Application Note: Monitoring Redundant Power Supplies

Introduction

Server farms often require remote monitoring independent of the servers themselves. Thus, if a server goes down, the redundant monitor function allows a technician to remotely diagnose a problem and take appropriate action. A need was identified in a server farm to monitor and control a number of redundant power supplies powering the servers.

Background

The power supplies used in this application include a TTL output that indicates the supply is operating within normal ranges, as well as an input that can be used to shut down the supply.

From the power supply specification:

It is possible to configure these alarm lines to allow multiple power supplies to provide a failure indication using the N.O. (close on failure) lines, N.C (open on failure) lines, or both. Each alarm circuit can be configured in two ways: either by internal DIP switches or by external wiring of the I/O connector. The alarm circuit must not exceed DIP switch specifications: 100mA, 50V d-c, maximum.

N.O. Alarm Line (Close on Failure)

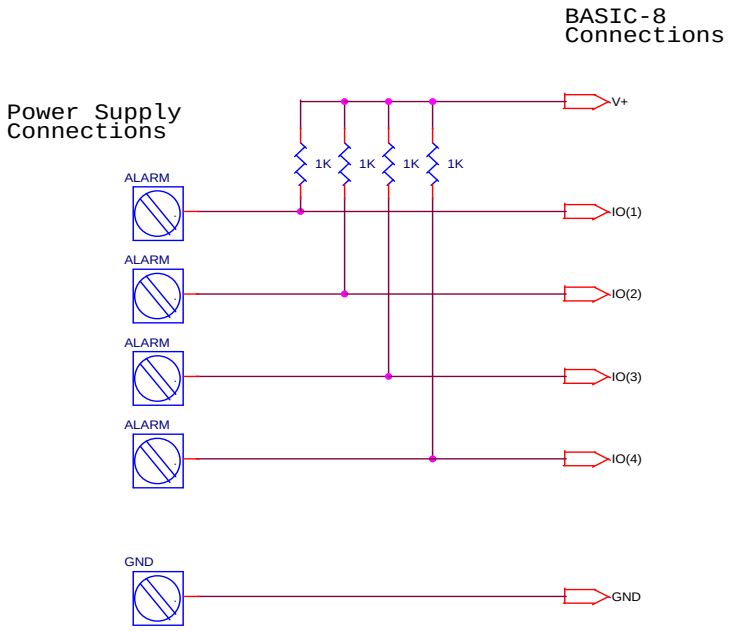
The N.O. and COM line of each supply provide a closed contact (short circuit) upon failure. To configure multiple power supplies so that a failure of any supply produces a failure indication, it is necessary to connect the N.O. lines in parallel and the COM lines in parallel.

N.C. Alarm Line (Open on Failure)

The N.C and COM line of each supply provide an open contact (open circuit) upon failure. To configure multiple power supplies so that a failure of any supply produces a failure indication, it is necessary to connect the N.C. line of one, with the COM line of the next power supply, so the alarm line is connected in series.

Connections

The supplies are configured in the N.C. mode so that an open sense wire can also be detected. A pullup resistor is connected to each sense line to pull the line when open up to 5V through a 1K resistor.



Control Code

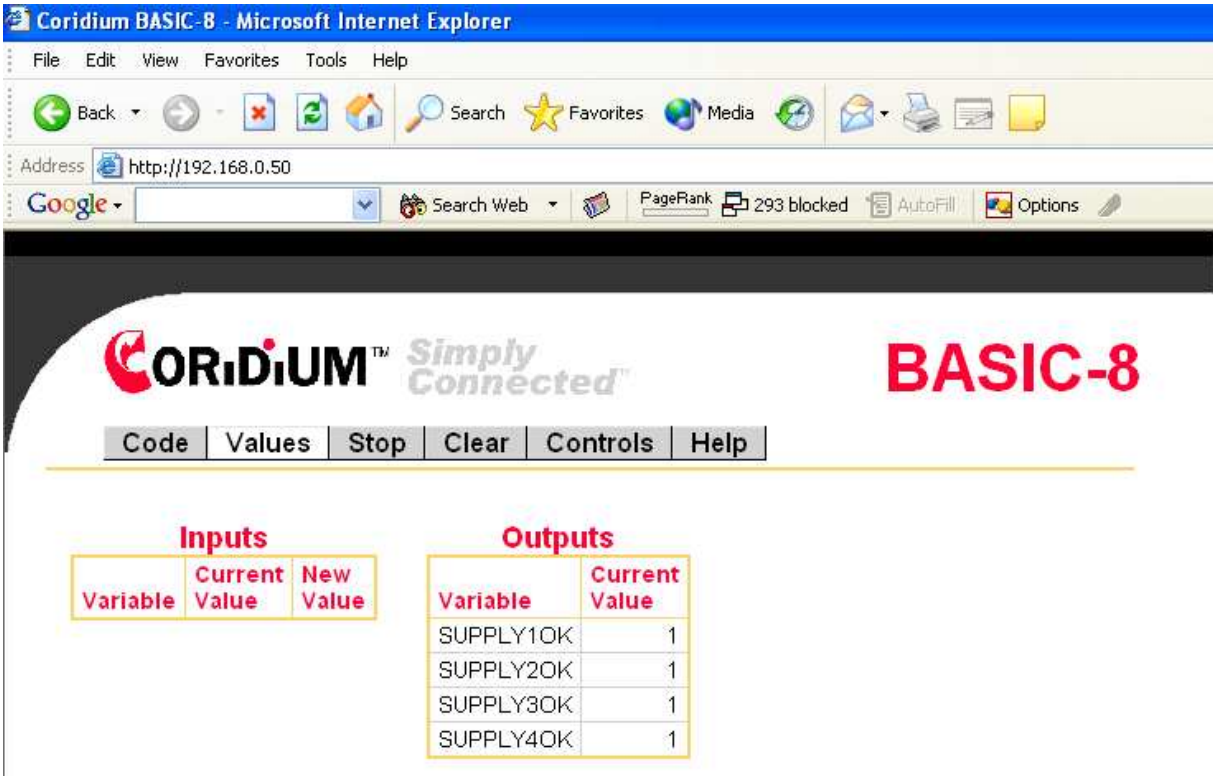
This software monitors the alarm lines of the power supplies and posts the status on a web page. The code is entered via the web browser interface of the BASIC-8. No other development tools are required.

```
web readonly Supply1OK
web readonly Supply2OK
web readonly Supply3OK
web readonly Supply4OK

while 1
      Supply1OK = not IO(1)
      Supply2OK = not IO(2)
      Supply3OK = not IO(3)
      Supply4OK = not IO(4)
      wait (100)  ‘ no need to update more often and
                  ‘ this makes webpage refresh quicker
loop
```

Web Page Results

The power supplies can now be monitored remotely on an independent server on the Values page of the BASIC-8:



Conclusion

The BASIC-8 controller simplifies the development of remote monitoring and control applications. An application like this would normally take several days to develop on a typical embedded development platform. The BASIC-8 made it possible to develop and deploy this application in just a few minutes. Maintenance overhead is significantly reduced because the development system is embedded in the controller, eliminating the need to purchase, upgrade, and archive development tools.

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BASIC-8
Controller Kit

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