

SENSOR LOGIC BLOCK

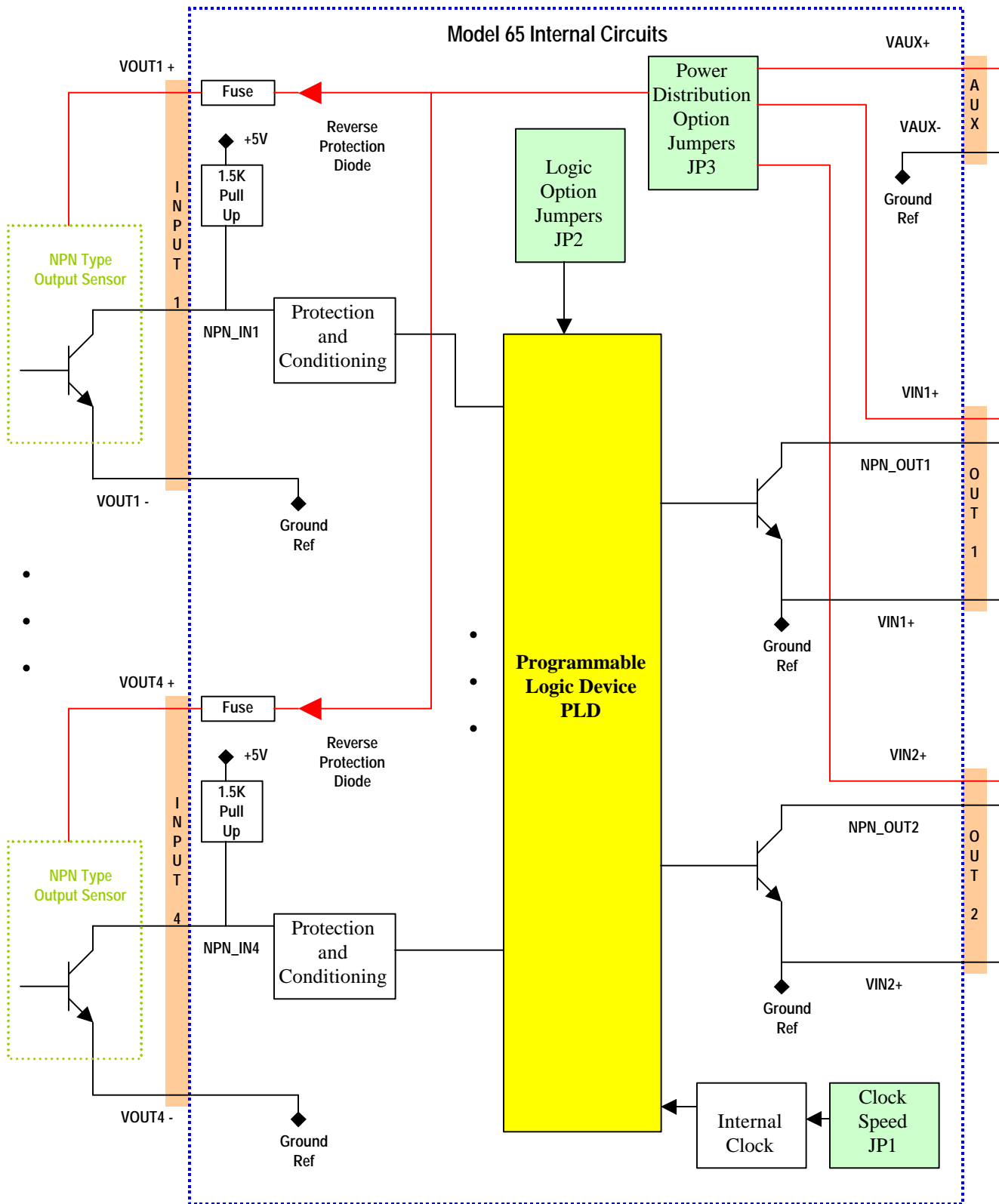
- Accepts four NPN sensor inputs and generates two NPN sensor outputs
- Uses a standard Programmable Logic Device, PLD. Can be programmed by end customer or customized per customer's request.
- Local LEDs provide visual indications of all inputs and outputs as well as power.
- Available in NEMA 4 and DIN Rail mount enclosures.
- Distributes power to input NPN sensors to reduce external wiring. Power is reverse voltage protected and individually fused.
- Electronics operate from a wide input voltage range of 12 to 32 VDC at 100 mA maximum.
- All connections are made via high-quality removable terminal blocks.

**DESCRIPTION**

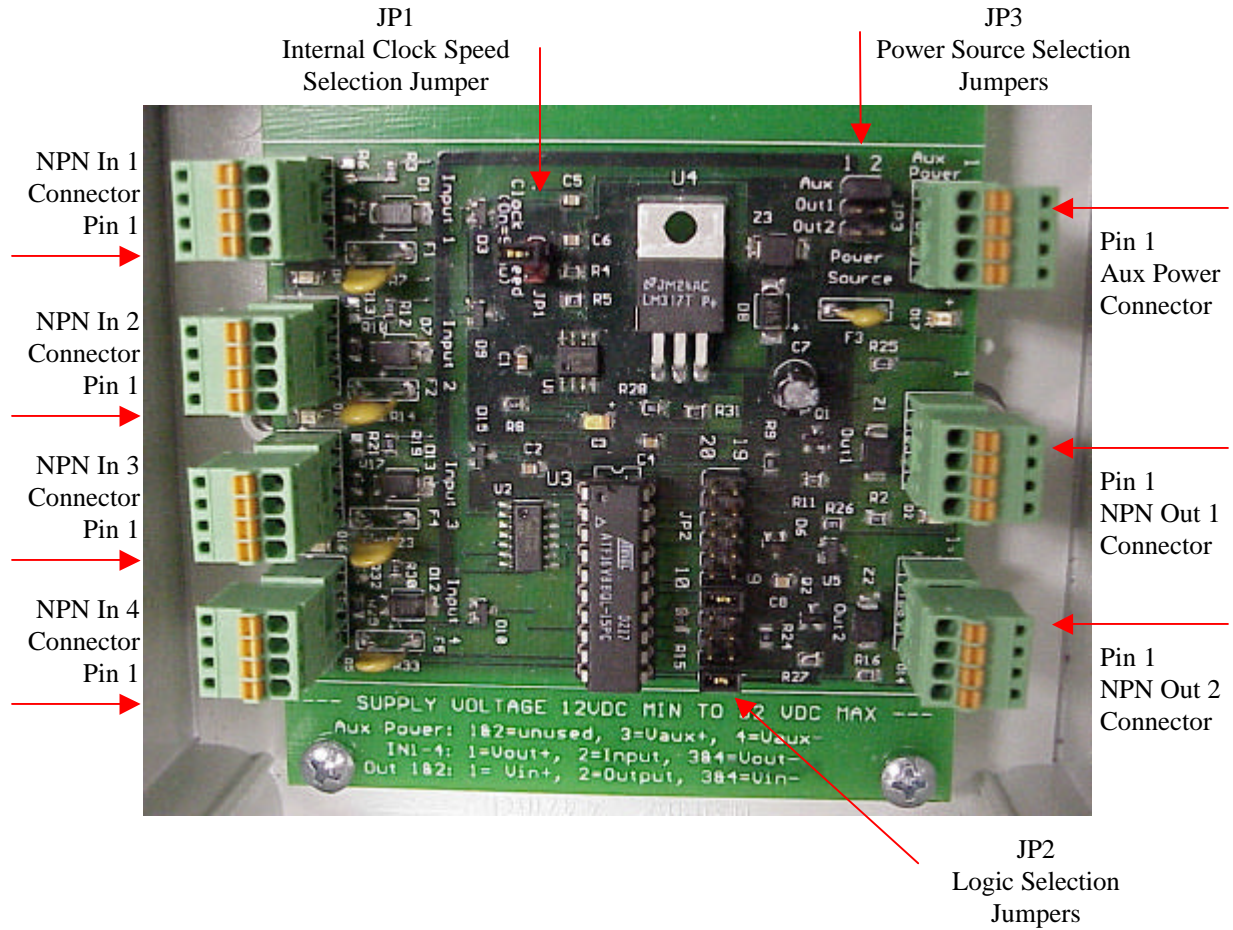
The Model 65 allows logic functions to be performed on standard NPN type industrial sensors. It contains four NPN sensor inputs and provides two NPN sensor outputs. A wide variety of digital logic functions can be performed on the four inputs to generate the two outputs. Logic functions such as AND, OR, EXCLUSIVE-OR can be performed. The logic is performed using a flash Programmable Logic Device, PLD. The supplied flash PLD can actually be erased and re-programmed.

A block diagram of the Model 65 is shown below. Please see the following sections for a description of each of the function blocks.

MODEL 65

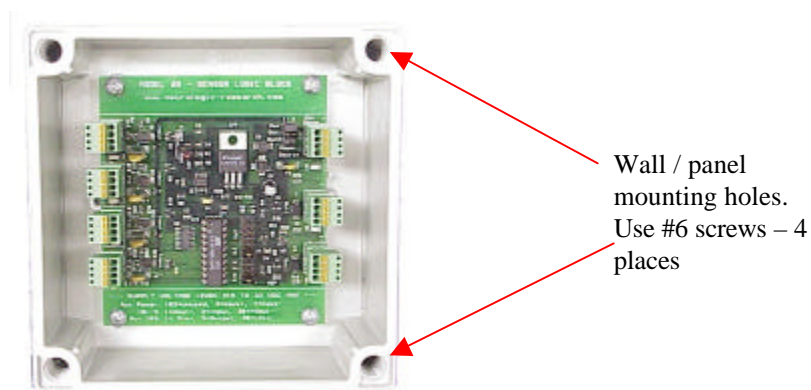


WIRING AND INSTALLATION



Wall / Panel Mounting NEMA 4 Enclosure

The NEMA 4 enclosure can be wall or panel mounted and is appropriate for outdoor environments. To do so, remove the cover. See picture below. Use a #6 screw and drop into mounting holes shown below. Note, mounting holes do not violate the enclosure seal.



MODEL 65

Terminal Block Description

| Aux Power Terminal Block | Connection |
|--------------------------|---|
| 1&2 | No Connection |
| 3 | VAUX+ : Positive end of auxiliary input voltage source. Input range is 12 –32 VDC. This voltage can be used to power the Model 65 electronics and can be routed to the NPN sensor input terminal blocks. Please see the Power Distribution section for details on how to configure using the JP3 jumper block. |
| 4 | VAUX- : Negative connection of auxiliary DC input voltage source. These terminals are connected directly to the electronics ground reference point. |

| IN1 – 4 Terminal Blocks | Connection |
|-------------------------|---|
| 1 | VOUTx+ : Output voltage source to NPN input sensors. This output is controlled by JP3 jumper block. Please see the Power Distribution Section. Each VOUTx+ terminal is individually fused with 100 mA resettable fuse and reverse voltage protected. |
| 2 | NPN_INx : This is the actual input from each of the NPN input sensors. There is a 1.5K-Ohm pull-up resistor to +5V on each. |
| 3&4 | VOUTx- : Negative connection of output DC voltage source. This terminal is connected directly the electronics ground reference point. |

| OUT 1 & 2 Terminal Blocks | Connection |
|---------------------------|---|
| 1 | VINx+ : Input voltage source for each of the NPN outputs. One of these inputs or the VAUX+ output can be used to power the electronics as well as used to power the four NPN sensor inputs. Jumper JP3 controls this option. Please see the Power Distribution Section |
| 2 | NPN_OUTx : NPN output. Each output can handle up to 32 VDC and sink up to 75 mA. |
| 3&4 | VINx- : Negative connection of input voltage source. This terminal is connected directly to the electronics ground reference point. |

Power Distribution and JP3 Jumpers

The Model 65 is designed to simplify system wiring. Usually a single industrial NPN sensor is connected directly into a controller or an event counter. The NPN sensor receives power from the controller and activates its NPN output to indicate the presence of a particular event.

To make integration easier, the Model 65 assumes power can be available on either of its two NPN outputs. Additionally, a separate auxiliary power connector is made available in case sufficient power is not available at the Output Connectors. The JP3 jumper allows the user to select the power source for the Model 65 electronics and the NPN input sensors. Power to each NPN input sensor is reverse voltage protected and fused. Fuses reset when the fault condition is removed and do not need to be replaced. The table below describes the JP3 jumper function. Please see the above photo for location on the printed circuit board.

| JP3 Pins | Label | Description |
|----------|-------|---|
| 1-2 | Aux | Power from Aux Power Connector is routed to NPN Inputs and to local electronics |
| 3-4 | Out1 | Power from Out1 Connector is routed to NPN Inputs and to local electronics |
| 5-6 | Out 2 | Power from Out2 Connector is routed to NPN Inputs and to local electronics |

NPN Inputs

There are four NPN inputs on the Model 65. Each NPN input has a 1.5K-Ohm resistor pull-up to +5 VDC. The input is buffered and has over-voltage and over current protection. The inputs are wired into the terminal blocks labeled Input1- 4. See the Terminal Block Description Section for details.

NPN Outputs

The NPN Outputs are the result of the logic performed on the NPN inputs by the Programmable Logic Device. Please see the block diagram. Please see the Terminal Block Description Section for details.

Clocking, JP1 and JP2 Jumpers

The Programmable Logic Device in the Model 65 is clocked to provide a clean and predictable processing of the inputs. The clocking essentially takes a snapshot of the inputs before performing the logic function on them. The inputs and outputs of the PLD are stabilized for one clock period. This eliminates glitches and transients on the outputs.

By default, the internal clock has a period of 120 milliseconds with JP1 off. Installing the jumper on JP1 causes the internal clock to change its period to about 11 milliseconds.

An external clock can also be used. If a jumper is installed across JP2 pins 19 and 20, the internal clock will be ignored and NPN Input 4 will be used to clock the logic on the PLD. Please see the Logic Options Jumpers Section for details on JP2.

Logic Options Jumpers JP2

The PLD device actually performs the logic functions on the four NPN Inputs and several of the jumper positions on JP2. JP2 is a 2 x 10 jumper block. Please see the photo of the Model 65 PCB and locate JP2 on it. You will see that JP2 pins are numbered from bottom to top. Pins on the left have even numbers while pins on the right have odd numbers. The pin numbers start with 1-2 on the bottom and go up to 19-20 on top. A jumper position is defined as an even and an odd pin number. For example placing a jumper across pins 1 and 2 places a jumper on the first position of JP2.

The first nine jumper positions actually provide inputs directly into the PLD. Those inputs can be used to create a single PLD that has options that are field selectable. The tenth position, pins 19-20, if installed, allows the PLD logic clock to be driven by NPN Input 4.

The following is the jumper configuration for Version A of the PLD logic. It also describes the functions performed by PLD Version A. Essentially Version A provides a way to control Output 1 based on some logic functions on Inputs 1 and 2. Output 2 is controlled by logic functions on Inputs 3 and 4.

MODEL 65

| JP3 Position | Jumper Across Pins | Function for PLD Version A |
|--------------|--------------------|---|
| 1 | 1-2 | These two jumper positions work together as follows: 1-2=Off and 3-4=Off: Out 1 is on if Input 1 OR Input 2 is on. 1-2=On, 3-4=Off: Out 1 is on if Input 1 AND Input 2 is on. 1-2=Off, 3-4=On: Out 1 is an Exclusive-OR of Input 1 and Input2. 1-2=On, 3-4=On: Not used, undefined |
| 2 | 3-4 | |
| 3 | 5-6 | Not used |
| 4 | 7-8 | Not used |
| 5 | 9-10 | These two jumper positions work together as follows: 9-10=Off and 11-12=Off: Out 2 is on if Input 3 OR Input 4 is on. 9-10=On, 11-12=Off: Out 2 is on if Input 3 AND Input 4 are on. 9-10=Off, 11-12=On: Out 2 is an Exclusive-OR of Input 3 and Input 4. 9-10=On, 11-12=On: Not used, undefined |
| 6 | 11-12 | |
| 7 | 13-14 | Not used |
| 8 | 15-16 | Used |
| 9 | 18-17 | Not Used |
| 10 | 19-20 | If installed, the logic clock used is NPN input 4. If installed and no transitions occur on NPN input 4, the PLD will essentially retain the current NPN output value forever and ignore all other NPN inputs. For the most part, this jumper should not be installed for PLD Version A. |

Low Voltage Detect

The Model 65 electronics has a low voltage detect circuit that will de-activate both NPN outputs if the regulated voltage drops below the minimum operating voltage of the electronics.

Custom PLD Programming

Based on customer request, we can reprogram the equations into the PLD to perform different functions. Also, a customer with the right tools can program the PLD at their facility. The PLD is installed in a socket and can be unplugged and replaced or re-programmed. Please contact the factory for other functions or information needed to program the PLD.

GENERAL SPECIFICATIONS

NPN Input

| | |
|--|--|
| | |
|--|--|

NPN Output

| | |
|------------|---|
| NPN Output | 32 VDC maximum NPN collector voltage at 75 mA maximum |
| | |

Electronics

| | |
|------------------------|--|
| Operating Environment | -40 to 85C, 0-95% RH non-condensing |
| Input Power Protection | |
| Terminal Blocks | Screw-less, removable terminal blocks. Accepts up to 20 GA wire. |

Dimension and Materials

| | |
|---|---|
| DIN Rail Enclosure's external Dimension | 71 mm (2.8") W x 90 mm (3.54") L x 58 mm (2.28") H |
| DIN Rail Enclosure's Material | Grey frame retardant Noryl UL94 |
| NEMA 4 Enclosure's external Dimension | 130 mm (5.12") W x 130 mm (5.12") L x 60 mm (2.36") H |
| NEMA 4 Enclosure's Material | Grey polycarbonate with translucent polycarbonate cover. Frame retardant UL94 |

ORDERING INFORMATION

| | | | |
|-------------|------------------------------------|--|--|
| 0065 | Model 65 Sensor Logic Block | | |
|-------------|------------------------------------|--|--|

| Code | Enclosure Options |
|------|---------------------------------|
| -0 | NEMA 4X with ½" NPT conduit hub |
| -1 | DIN-Rail Mount |

| Code | Logic Options |
|------|-------------------|
| -A | A Logic Functions |

| | | | |
|-------------|-----------|-----------|---|
| 0065 | -1 | -A | Model 65 Sensor Logic Block in DIN Rail enclosure, A Logic functions |
|-------------|-----------|-----------|---|

ASSOCIATE PRODUCTS

Model 2200 2-Channel Pulse Count Input Network Node

Model 60 AC Voltage Detector