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ALRT-100
Installation Guide
Analog Input Signal "Smart Relay" Alarm with Local LED Indication

Advanced Indoor Air Quality (IAQ) Sensing Technology

Installation Guide

ALRT-100

Analog Input Signal "Smart Relay" Threshold Alarm with Local LED Indication

Model ALRT-100

Document: IG_ALRT-100_R1A

LIST OF EFFECTIVE AND CHANGED PAGES

Insert latest changed pages (in bold text); remove and dispose of superseded pages.
Total number of pages in this manual is **6.**

Page No	Revision *	Description of Change	Date
1 through 8 . . . . .R1A . . . . .Initial document release. 01/11/2016			

* R1A indicates an original page without change

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1. INTRODUCTION AND SCOPE

This Quick Installation Guide provides basic installation instructions and initial setup of the ALRT-100 Threshold Alarm device.

The ALRT-100 accepts a binary analog output signal for applications requiring local or remote visual or contact closure alarming. The ALRT-100 can be configured to accept 0-10VDC, 0-5VDC or 4-20 mA signals. Local alarm status is provided by a front panel LED indicator. The remote alarm output can be set up as dry relay contacts (normally open, close on alarm, rated 30VDC/24VAC @ 3 amperes maximum) or as an external LED driver (15mA typical). The alarm threshold is fixed at 3.0VDC (0-5/0- 10VDC inputs), or 6mA (4-20mA input). The ALRT-100 analog input interface allows an alarm feature to be added to virtually any analog output device that is not alarm capable. The ALRT-100 processes the raw analog signal and provides versatile alarm options for local LED, remote LED drive, and normally open relay dry contacts.

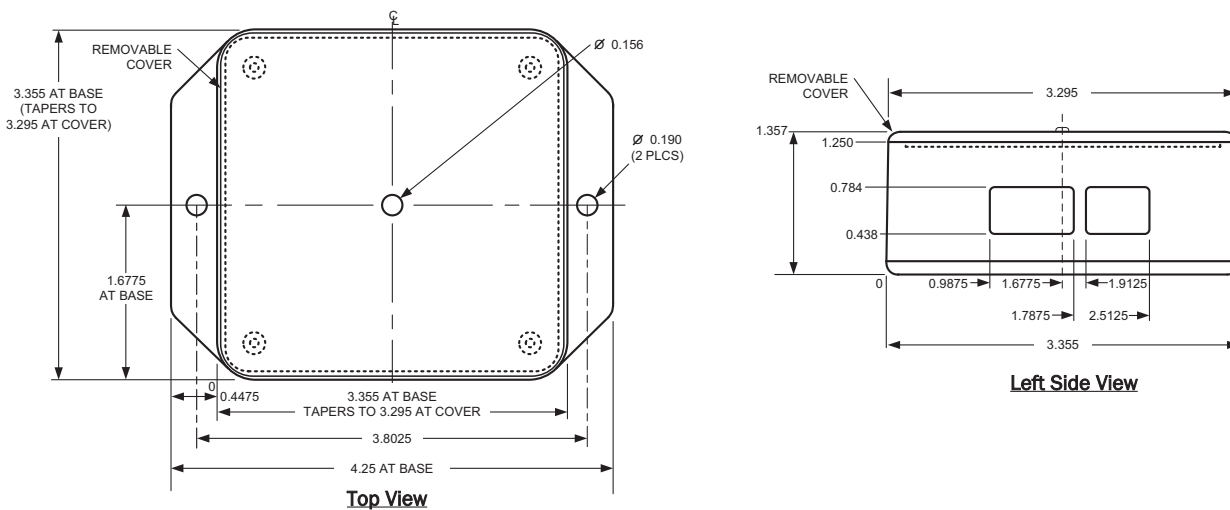Figure 1 provides mechanical details of the ALRT-100.

Figure 1. ALRT-100 Mechanical Detail Drawing

2. INSTALLATION

The ALRT-100 is designed for use in an environment between -20° F to 120° F (-28.8° C to 48.8° C) where it will not be exposed to precipitation. A NEMA-4 enclosure must be provided to protect the ALRT-100 in locations where precipitation may be encountered. The ALRT-100 must be installed in a field accessible location with sufficient service clearance to permit cover removal and wiring access. The enclosure accepts signal and power wiring at the left side of the enclosure. Ensure that the planned location will allow the signal and power wiring to reach the wiring terminal blocks at the bottom of the ALRT-100 enclosure.

<div align="center">

CAUTION

Do not drill into the ALRT-100 enclosure since doing so may damage the electronics.

</div>

2.1 MOUNTING THE ALRT-100

1. Carefully unpack the ALRT-100 and inspect for damage. If damage is noted, immediately file a claim with carrier.
2. Using the engineer's plans, locate where the ALRT-100 will be installed.
3. Remove the two wiring connectors from the ALRT-100 terminal blocks and mark the two mounting holes located on each of the enclosure side flanges as shown in Figure 1.
4. Drill two holes suitable for the hardware that will be used to secure the ALRT-100.
5. Secure the ALRT-100 in two places using suitable hardware.
6. Using the wiring connectors that were removed in step 3, connect signal and power cabling to the ALRT-100 wiring connectors as outlined in the following ALRT-100 WIRING procedure.

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2.2 WIRING THE ALRT-100

ALRT-100 wiring consists of connecting 24VAC input power and the optional alarm output at the ALRT-100. Refer to Figures 2 and 3 for additional detail. Following installation, review the ALRT-100 START UP Procedure.
Wiring connections are accomplished at two removable screw-type terminal block connectors at TB1 and TB2 on the left side of the instrument as shown in Figure 2. The connectors are keyed to prevent improper hookup to the instrument.

2.2.1 24VAC POWER CONNECTIONS

1. Remove the 2 terminal wiring connector TB2.
2. Connect 24 VAC power to TB2 terminal 1, and the 24V ground to TB2 terminal 2 as shown in Figures 2 and 3, observing the following wiring precautions.

CAUTION

Deactivate 24 VAC power source until all connections to the instrument are complete.

The 24 VAC input ground (GND) connection at TB2 terminal 2 is shared with the analog input signal ground at TB1 terminal 2. If isolation is required, a dedicated transformer must be provided to power the ALRT-100.

The ALRT-100 is a non-isolated device with a half-wave rectifier on the 24VAC power input terminal at TB2-1. Therefore, to prevent equipment damage, multiple devices that are powered by a common 24VAC transformer with the ALRT-100 must use common device power connections (e.g. TB2-1 24VAC input power to other device power inputs, and TB2-2 ground to other device grounds), or independent dedicated transformers must be provided for each non-isolated device.

The ALRT-100 24VAC ground and analog input signal returns are common. Therefore it is recommended that the analog input be connected using TWO separate twisted shielded pairs in order to eliminate potential voltage drop on the common (from the 24VAC return) that would otherwise cause inaccurate readings.

To prevent any potential water runoff into the ALRT-100, form "drip loops" with interconnecting wires to the ALRT-100.

Check the physical installation, power connections and wiring prior to application of power to the instrument.

2.2.2 ANALOG INPUT CONNECTIONS

The ALRT-100 accepts an analog input signal of 0-10VDC, 0-5VDC or 4-20mA. The 24VAC return ground connection is shared with the analog input signal ground (GND). If the analog input must be isolated from the 24VAC return, a dedicated transformer must be provided to power the ALRT-100.
1. Remove the 4 terminal wiring connector TB1.
2. Connect the analog input signal wire at TB1-1, and the signal ground at TB1-2 as shown in Figures 2 and 3 while observing the previous wiring precautions.

2.2.3 SELECTING ANALOG INPUT TYPE

Select the analog input type (voltage or current) using the 4-20mA Jumper as follows:
1. Remove the four cover retaining screws at each corner of the transmitter cover as shown in Figure 2.
2. Remove cover from the enclosure.
3. For 0-5VDC and 0-10VDC analog input, remove the jumper across the 4-20mA terminals (or place it on only one of the two pins);
OR
   For 4-20mA analog input, install the jumper across the 4-20mA terminals.

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2.2.4 ALARM OUTPUT CONNECTIONS

In addition to the front panel LED alarm indicator, the ALRT-100 can be configured to provide an alarm output as relay dry contacts, or as direct drive (15 mA typical) for an external LED indicator. The alarm output type is set using the LED PWR jumper on the ALRT-100 main circuit board as shown in Figure 2. With the LED PWR jumper on, the alarm output is set to produce LED drive of 15 mA (typical) to an external LED at TB1 terminal 4, with the LED cathode return at TB2-2. With the LED PWR jumper OFF, the alarm output is configured as dry relay contacts (normally open) to close on alarm between TB1-3 and TB1-4. Contacts are rated at 30VDC/24VAC 3 amps maximum.

2.3 SELECTING THE OPTIONAL ALARM OUTPUT TYPE USING THE LED PWR JUMPER

1. Remove the four cover retaining screws at each corner of the transmitter cover as shown in Figure 2.
2. Remove cover from the enclosure.
3. **For external LED drive alarm output**, install LED PWR jumper, and connect LED anode (+) to TB1 terminal 4, and cathode (-) at Power Connector TB2 terminal 2.
<u>OR</u>
   For relay dry contact alarm output, remove the jumper across the LED PWR terminals (or place it on only one of the two pins), and connect the alarm wires to TB1 terminals 3 and 4. Contact rating is 30VDC/24VAC at 3 amps maximum.

3. ALRT-100 START UP

3.1 General

To ensure successful start-up, verify that the ALRT-100 has been installed and wired in accordance with the previous installation and network setup instructions.
Upon application of 24VAC power, the ALRT-100 is ready for normal operation. Verify initial operation as follows:
1. Activate 24VAC power to the ALRT-100.
2. Verify that with an analog input of greater than 3.0VDC or 6mA, the front panel alarm LED (and remote alarm output) is activated. If alarm is not active, remove power to the ALRT-100 and re-check all wiring connections.
3. Verify that with an analog input of less than 3.0VDC or 6mA, that the front panel alarm LED (and remote alarm output) remain inactive (LED is OFF). If alarm is active, remove power to the ALRT-100 and re-check all wiring connections to the device.
4. The ALRT-100 is now ready for normal operation.

4. FOR ADDITIONAL INFORMATION

For additional information on the ALRT-100 product, contact the EBTRON Solutions team at 1-800-2EBTRON (1-800-232- 8766).
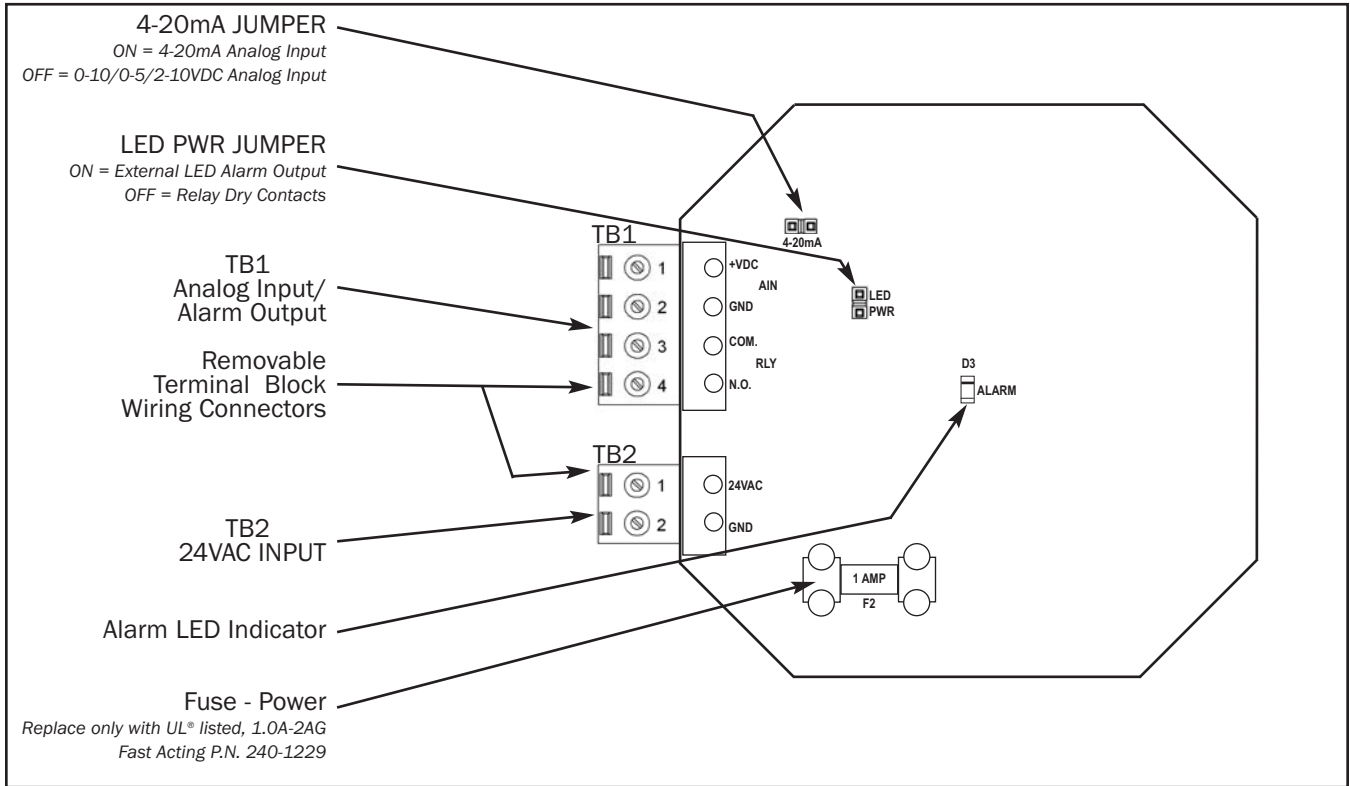
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®
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4-20mA JUMPER
ON = 4-20mA Analog Input
OFF = 0-10/0-5/2-10VDC Analog Input

LED PWR JUMPER
ON = External LED Alarm Output
OFF = Relay Dry Contacts

TB1
TB1 Analog Input/ Alarm Output

Removable Terminal Block Wiring Connectors

TB2

TB2 24VAC INPUT

Alarm LED Indicator

Fuse - Power
Replace only with UL® listed, 1.0A-2AG Fast Acting P.N. 240-1229

4-20mA

LED PWR

TB1
1 +VDC
AIN
2 GND
3 COM.
RLY
4 N.O.

D3 ALARM

TB2
1 24VAC
2 GND

1 AMP F2

Figure 2. ALRT-100 Main Circuit Board Detail

ANALOG OUTPUT DEVICE
+ ANALOG OUTPUT SIGNAL (TO TB1-1)
- ANALOG OUT COM GROUND (TO TB1-2 – SEE NOTES 2, 3)

ANALOG SIGNAL TO BE MONITORED

ALRT-100 ALARM UNIT
TB1
1
2
3
4

LED PWR JUMPER

LED PWR JUMPER REMOVED		LED PWR JUMPER INSTALLED	
TB1		TB1	
1	ANALOG INPUT SIG	1	ANALOG INPUT SIG
2	ANALOG GROUND	2	ANALOG GROUND
3	ALARM RELAY COM	3	NO CONNECTION
4	ALARM RELAY DRY CONTACT	4	ALARM LED (+15mA)

TB2
1 24VAC POWER IN
2 24V GROUND

TB2
1
2

RELAY ALARM CONTACTS
(LED PWR JUMPER 'OFF')

ALARM RELAY COMMON **(ONLY WHEN LED PWR JUMPER IS REMOVED)**
COM
RELAY DRY CONTACTS 30VDC/24VAC @ 3 AMPS MAX)
ALARM RELAY DRY CONTACT **(ONLY WHEN LED PWR JUMPER IS REMOVED)**
DRY

EXTERNAL LED ALARM INDICATOR
(LED PWR JUMPER 'ON')

ALARM LED SIGNAL (**ONLY WHEN LED PWR JUMPER IS ON**)
EXTERNAL ALARM LED (15 mA) ILLUMINATES ON ALARM
ALARM LED GROUND (**ONLY WHEN LED PWR JUMPER IS ON**)

NOTES:
1. CONNECT ANALOG SIGNAL CABLE DRAINS TO EARTH GROUND AT ONE END OF CABLE ONLY.

2. THE ALRT-100 IS A NON-ISOLATED DEVICE USING A HALF-WAVE RECTIFIER ON THE 24VAC POWER INPUT. IF MULTIPLE DEVICES ARE POWERED BY THE SAME TRANSFORMER OUTPUT, ALL GND CONNECTIONS MUST BE COMMON, OR AN ISOLATION TRANSFORMER MAY BE USED TO PREVENT EQUIPMENT DAMAGE.

3. ALL DEVICES ON MULTIPLE ALRT-100 INSTALLATIONS WITH A COMMON 24VAC SOURCE MUST BE WIRED IN-PHASE TO THE SAME TERMINALS (e.g.: TB2-1 to TB2-1, TB2-2 to TB2-2).

4. SHIELDED TWISTED PAIR (STP) WIRING IS RECOMMENDED (SUPPLIED BY OTHERS).

TRANSFORMER
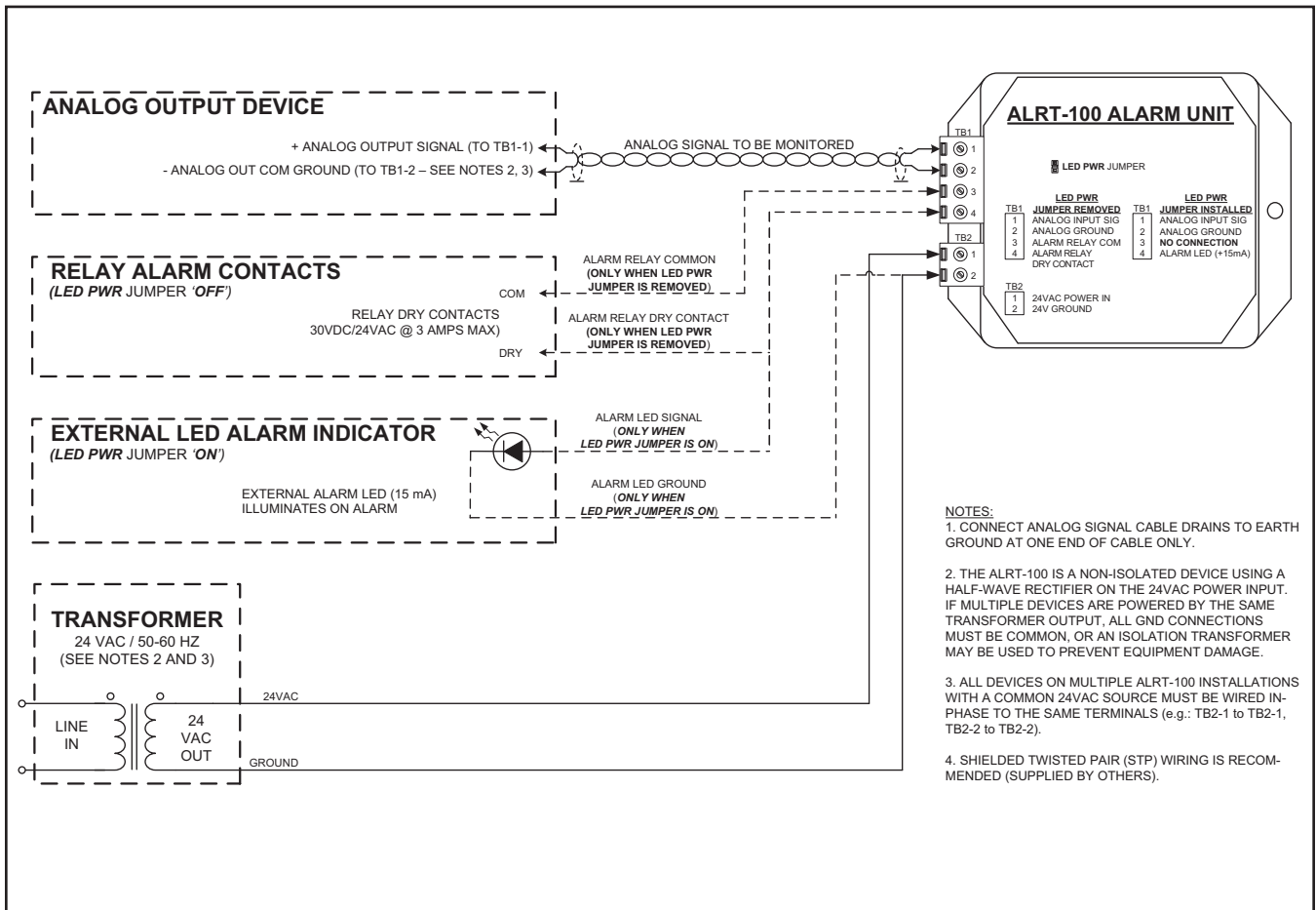24 VAC / 50-60 HZ (SEE NOTES 2 AND 3)

LINE IN
24 VAC OUT
24VAC
GROUND

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Figure 3. ALRT-100 Wiring Diagram Detail

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