SLATE™ INTEGRATED COMBUSTION MANAGEMENT

Digital I/O Module Monitored Relays

Whitepaper

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So what is the difference between monitored and unmonitored relay outputs? The unmonitored relay output (K1) is a simple dry contact. It is commanded to open or close by the wire sheet as needed, but that is about its limit. The application for such a relay is usually relatively straight forward and is generally not part of a critical function in the sequence.

But what if the function is more "critical" in nature and the designer would like to program some auxiliary conditions (besides its sequential order in the wire sheet) such as the presence/absence of voltage on one of the relay terminals? It may be required to alert the operator that a particular relay and therefore a particular function has failed.

Relays K2-K6 on the Digital I/O Module are opto-isolated and each of their terminals are monitored. This means the designer can choose to use the existence or non-existence of voltage on relay terminals as a condition for opening or closing that relay.

In this example, the application requires that a manual switch controls the demand for the burner to fire, but not before 10 seconds has elapsed after closing the Manual On/Off switch. This scenario uses a monitored relay on a Digital I/O Module to create the timer function.

Wiring:
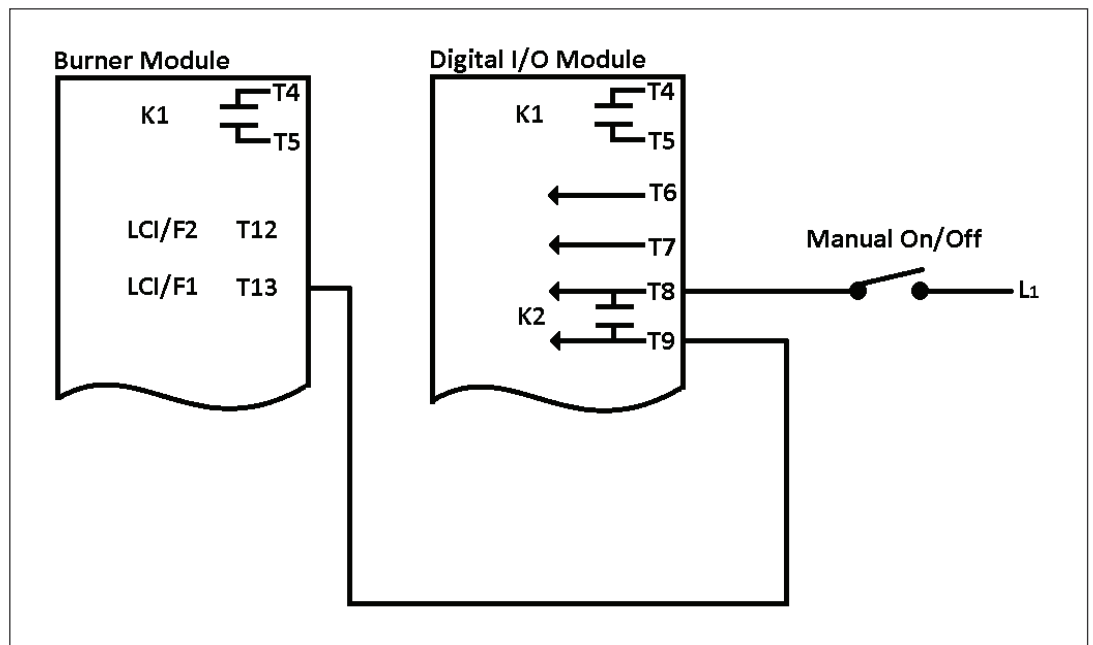
IN THIS INSTANCE THE DEMAND ON THE BURNER MODULE WILL COME VIA T13 (LCI/F1). VOLTAGE IS ROUTED THROUGH K2 OF THE DIGITAL I/O MODULE WHICH IS A MONITORED RELAY.

Wire Sheet:

Here the T8 terminal state register is used for indication of voltage on the terminal. The register will have a value of 1 if there is voltage on the terminal or 0 if there is no voltage on the terminal. The voltage on the T8 terminal must equal Vref on the Digital I/O module (and in this example the Burner Module as well) in order for the register to have a value of 1.

- Drag and drop a Binary Input block from the Physical Points category in the Niagara AX palette. An input block is used because the state of the terminal is entering the wire sheet.

- Name the block (This example uses DIO_Terminal_8_St).

- Configure the block. Remember, we are interested in knowing the state of the terminal (either powered or unpowered).

  - Feature: Line Voltage input. Line Voltage=Vref.

  - Module: Select Digital I/O module since we are interested in its T8 state.

 - Feature: t8:Line voltage input
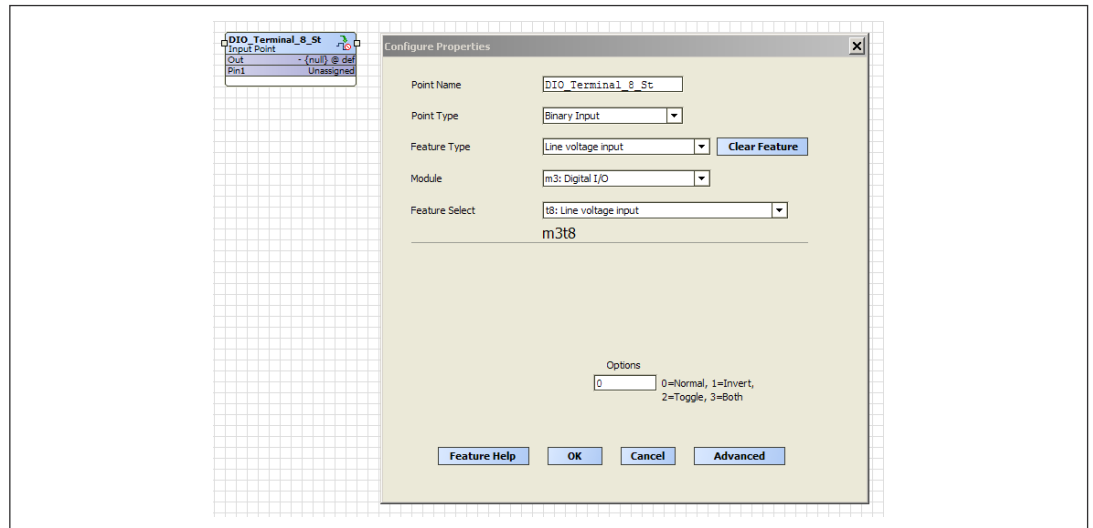
- Link the output of the "DIO_Terminal8_St" block to an OR block (used the OR block for its simple timer function, but could use a "RunTimeAccumulate" block as well) and configure its "true delay" to 10 seconds.
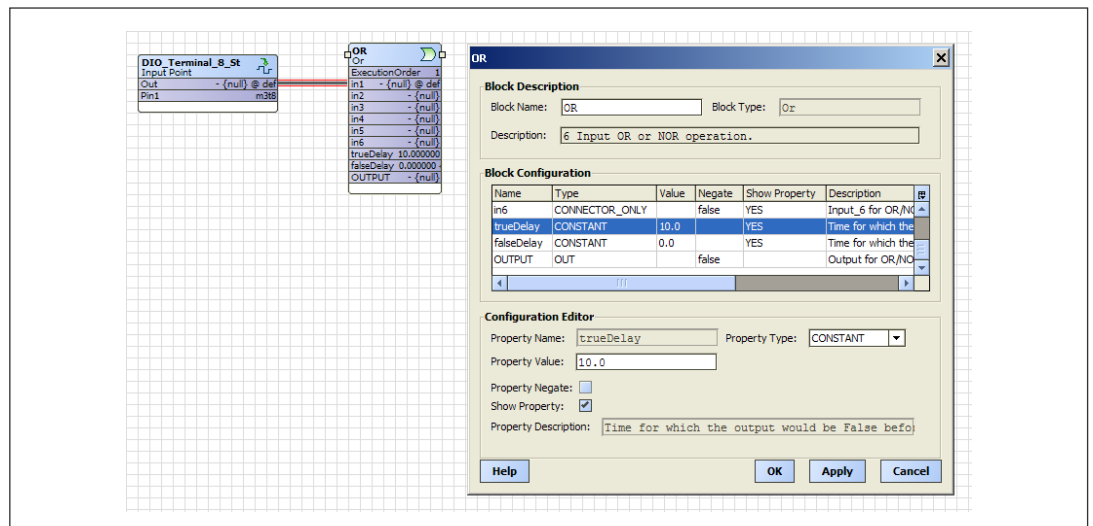
- Next, drag and drop a Binary Output block from the Physical Points category in the palette.

- Name it (This example uses K2_Output).

- Configure the block.

  - Feature: Relay output.

  - Module: Digital I/O.

  - Feature: k2: Relay output t8,t9.
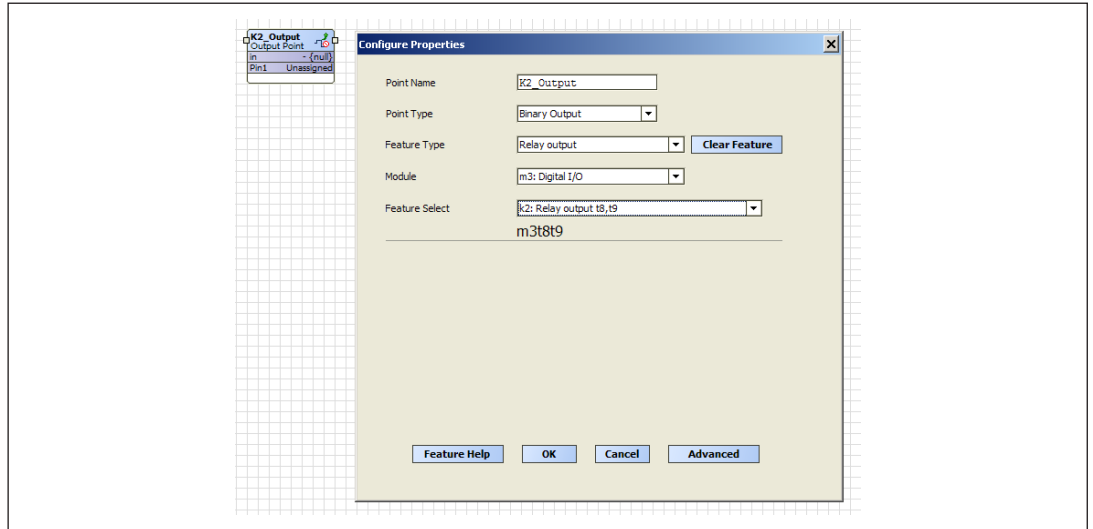
- Link the output of the "OR" block to the "K2_Output". The "OR" block will send a value of 0/1 (open/close) to the Digital I/O module K2 relay 10 seconds after the Manual On/Off switch is closed and voltage is present on T8 of the Digital I/O module.
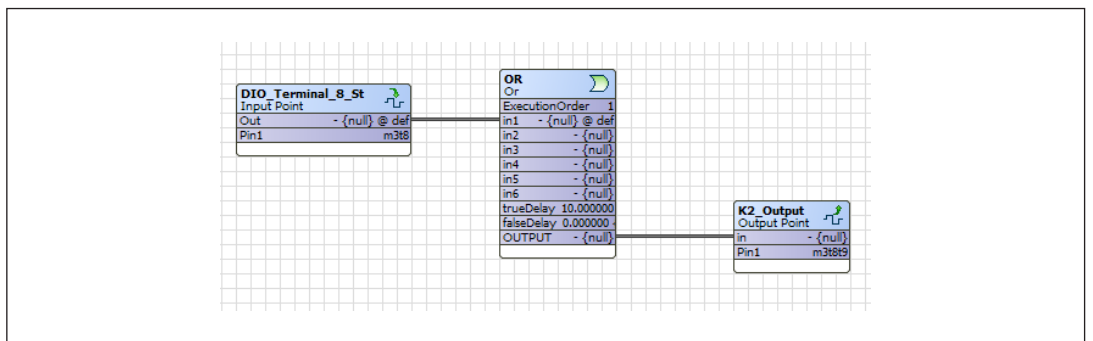
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