



## Fixed System Installation



## Mounting the Controller

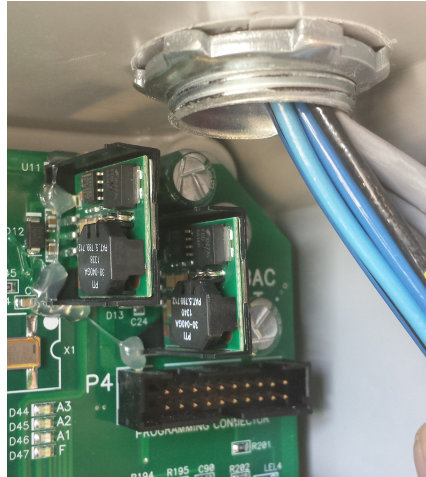


- Make sure there is sufficient space to mount controller.
- Make sure that door can be opened.
- Mount for easy access and visibility.
- Always use conduit hubs to route wires.

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## Controller Wiring



- Do not drill the top case and run power wires into the unit.
- Noise from wiring will cause controller to malfunction.
- Condensation may drip down conduit and damage PCB.

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## Grounding



- Proper grounding is essential to proper system operation.
- Connect transmitter wiring shields to the ground terminal on main PCB or conduit hubs.
- Grounding at transmitter and controller may create a ground loop.

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## Transmitter Mounting

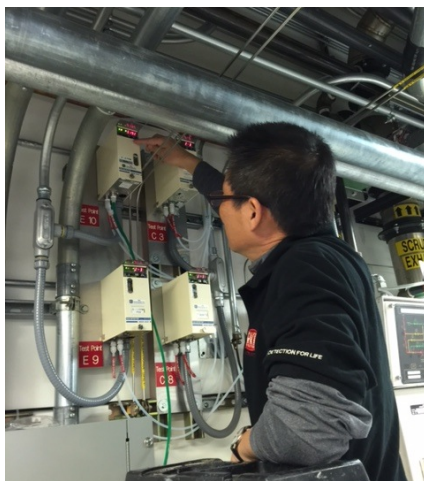


- Mount transmitter at eye level.
- Avoid mounting transmitters in areas of high vibration, extreme heat or cold.

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## Transmitter Mounting



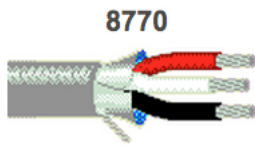
- Mount transmitter in a location that can be easily accessed.

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## Transmitter Wiring

### Belden Cable



- Use proper wire for each transmitter.
- Use the proper gauge wire for the distance needed.
- Insulated, shielded and jacketed cable.
- Follow local installation codes.

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## Transmitter Mounting



- Mount transmitters properly.
  - Lighter gases such as methane on ceiling.
  - Heavier gases such as propane, mount near floor.
  - Always place transmitter as close as possible to potential leak source.

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## Transmitter Mounting

### Clean Installation



- Transmitters mounted in the breathing zone for general area monitoring.
- Transmitter labeling makes identification easy.

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## Transmitter Sample Lines



- Use PTFE tubing (Teflon®) when detecting reactive gases.
- Keep sample tubing length as short as possible.
- Line filters protect pump and sensor from damage.

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## Sealing Conduit



- For outdoor installations, seal threads to prevent water intrusion.
- Install conduit seal to prevent water from entering into housing.

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## Remote Cal Adapter



- Makes calibration simple for sensors that are mounted in locations that are difficult to access.

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## Battery Backup



- Battery backup will power controller and sensors during a power outage.
- Source proper battery back up to provide necessary current.

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## Recording Devices

- Recording devices can provide data on exposure over time.
- Make sure that recording devices are compatible with controller output.

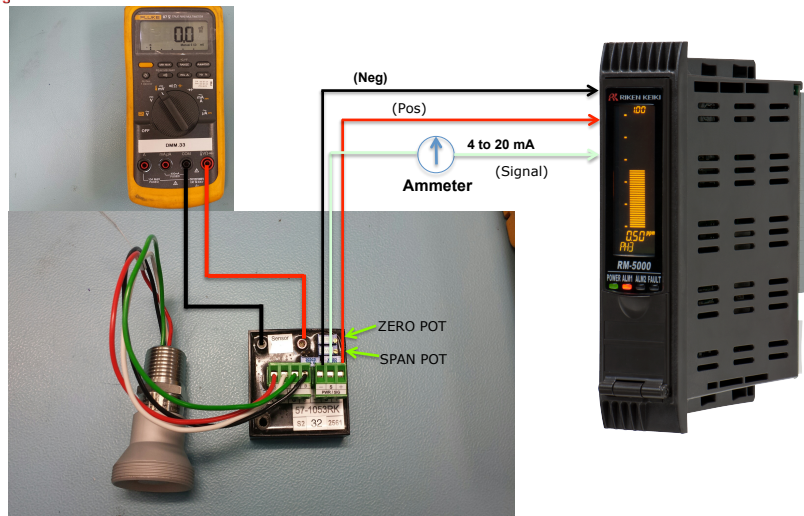


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- RKI Instruments have several communication protocols:
  - 4 to 20 mA (most common)
  - Direct connect (can be used on all controllers except Beacon 800)
  - Modbus (found on M2A's)
  - PoE (Special order GD-70D's only)

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## 4 to 20mA Communication

- For combustible or toxic gases, set zero to 100mV with fresh air applied.



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## 4 to 20 mA Communication

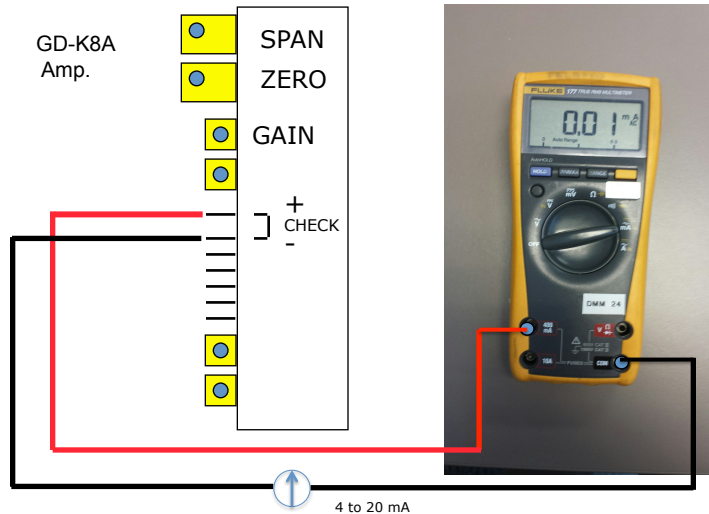


- When setting the span to 50% LEL, adjust the SPAN pot so DVM reads 300mV.
- Formula:
  - (Cal gas/Full Scale) x 400 + 100 = mV setting

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## 4 to 20 mA Communication



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## Calculations

- Standard S-Type Transmitter
  - Oxygen:  $20.9/\text{full scale} \times 400 + 100$ 
    - Oxygen calibration setting in mV
  - Combustible & Toxic:  $(\text{Cal gas}/\text{full scale}) \times 400 + 100$ 
    - Combustible/toxic span setting in mV
- Current Source Amplifier
  - Toxics:  $(\text{Cal gas}/\text{full scale}) \times 16 + 4$ 
    - Toxic span setting in mA

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## Direct Connect

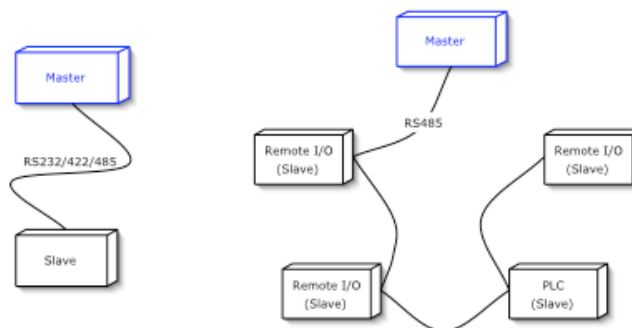


- Sensor directly wired to controller.
- No amplifier housing.

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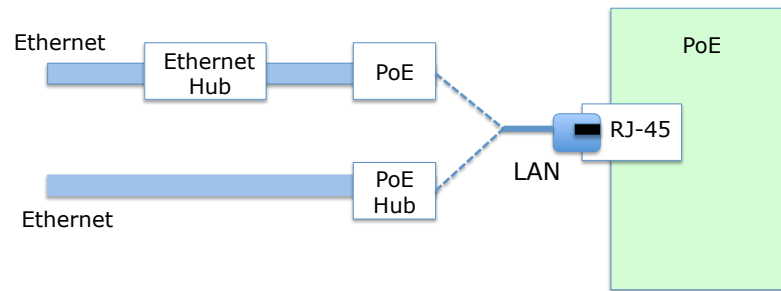


## Modbus



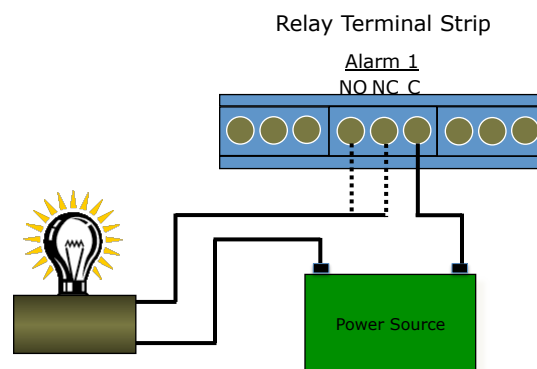
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## PoE



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## Relays



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## Area Classifications

NEC Division System Gas Groups		
Area	Group	Representative Materials
Class I, Division 1 & 2	A	Acetylene
	B	Hydrogen
	C	Ethylene
	D	Propane
Class II, Division I & 2	E (Division 1 only)	Metal dusts, such as magnesium
	F	Carbonaceous dusts, such as carbon & Charcoal
	G	Non-conductive dusts, such as flour, grain
	None	Ignitable fibers/flyings, such as cotton lint, flax & rayon

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## Questions?

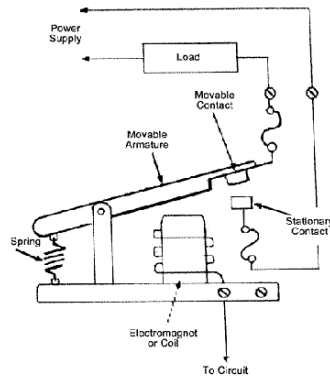


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## Relays

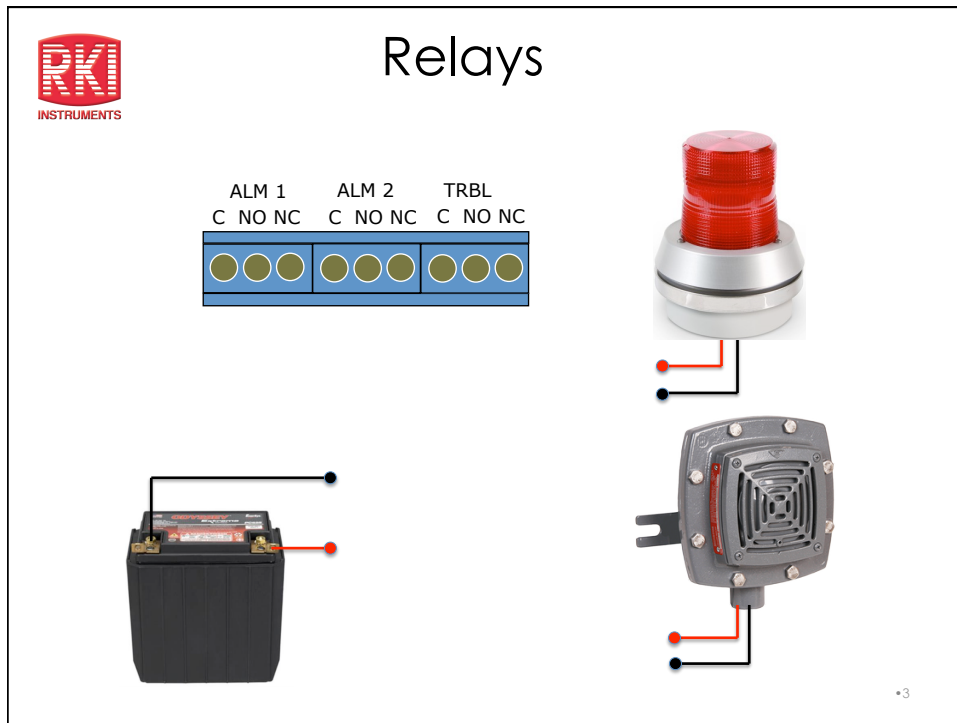
- Form A
  - Common & Normally Open Contact
- Form B
  - Common & Normally Closed Contact
- Form C
  - Common, Normally Open and Normally Closed Contacts



## Relays

- Dry contacts
  - Not powered
- Current ratings are critical
  - Verify that relay meets current capacity.
  - Use “Slave” or high power relay option on Beacon 800 to switch large loads.
- Use diode or Transient Voltage Suppressor (Tranzorb) to negate stored energy in high power relays to prevent damage.

\*2





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