

1. Before You Begin

WARNING!

Ensure installation of the system meets applicable state and national electrical code requirements.

The installation of the system should only be performed by a qualified installer.

To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.

When connecting the device to an external power supply, do not exceed the defined voltage: 9-30 Vdc max.

Power must be disconnected or turn off prior to attaching or removing any I/O Modules from the system – failure to comply may cause damage to the I/O Module(s).

Contains no user serviceable parts. Unauthorized modification to device or supplied accessories may damage devices and void warranty.

This device is not intended for use on processes that have the potential to generate high vibration levels that would adversely impact product performance or life.

The WIO® System must be installed within an enclosure that requires a tool to access. This is to prevent inadvertent disconnection of any of the power wiring, signal wiring or communication cables.

EXPLOSION HAZARD. Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

This equipment is designed for use in Class I, Division 2 (Zone 2) or non-hazardous locations only.


2. Required Items

- BM-xxxx-RM1K with all supplied mounting hardware
- At least one matching pair of WIO I/O Modules
- Technician's screwdriver (flathead)
- 2x 9-30 Vdc power sources
- 2x 35 mm standard DIN rails (35 x 7.5 mm)
- 2x NEMA 4X-type enclosures for outdoor installation
- 2x antennas (must match system's RF type)
- 2x low loss antenna cables, SMA to N (male)
- 2x low loss antenna cables, N to N (male) (optional)
- 2x lightning arrestors (strongly recommended for outdoors)
- Weatherproofing tape/seal material
- Wire (solid/stranded AWG 28-12 gauge)

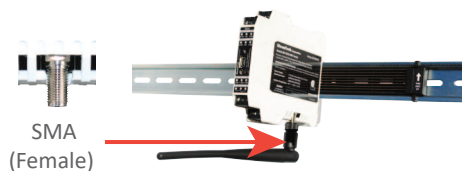
3. System Setup Instructions

1. Attach supplied DataRail® and End Terminal Bracket to a 35 mm x 7.5 mm DIN rail.




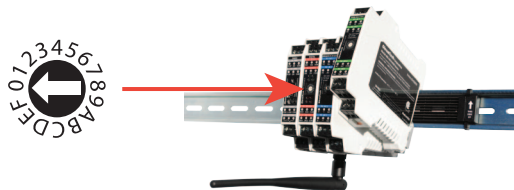
Attach Components from Left to Right without any Gap 


2. Attach Radio Module to DataRail and connect Antenna. Using Lightning Arrestors are strongly recommended.




3. Attach I/O Module(s) and set/match Module IDs.

-  Each pair of I/O Modules must be set to the same, unique ID number.



-  Always disconnect power when attaching or detaching I/O Module(s) to or from DataRail to avoid damage.

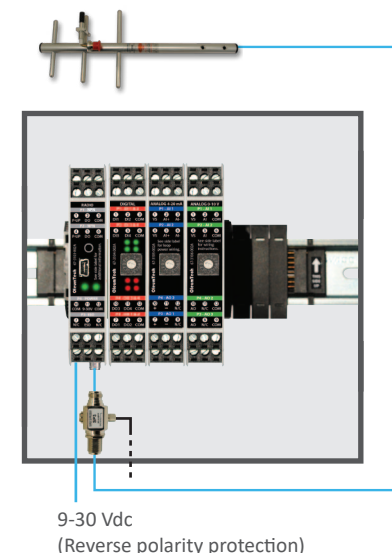
-  When using more than a 5-Module combination per Radio Module, use Power Budget Calculator to determine maximum I/O Module capacity. <http://goo.gl/t67r3k>

4. Cover unused DataRail slots for added protection.



5. Terminate I/O and Supply Power as Required. Use Solid or Stranded Wire (AWG) 28-12.

4. Installation Best Practices



1. Perform a RF survey prior to installation.
2. Use high quality antennas and low-loss cables and fittings for achieving the best possible wireless performance.
3. Having a clear line of sight between antennas (Fresnel zone) is ideal for achieving best RF signal quality.
4. When setting up and installing antennas, avoid walls, tall buildings, trees, and other solid obstructions for improving RF signal quality.
5. Install antennas at least 10 ft above ground when possible.
6. When using directional antennas, be sure to point the antennas at each other and be sure to use correct antenna orientation.
7. Be sure to install omni-directional antennas in vertical position or perpendicular to the ground.
8. Be sure that there are no loose connections. Securely tighten all cable connections and wire terminals.
9. Be sure to waterproof all exterior cable connection using high quality sealing tape.
10. Installing lightning arrestors are strongly recommended.
11. Make a hole at the bottom of the enclosure to run wires and cables.

5. Hardware & Wiring Diagrams

RADIO

P1 - I/O LINK ALARM - NPN

+5V DO

10K 30 V MAX OPTIONAL

DI COM

P2 - RF LINK ALARM - NPN

+5V DO

10K 30 V MAX OPTIONAL

DI COM

P4 - POWER

COM 9-30V COM

Reverse Polarity Protected

P3 - ESD - DRY CONTACT INPUT

COM 8 DI COM

Allows Manual FailSafe Override of Local Outputs

A - Tx Button (1 Sec / Turbo)
Press and hold for 1 second to switch between modes

B - Mini-USB
Avoid ESD Damage: Connect USB to PC Before Connecting Mini-USB

C - RF LED
Green - RF Traffic
Yellow Flashing - RF Failure
Yellow Solid - ESD Active

D - I/O LED
Green - Modules Detected
Red - I/O Link Failure

DIGITAL

P1/P2 - INPUTS

INPUT 1/3 2/4 COM

Accepts Dry Contact or 30 V Max

P3/P4 - OUTPUTS

OUTPUT 1/3 2/4 COM

1 Amp Sink Current for Open-Drain Outputs / NPN

Relay Type: 30 V Input / 5-30 V / 1 Amp Output

FAILSAFE OPERATION

DIP SWITCHES

Enable / Disable

OFF Default ON

DO 1 DO 2 DO 3 DO 4

FailSafe State

When Enabled:
FailSafe Mode selected for Output. Select On or Off.

When Disabled:
Normal Mode selected for Output. Outputs last received value.

FailSafe State:
Turns output to on or off when FailSafe enabled.

A - Input LEDs
Illuminated When Active

B - 16-Position ID Switch
For Matching Module ID

C - Output LEDs
Illuminated When Active

ANALOG 4-20 mA

P1/P2 - INT. LOOP POWER

VS+ SIG COM

+13.5V - SENSOR

DIP SWITCH N/C ON

5 Modules max per Radio when using Internal Loop Power

P1/P2 - EXT. LOOP POWER

VS+ SIG COM

N/C DIP SWITCH OFF

SENSOR - EXT. POWER +

P1/P2 - INPUTS

VS+ SIG COM

P3/P4 - OUTPUTS

+ - N/C

EXT. POWER

A - 16-Position ID Switch
For Matching Module ID

B - Dip Switches
Internal/External Loop Power

OFF Default ON

A12 A11

$VS/External\ Power\ (min) = 10 + Max\ Current\ (Amp) * Loop\ Impedance$

ANALOG 0-10 V

P1/P2 - INPUTS

+13.5V SIG COM

SENSOR

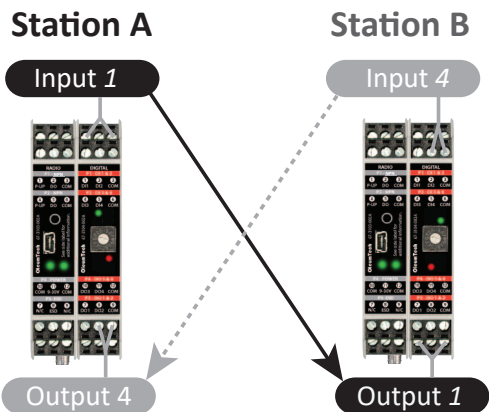
P3/P4 - OUTPUTS

AO N/C COM

AI DEVICE

A - 16-Position ID Switch
For Matching Module ID

6. I/O Chain Diagram



7. Power Consumption

TYPE	POWER CONSUMPTION
RADIO	35 mA @ 12 Vdc AVG (10% Duty Cycle)
DIGITAL	26 mA @ 12 Vdc MAX
4-20 mA	83 mA @ 12 Vdc MAX
0-10 V	58 mA @ 12 Vdc MAX

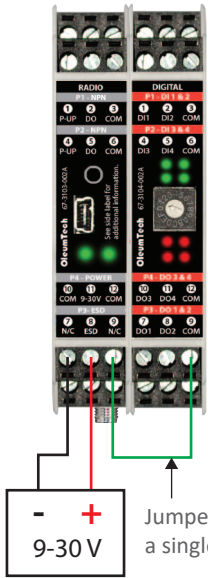


All inputs and outputs on I/O Modules provide field isolation. Please wire accordingly.



Always disconnect power when attaching or detaching I/O Module(s) to or from DataRail to avoid damage.

8. Isolation vs Non-Isolation

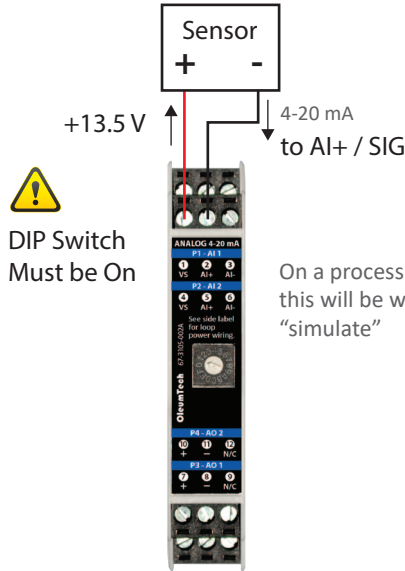


If isolation is required, then separate power sources are required for Radio Module and I/O Module(s).

If isolation is not required, a jumper is required to make common with Radio Module's power supply to one of I/O Module's COM pin.

Jumper required if using a single power source.

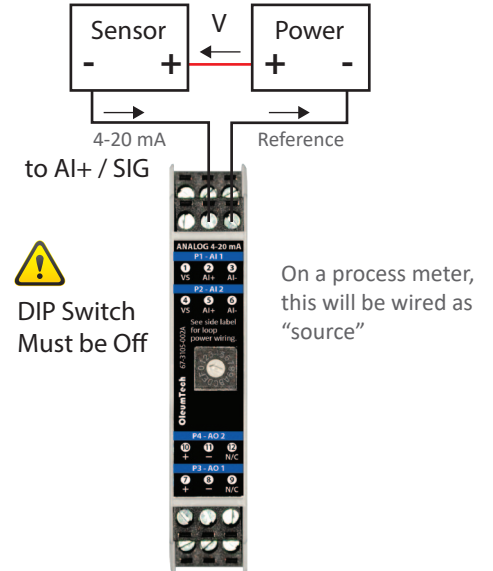
9. 4-20 mA Internal Power Loop



DIP Switch Must be On

On a process meter, this will be wired as "simulate"

10. 4-20 mA External Power Loop



DIP Switch Must be Off

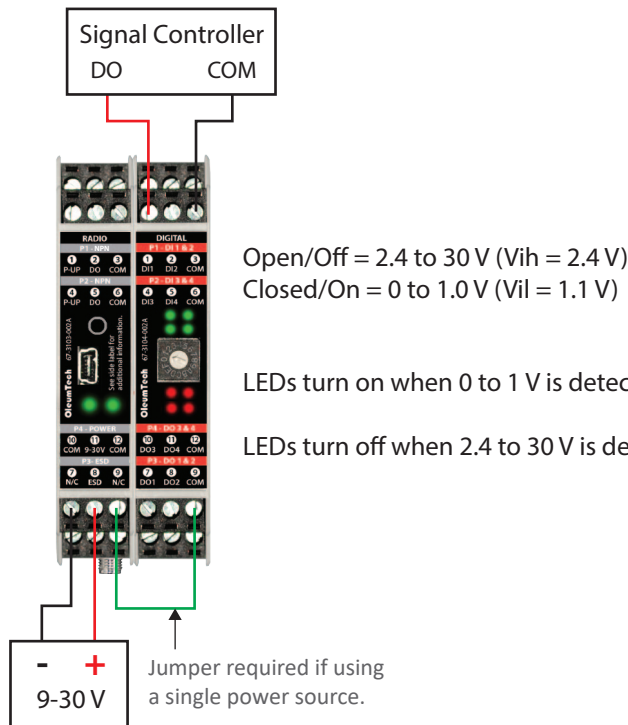
On a process meter, this will be wired as "source"

11. Dry Contact Input



Jumper required if using a single power source.

12. Digital Level Input - Active Low

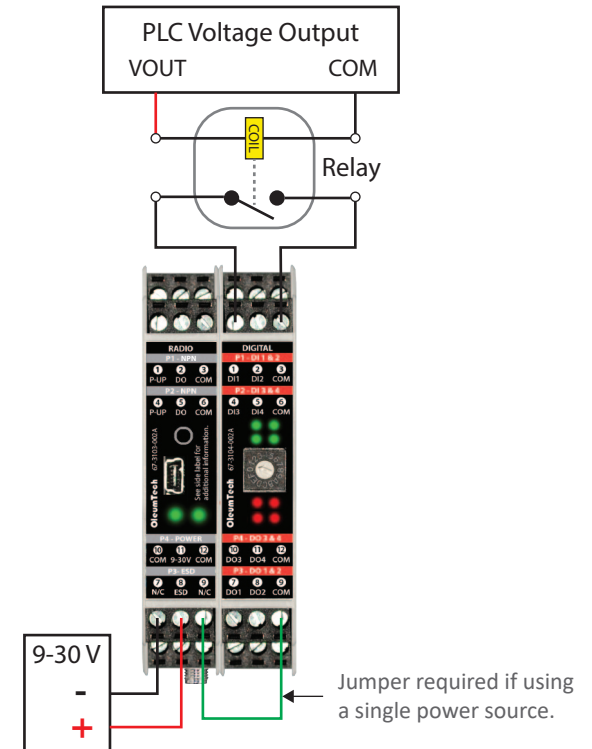


Open/Off = 2.4 to 30 V (Vih = 2.4 V)
Closed/On = 0 to 1.0 V (Vil = 1.1 V)

LEDs turn on when 0 to 1 V is detected

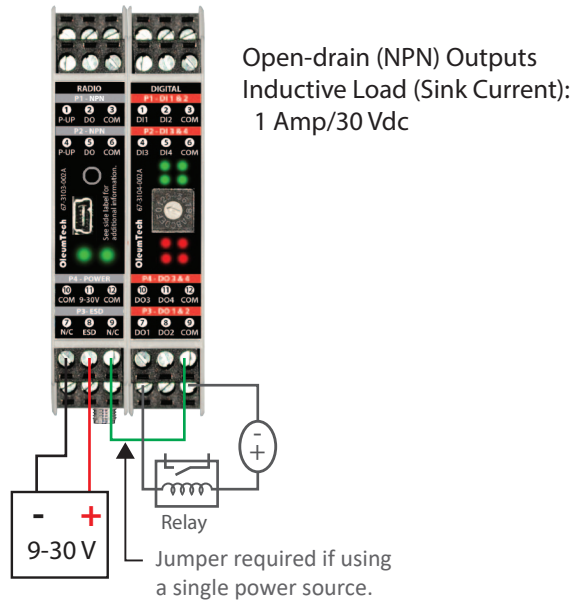
LEDs turn off when 2.4 to 30 V is detected

13. Digital Level Input - Active High

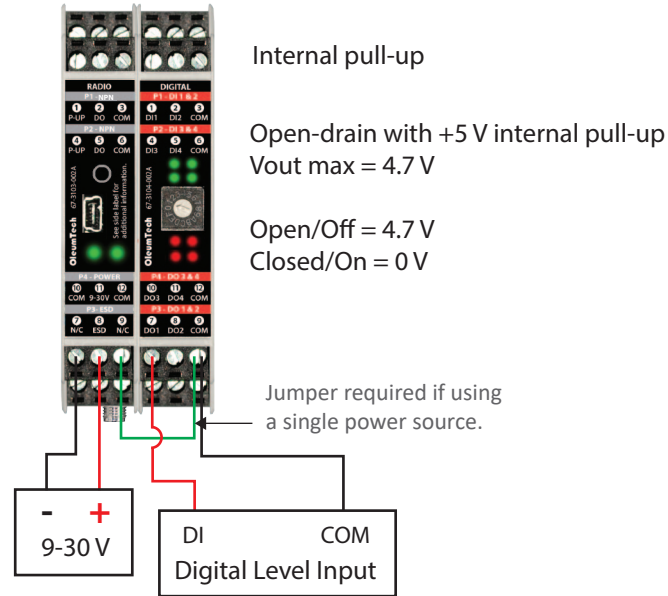


Jumper required if using a single power source.

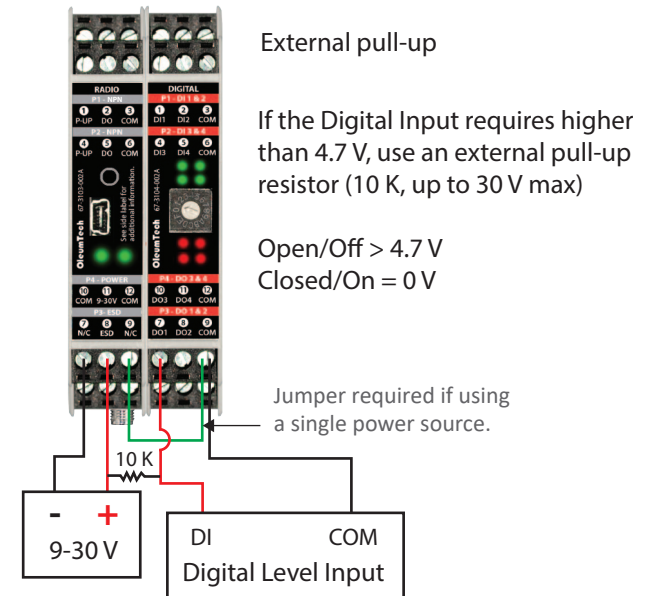
14. NPN Output



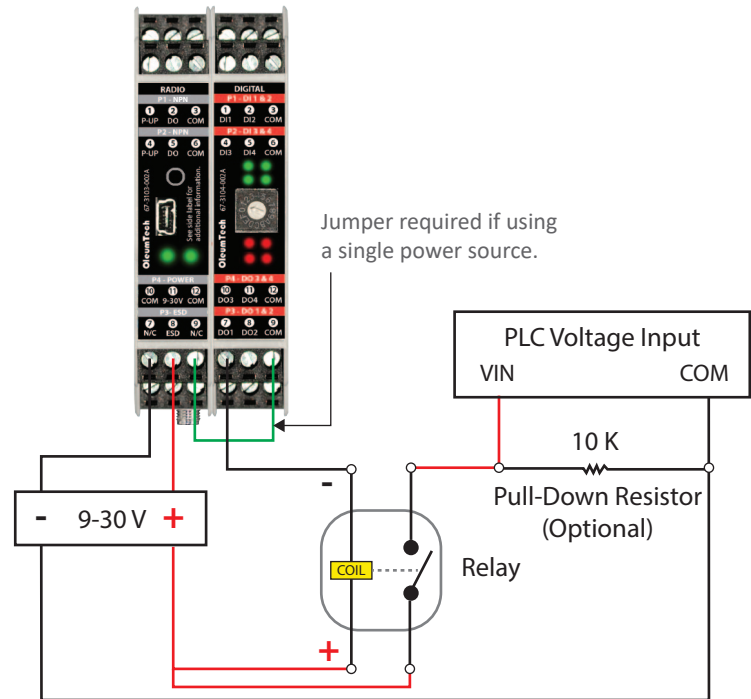
15. Digital Level Output - Active Low



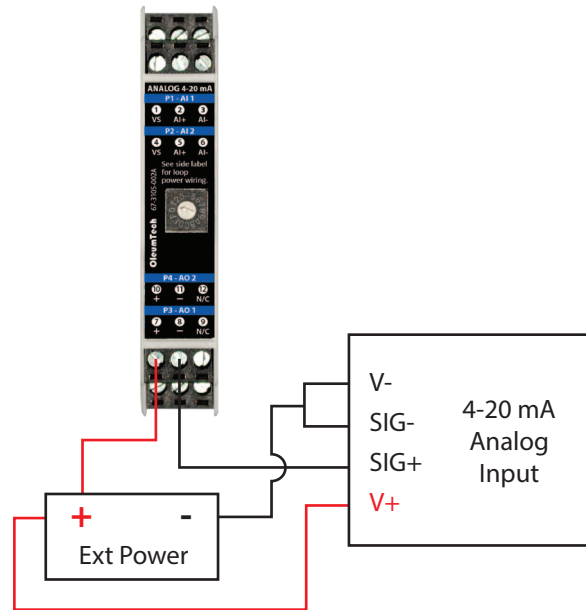
16. Digital Level Output - Active Low



17. Digital Level Output - Active High



18. 4-20 mA Output



Go to wio.oleumtech.com to download the full User Guide for detailed installation and other helpful information. Advanced User Interface Software is also available at the site for download.

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