Industrial Shields®

KNOW-HOW · CHECKLIST

# Digital input not reading: NPN or PNP in 6 checks

When the sensor LED changes but the PLC input does not, the cause is almost always the sensor type, the input common or the voltage level. Check in this order.

| Check | What to do | Good result |
|---|---|---|
| **1. Sensor type** | Read the label: PNP or NPN, NO or NC | You know the sensor output type |
| **2. Input type** | Check which sensors the PLC input accepts | The input type matches the sensor |
| **3. Wiring** | 3-wire sensor: brown to +V, blue to 0 V, black to the input | Each wire in its place |
| **4. Voltage at the input** | Measure input to common, sensor on and off | Above ON level when on, below OFF level when off |
| **5. Common reference** | Check that sensor supply and input common are the same circuit | One common 0 V, or as the datasheet says |
| **6. Speed** | Compare pulse length with the program cycle | Pulses longer than the cycle, or interrupt or counter input |

## What the readings tell you

- **LED changes, input voltage does not:** NPN sensor on an input for PNP sensors, or a wrong terminal.
- **Some volts with the sensor off:** leakage of a 2-wire sensor or a floating input.
- **Supply voltage at the input, input off:** common not connected, or input for another voltage range.
- **Input misses pulses:** signal faster than the program cycle: use interrupt or counter.

## If the input has never worked

- On an input for PNP sensors, connect +V to the input with a wire. If it switches, check the sensor and its wiring.
- NPN sensor on a PNP-only input: change the sensor, or use an NPN to PNP converter or an interface relay.
- Check that the program reads the right input. Pin names and switches depend on your PLC range.

Details for your PLC range: industrialshields.com/slides/slide/digital-input-not-reading-npn-or-pnp-step-by-step-937