The ccb_monitor_status program.

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Abstract

This document describes a program that, in its usual guise as a daemon, running on the CCB computers, has the task of making the front-panel status-LEDs of the CCB reflect the overall status of the CCB. It is also used at boot time, to query the ID of the instrument-cable that is connected to the CCB, so that an appropriate IP address can be assigned to the computer. Finally, it can also be used interactively to print out monitoring values to the terminal.

Contents

Chapter 1

Introduction

The ccb_monitor_status program interacts with the general-purpose I/O (GPIO) card that is plugged into the PC104 ISA-bus of the host CCB computer. Using this card, it reads out instrument monitoring values, such as power-supply voltages, and uses these values to determine the states of the status-LEDs on the front-panel of the CCB. It can also print out these values to a terminal, when called interactively. It is called as follows:

1.1 Running the ccb_monitor_status program

```
  ccb_monitor_status [-repeat <n>] [-delay <seconds>]
                     [-show <all|nothing|id>] [-daemon]
```

Note that in the above, where square-brackets enclose an argument, this denotes that that argument is optional. Similarly, where angle-brackets enclose an argument, this means that the argument's value is variable. A sequence of words separated by "|" characters, lists the legal literal values of an argument.

The above arguments are described as follows:

- `-repeat <n>`

  The ccb_monitor_status program operates a loop that reads the latest CCB status values from the GPIO card, updates the front-panel status LEDs of the CCB, and, unless told not to, displays the monitored values on the terminal. By default the program exits after performing this procedure once, but the -repeat argument can be used to specify a different number of times that it should repeat the procedure. The special value of 0 (*ie.* zero), tells the program to repeat the procedure indefinitely.

Note that when the program is told to run as a daemon, (see below), the `-repeat` argument is ignored, and the program acts as though the repeat count had been specified as 0. Thus the program runs indefinitely.

- `-delay <seconds>`

  When the `-repeat <n>` argument has been used to specify that the program should run its monitoring loop more than once, the `-delay <seconds>` argument can be used to specify how long the program should wait between performing subsequent iterations. Its argument is interpreted as an integer number of seconds. The default delay, which is used when this argument is not specified, is 1 second.

- `-show <all|nothing|id>`

  When not running as a daemon, this argument specifies whether to print any monitoring values to the terminal, and if so, which ones. Its possible values are interpreted as follows:

  all Display all monitoring values to the terminal.

  nothing Don't display any monitoring values to the terminal. This option is usually used when the program is being used to keep the front-panel LEDs up to date.

  id Display nothing but the ID of the instrument-cable that is plugged into the front-panel of the CCB. This is used at boot-time to dynamically choose the IP address of the CCB computer to match the identity of the receiver that it is connected to.

  This argument is ignored when the program is being run as a daemon, and the program behaves as though its value had been specified as nothing.

- `-daemon`

  When this argument is present, the ccb_monitor_status program re-runs itself as a detached background daemon, which runs indefinitely, without printing anything to any terminal. This is the mode in which the program is started at boot time. In this mode, the only visible effect of the program is its control of the front-panel status-LEDs.

1.2 Interpreting the front-panel status-LEDs

1.2.1 The POWER-OK LED

When the POWER-OK front-panel LED is lit, this means that the voltages of all of the CCB power-supplies are within their nominal ranges.

The lower and upper limits of these voltage ranges are as follows:

Power-supply	Minimum	Maximum
Global Fan 12V	11.4V	12.6V
Global Analog 8V	7.6V	8.4V
Global Digital 5V	4.75V	5.25V
Per-board digital 1.2V	1.14V	1.26V
Per-board digital 2.5V	2.375V	2.625V
Per-board digital 3.3V	3.3V	3.465V
Per-board analog 5V	4.75V	5.25V

1.2.2 The SYSTEM-OK LED

When the SYSTEM-OK front-panel LED is lit, this means that the mean heartbeat voltage from all of the master and slave FPGAs are within their nominal values. The limiting voltages are as follows:

	Minimum	Maximum
Mean heartbeat voltage	1.32V	1.98V

1.2.3 The FPGA DONE LEDs

There is one FPGA-DONE LED per CCB board, with the master-FPGA board being represented by the LED that is labeled “FPGA 0 DONE”. When the LED of a particular board is lit, this means that the FPGA on that board has had firmware downloaded into it.

1.2.4 The FPGA ERROR LEDs

Again, there is one FPGA-ERROR LED per CCB board, with the master-FPGA board being represented by the LED that is labeled “FPGA 0 ERROR”. When the LED of a particular board is lit, this means that the firmware of the board’s FPGA either hasn’t been loaded, or that the checksum of the downloaded firmware is inconsistent.

1.2.5 Other LEDs

The remaining front-panel LEDs are either directly connected to the electronics that they represent, or are controlled by the CCB server, according to the current operating mode of the CCB.