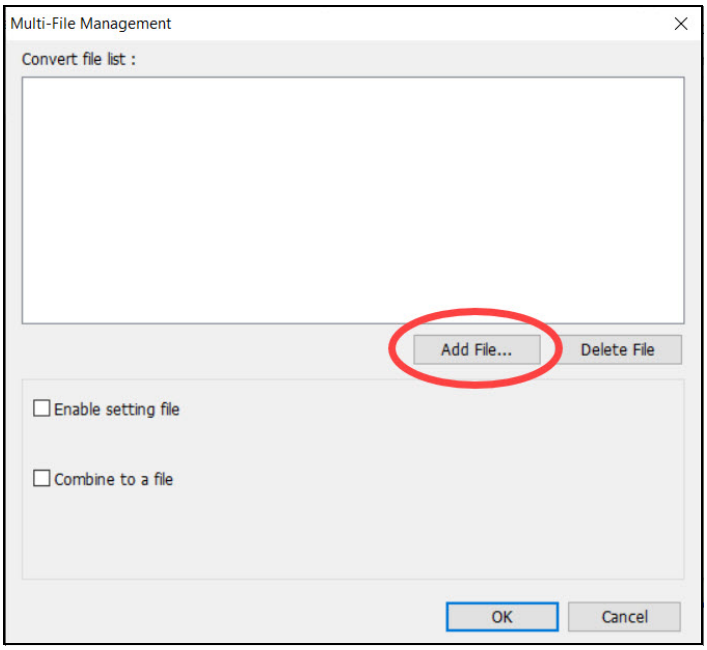



5. There are folders for each channel's: address, battery voltage, interval data (logged every 5 seconds), fault code(s), time since last message, days since last null, days since last cal, and received signal strength indicator. There are also folders for the monitor location and the monitor serial number. Each folder contains .dtl files of data. The .dtl files must be converted to Excel files using Easy Converter before the data can be viewed.
6. In some cases, double clicking a .dtl file will open Easy Converter and convert the file to a .xls file.

7. If double-clicking the .dtl file does not automatically convert it to a .xls file:
   a. Open Maple Systems\Easy Converter from the Start menu.
   b. Click the **Open** button.

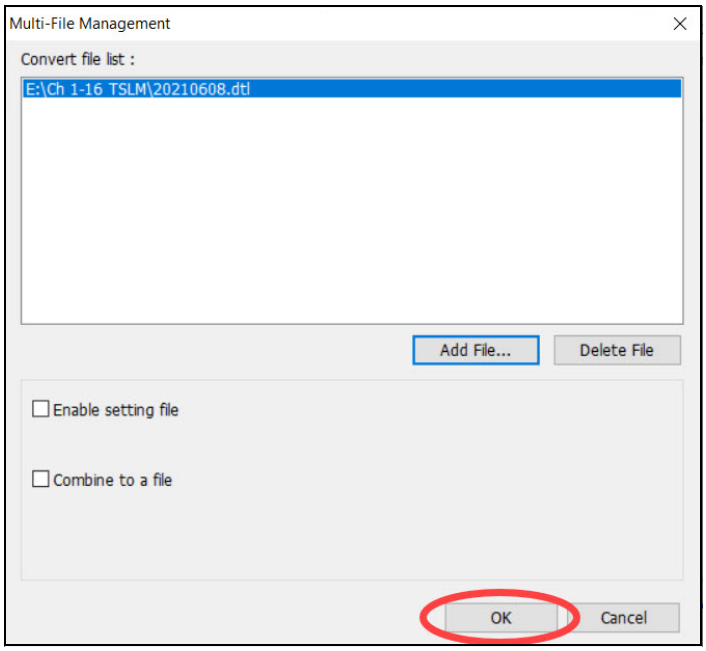



   c. Click **Add File**.

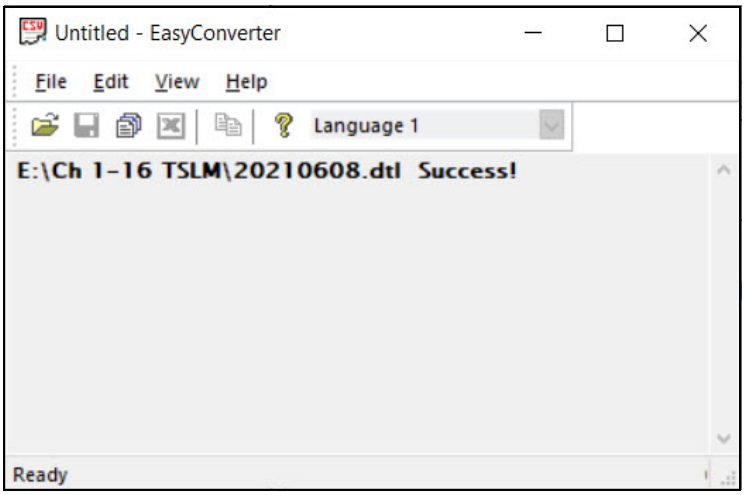



   d. Navigate to the .dtl file you want to convert.

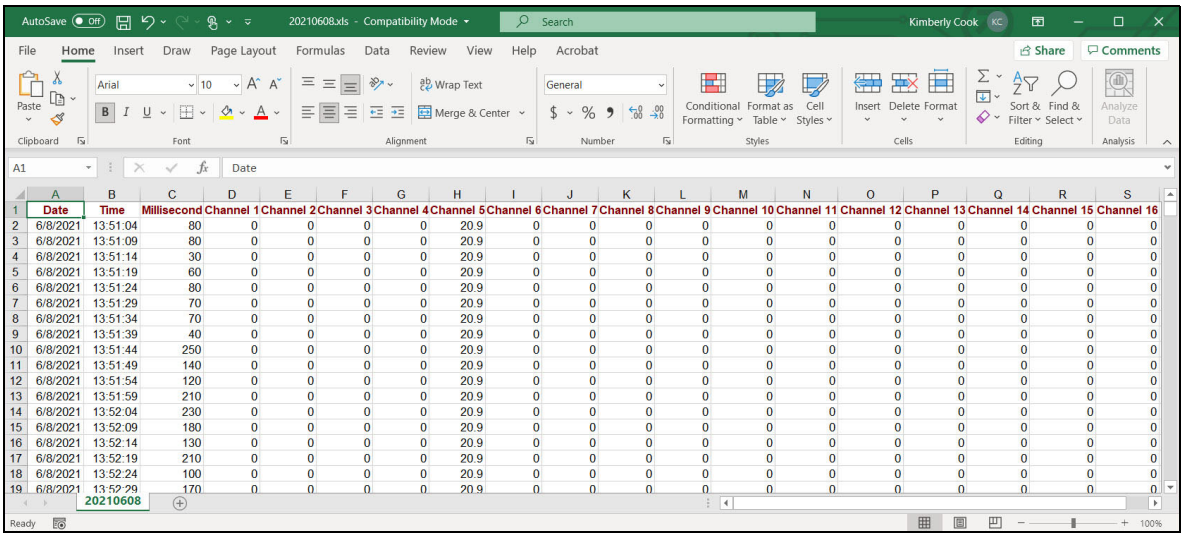
e. Click **OK**.




f. The program indicates that the conversion was successful.



8. Open converted .xls files in Excel or another spreadsheet software to view the data.



| Date | Time | Millisecond | Channel 1 | Channel 2 | Channel 3 | Channel 4 | Channel 5 | Channel 6 | Channel 7 | Channel 8 | Channel 9 | Channel 10 | Channel 11 | Channel 12 | Channel 13 | Channel 14 | Channel 15 | Channel 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6/8/2021 | 13:51:04 | 80 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:51:09 | 80 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:51:14 | 30 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:51:19 | 60 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:51:24 | 80 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:51:29 | 70 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:51:34 | 70 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:51:39 | 40 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:51:44 | 250 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:51:49 | 140 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:51:54 | 120 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:51:59 | 210 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:52:04 | 230 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:52:09 | 180 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:52:14 | 130 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:52:19 | 210 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:52:24 | 100 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/8/2021 | 13:52:29 | 170 | 0 | 0 | 0 | 0 | 20.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

9. Reinstall the SD card with USB adapter into the AirLink 7032's USB slot.

10. Press **Cancel** on the message that appears on the display.

# Chapter 9: Parts List

Table 3 lists the part numbers and descriptions for replacement parts and accessories offered for the AirLink 7032 Gas Monitor.

**Table 3: Parts List**

| Part No. | Description |
|---|---|
| 18-0107RK | Conduit hub (3/4 in.) |
| 51-0040-RED | Strobe/horn, 20 - 28 VDC, Cl. I Div. 1 Zone 1 |
| 71-0560 | AirLink 7032 Gas Monitor Operator's Manual (this document) |

# Appendix A: Relay Operation

Relays are offered in certain RKI devices for the purpose of activating alarms, horns, and other equipment upon the detection of gas.

There are two key terms to remember when using relays.

- Deactivated: refers to a relay in its normal state
- Activated: refers to a relay in an alarm state

## “Dry” Contact and “Wet” Contact Relays

In regards to power, there are two types of relays.

1. Dry Contact Relays: This type of relay does not provide power to the equipment attached to it (i.e. if there is a light hooked up to this type of relay, it must be powered by another source).
2. Wet Contact Relays: This type of relay does provide power to the equipment attached to it (i.e. if a light was hooked up to this type of relay, it would be powered by the relay). When using a Wet Contact Relay, power should run through the “COMM” terminal to the end equipment.

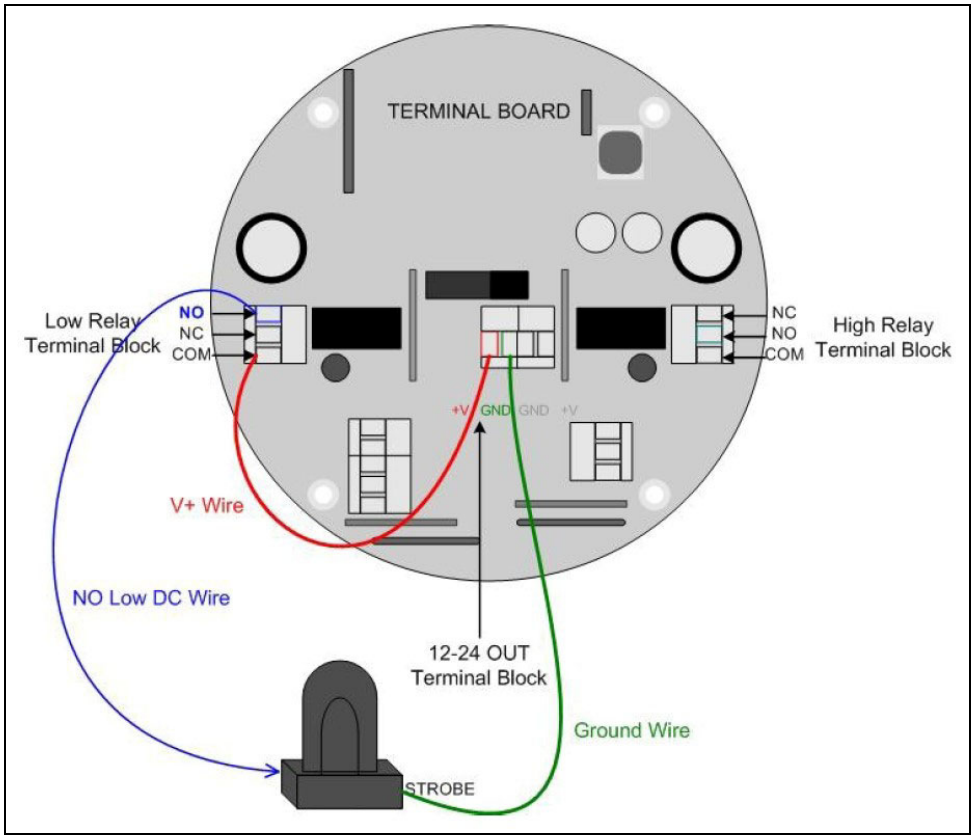



**Figure 13: “Dry” Contact Relay Configured as a “Wet” Contact**

# Failsafe Setting's Effect on Normally-Open/Normally-Closed Contacts

If Failsafe is set to No, the relays are de-energized in normal operation and energize when the appropriate alarm circuit is activated. The NO (normally open) relay contacts are open during non-alarm operation and close when the appropriate alarm condition occurs. The NC (normally closed) relay contacts are closed during non-alarm operation and open when the appropriate alarm condition occurs.

If Failsafe is set to Yes, the relays are energized in normal operation and de-energize when the appropriate alarm circuit is activated. The NO (normally open) relay contacts are closed during non-alarm operation and open when the appropriate alarm condition occurs. The NC (normally closed) relay contacts are open during non-alarm operation and close when the appropriate alarm condition occurs.

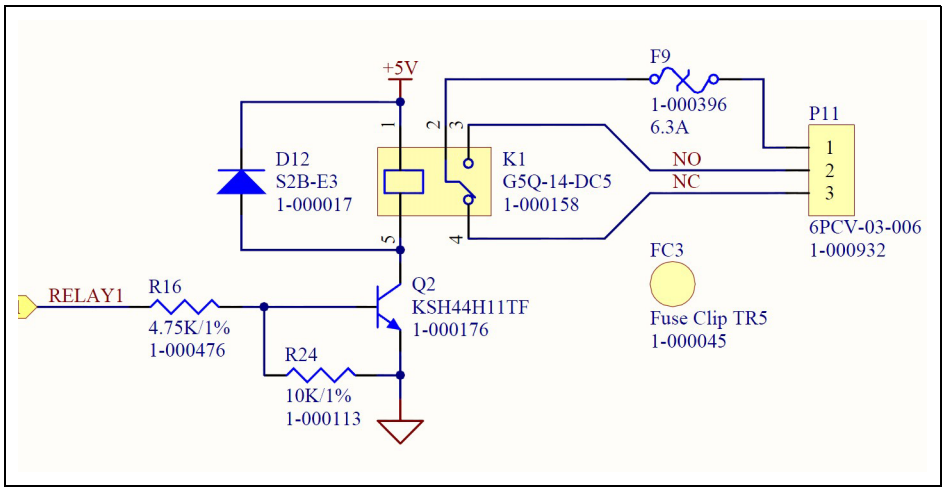



**Figure 14: Relay Circuit Schematic**

# Appendix B: Introduction to 4-20 mA Current Loop Signals

This appendix is only an introduction. The information should serve as a brief overview of 4-20 mA current loop signal ranges and should not be considered a complete reference for proper implementation or use.

Industry standards pertaining to 4-20 mA current loop signals and other aspects of electronics are assumed to be known by the technician. For proper connection to a controller or Programmable Logic Controller (PLC), refer to the manufacturer's specific manual or instructions for that device.

## Overview

When using 4-20 mA wired output signal devices, the 4-20 mA defines the current loop analog signal range, with 4 mA representing the lowest end of the range and 20 mA the highest. The relationship between the current loop and the gas value is linear. In addition, the AirLink 7032 uses values below 4 mA to indicate special status conditions, as shown below:

**Table 4: 4-20 mA Ranges**

| Current | Detector Status |
|---|---|
| 2.5 mA | Sensor Fault |
| 3 mA | Sensor in Menu Mode |
| 3.5 mA | Sensor in Calibration Mode |

The 4 mA allows the receiving controller/PLC to distinguish between a zero signal, a broken wire, or an unresponsive instrument. Benefits of 4-20 mA convention are that it is: an industry standard, low-cost to implement, can reject some forms of electrical noise, and the signal does not change value around the "loop" (as opposed to voltage). The key advantage of the current loop is that the accuracy of the signal is not affected by a potential voltage drop in the interconnected wiring. Even with significant resistance in the line, the AirLink 7032 will maintain the proper current for the device, up to its maximum voltage capability.

Only one current level can be present at any time. Each device that operates via a 4-20 mA current loop signal must be wired directly to the controller. Units that are wired in a daisy chain configuration for the 4-20 mA current loop signal will not properly transmit data communications to the controller.

## Calculations

$$I_{(4\text{-}20)} = \left(\frac{(16)(\text{value})}{\text{scale}}\right) + 4$$

I(4-20) = Current of loop, measured in mA

value = ppm (or %) of gas concentration

scale = full scale of sensor

# Measuring Current

If the value measured is 0 mA, then: the loop wires are broken, the sensor assembly is not powered up, the sensor assembly is malfunctioning, or the controller is malfunctioning. A digital multi-meter (DMM), or current meter, may be used in conjunction with the controller and/or to test the 4-20 mA current loop signal. To measure the current, place the meter probes in line with the current loop.

# Appendix C: RS-485 Modbus Output

## Modbus Terms

Modbus: RTU
Setting: Baud Rate = 9600
Data Bits: 8
Parity: None
Stop Bits: 1
Time Out: 1000 ms
Device Address: 1-247
Data Type: Holding Registers
Start Address: The first register the user would like to view (must be between 1-255)
Length: Depends on the number of addresses the user would like to view
Scan Rate:1000 ms
Data Format: Hex, Decimal, Float

## Register Map

The Modbus register maps for 32 and 64-channel versions (applicable to RS-232, RS-485, and USB outputs) of the AirLink 7010 are accessible from the following URLs:

- 32-channel version: https://www.rkiinstruments.com/pdf/airlink_7032-32-regmap.pdf
- 64-channel version: https://www.rkiinstruments.com/pdf/airlink_7032-64-regmap.pdf