
AbioCard

Connecting the Outputs of the I/O Expander

Technical Note – 001

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Revision History

Date	Authors	Description
2013-01-30	Peter S'heeren	Initial release.

1 Overview

The AbioCard incorporates the NXP PCF8574 chip which provides 8 quasi-bidirectional I/O pins. The I/O pins are routed to pins 1-8 of connector K4.

Software can set each pin to the HIGH or LOW state. For each I/O pin, the following electrical limits apply:

- When HIGH, an I/O pin can source 300 μ A.
- When LOW, an I/O pin can sink 25 mA.

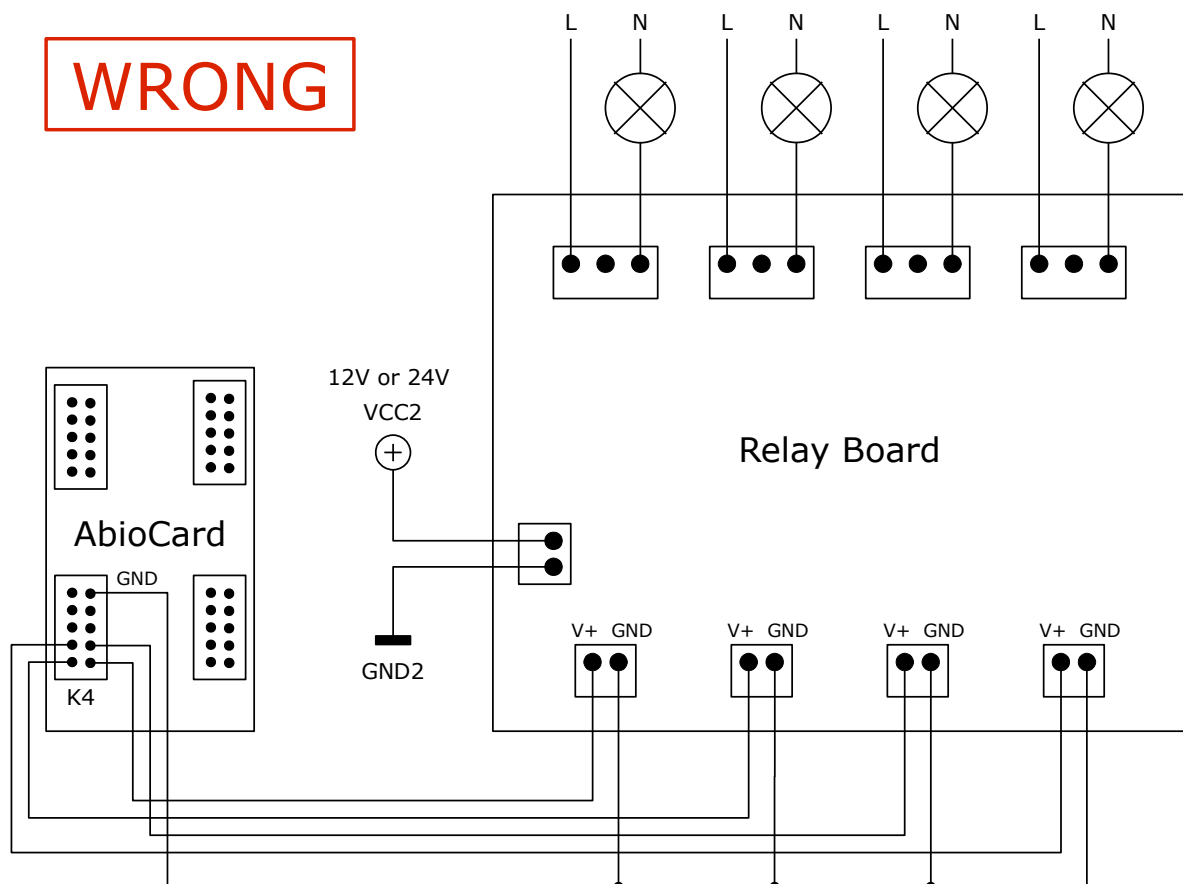
If an I/O pin is to drive an optocoupler or an LED, then 300 μ A won't suffice. Using the I/O pin as a source to ground thus won't work, instead it must sink from VCC.

Example

In this example let's connect a 4-channel relay card to I/O pins 1-4 of connector K4 on the AbioCard. The four inputs of the relay card are optocouplers.

The Wrong Way

Connect the I/O pins on the AbioCard with the corresponding V+ pins of the input connectors on the relay card, and tie all GND pins together.

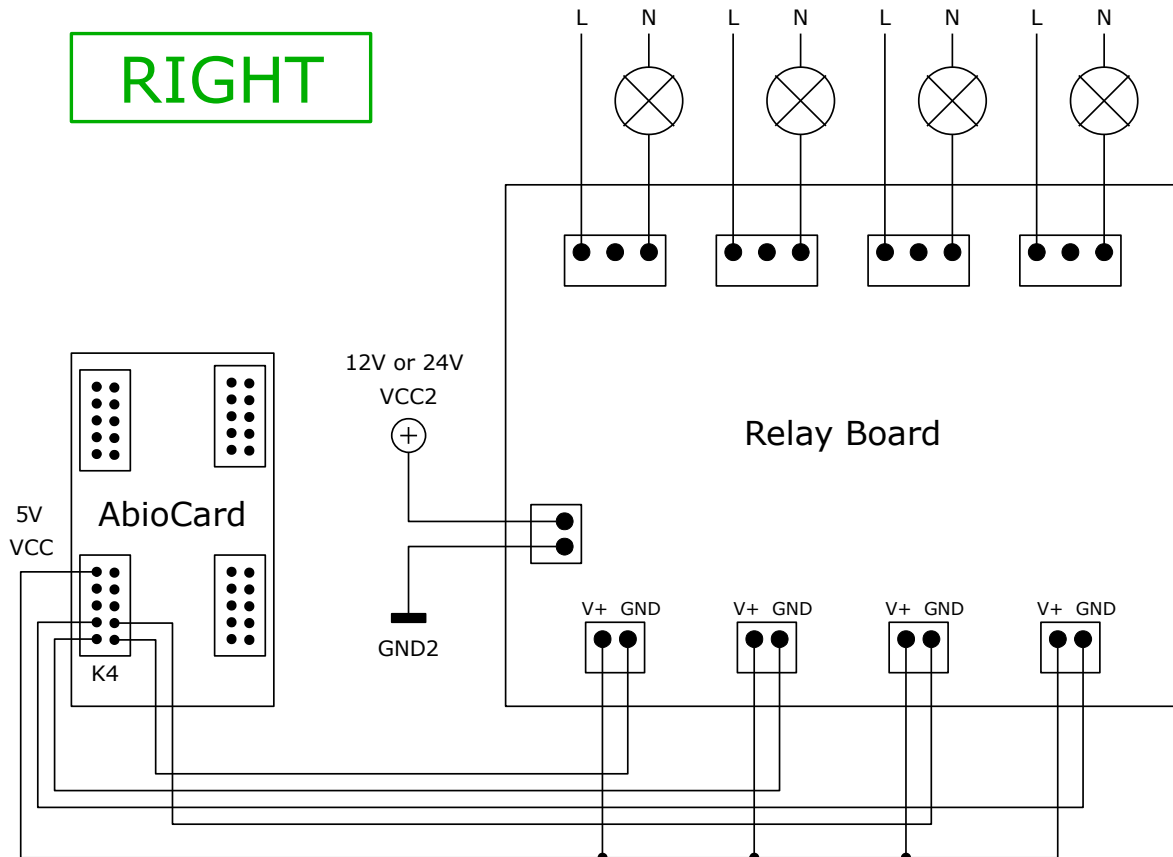


When an I/O pin is set LOW, no current will flow through the optocoupler. When the I/O

pin is set HIGH, the PCF8574 will be able to source at most 300 μ A which is not enough to activate the optocoupler.

The Right Way

Connect the I/O pins on the AbioCard with the corresponding GND pins of input connectors on the relay card, and tie all V+ pins to the 5V on the AbioCard.



When an I/O pin is set HIGH, no current will flow through the optocoupler. When the I/O pin is set LOW, the PCF8574 will be able to sink 25 mA which suffices to activate the optocoupler.

From a software point-of-view, the I/O pins use negative logic. When software sets an I/O pin to logic zero, the pin is set to LOW and the optocoupler is activated. When software sets an I/O pin to logic one, the pin assumes the HIGH state and the optocoupler is deactivated.

If you're using the **abiocardgui** program to control your AbioCard, you can turn on the inverse logic checkbox to enable positive logic in the user interface while the I/O pins use negative logic.

