KLS'S GOGTE INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MECHANICAL ENGINEERING

CREINTORS AUTOMATION SOLUTIONS PVT.LTD.

PRESENTS

HONOR'S PROGRAM IN PLC PROGRAMMING

Syllabus of Course

1. Basics of PLC

2. PLC Programming

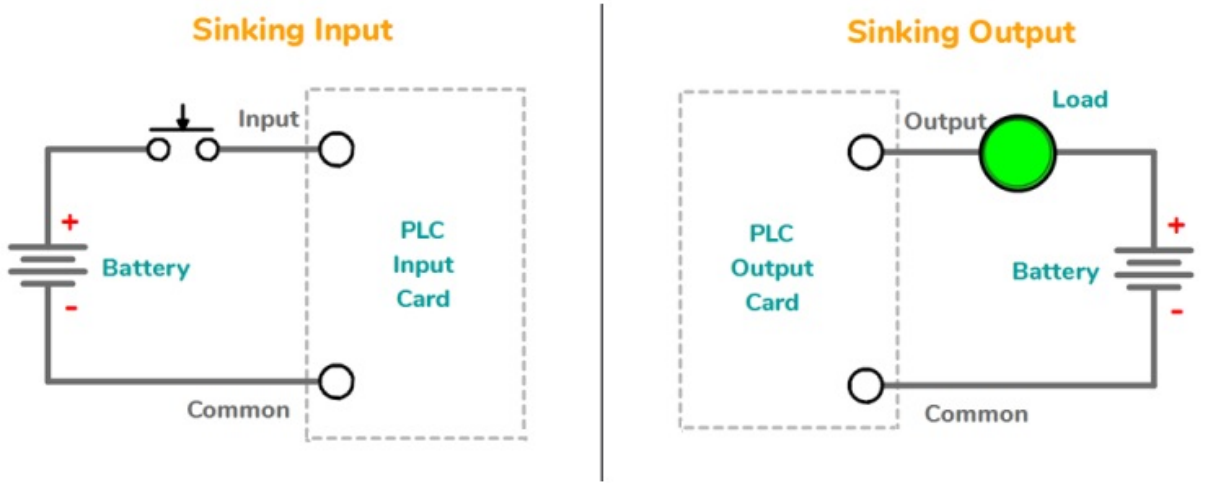
3. SCADA Programming

PLC - Sink/Source

PLC systems use Input/Output cards to read the signal or send the signal to the field devices. These Input/Output cards are either sinking or sourcing cards.

Sinking Input and Output

"Sinking means internally connected with the common (-ve terminal)"



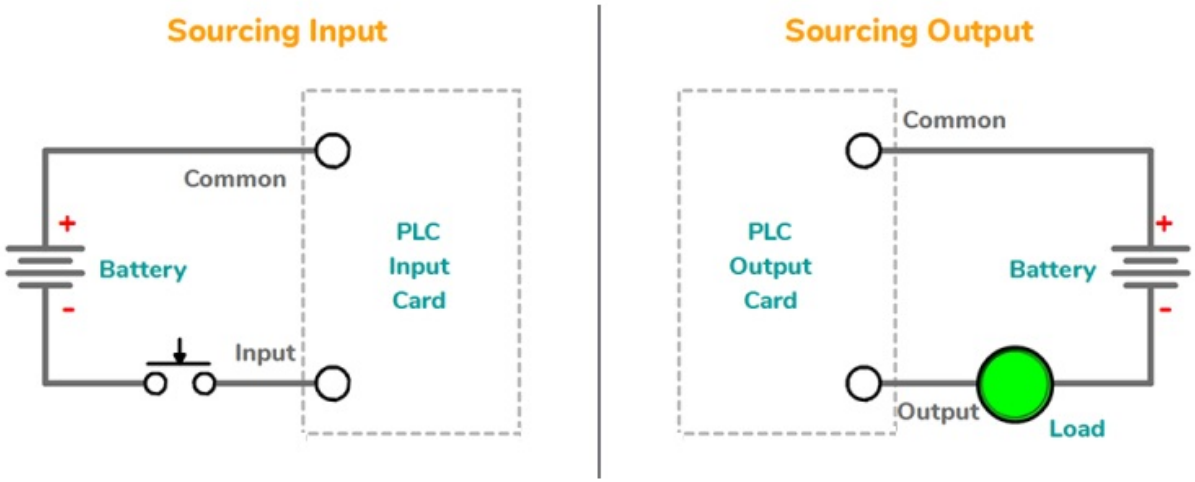
An input or output card wired internally to common is typically regarded as a sinking input or sinking output card.

A sinking input card requires power to be sourced to the input to turn it "ON". The same way a sinking output card requires power to be sourced to the load to turn it "ON".

PLC - Sink/Source

Sourcing Input and Output

"Sourcing means internally connected with the source (+ve terminal)"



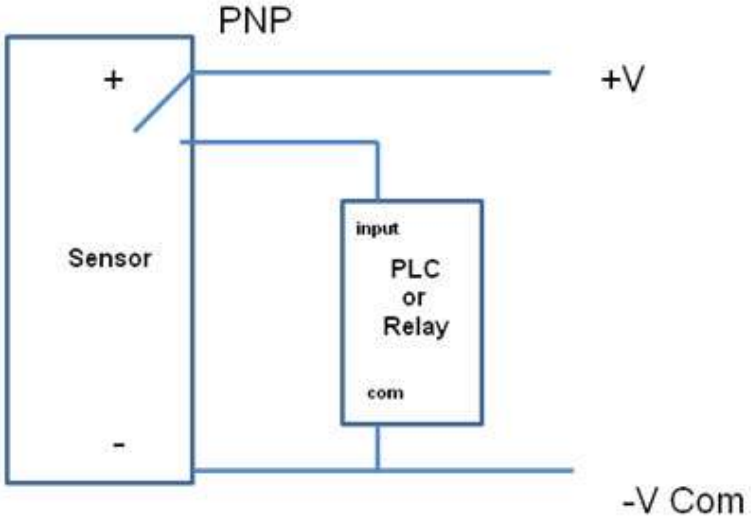
An input or output card connected directly to power, it's typically called as sourcing input or sourcing output card.

A sourcing input card required a ground connection to the input to turn it "ON", same way a sourcing output card requires a ground connection to the load to turn it "ON".

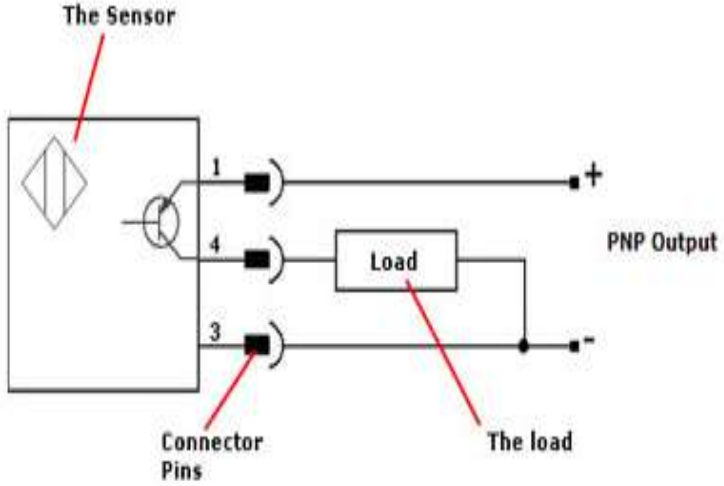
What is PNP / NPN

What is PNP sensor?

PNP are sourcing sensors and allow current to flow out from the sensor, from V+. When it senses an object it will connect the output to the positive supply.



PNP 3-wire Standard Diagram



3 wire PNP wiring

What is PNP / NPN

What is NPN sensor?

NPN are sinking sensors, these allow current to flow into the sensor aand to V-. When it senses an object it will connect the output to the negative supply

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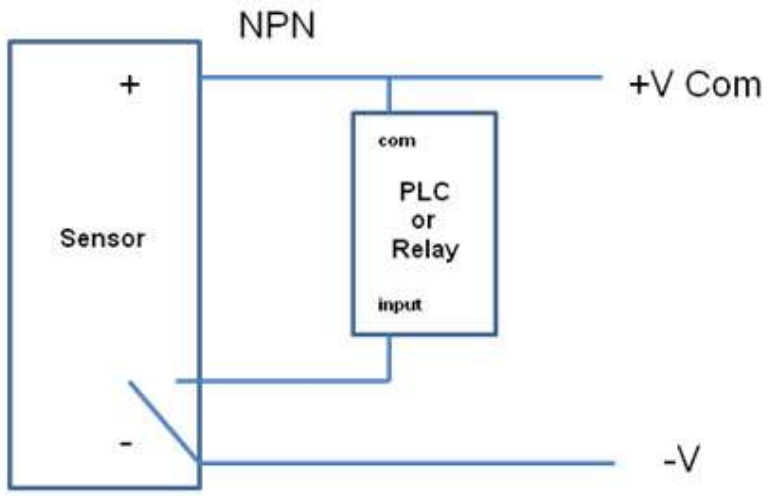
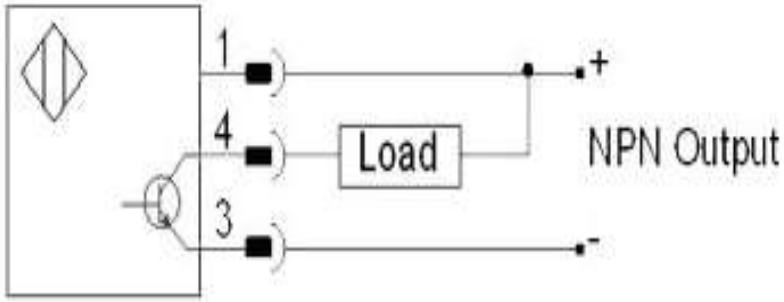


NPN 3-wire Standard Diagram



3 wire NPN wiring

Instruments with Analogue Output Signals

We get lots of Analogue sensor for Pressure / Temperature / Level measurement with output of 4 - 20mA / 0 - 10V / 0 - 20mA.

Pressure Transmitter

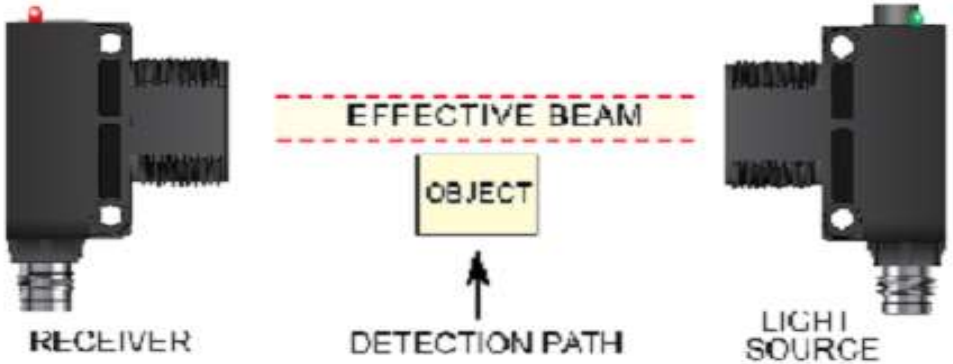
Level Transmitter

Ultrasonic Level Transmitter

Temperature Transmitter

Ultrasonic Distance Transmitter

Draw Wire Type Transmitter



Through Beam Transmitter

Analogue Sensor With Output To Be Used

Why peoples preferred 4 - 20mA over 0 - 10V and 0 - 20mA signal?

The 0-10 V signal has tendency to drop because of line resistance. If the distance between sensor and input card is more the signal will not properly represent the field value.

The 4-20 mA will travel a long distance without dropping signal value.

With 0- 20 mA you can not distinguish between minimum field value and connection break. With 4-20 mA, internal circuit can distinguish between connection break of minimum value.

Normally when the value is minimum the transmitter will give you 4 mA while in case of connection breakage it will give 0 mA.

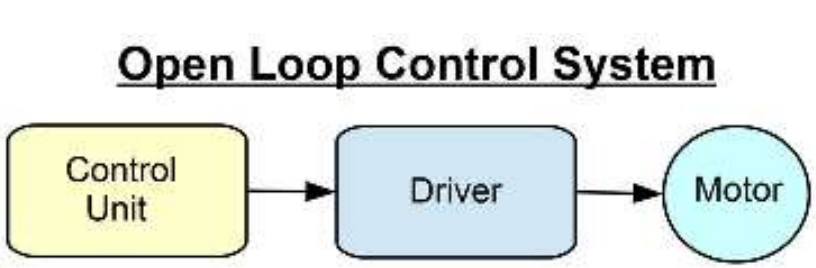
Control Systems

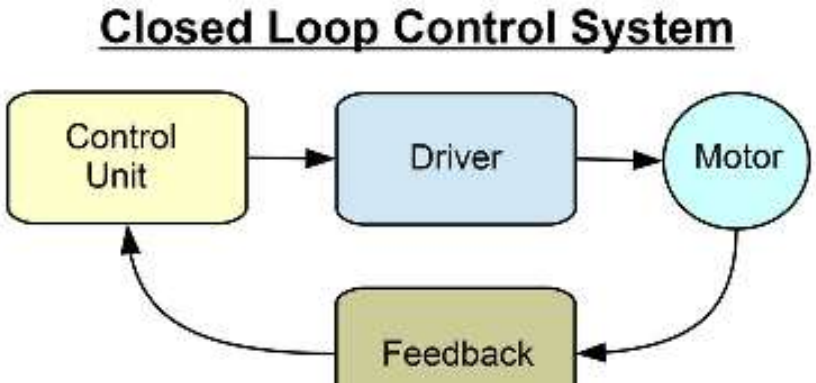
There are two types of control systems namely:

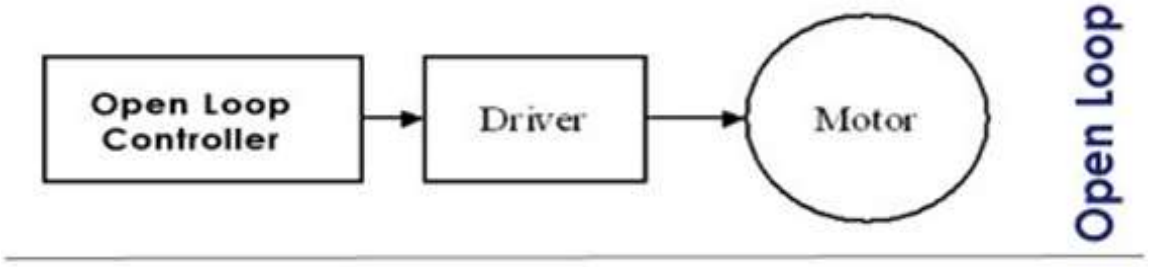
1. Open loop control systems (non-feedback control systems)
2. Closed loop control systems (feedback control systems)

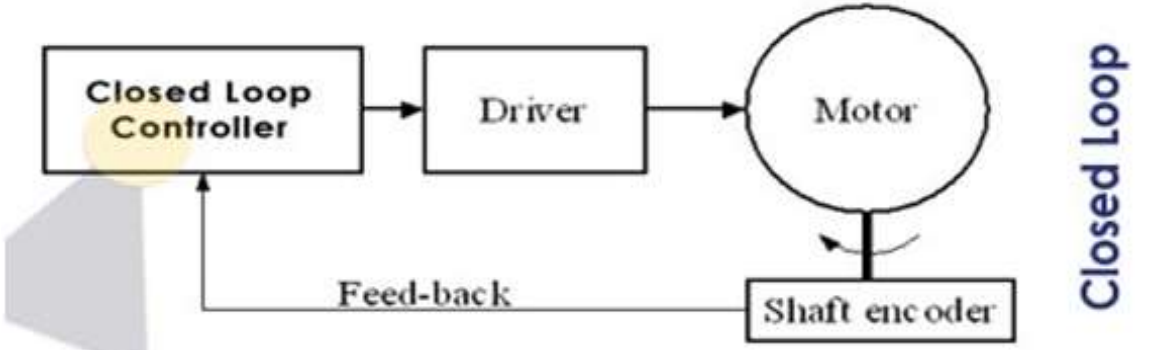
An open loop control system acts completely on the basis of input and the output has no effect on the control action.

A closed loop control system considers the current output and alters it to the desired condition. The control action in these systems is based on the output.










THANK YOU